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C O N T E N T S

The Problems of Contemporary Education

The History of Education

**Visualization in Basic Science and Engineering Education:
Call for Manuscripts for a Special Issue**

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Dear Colleagues,

It is well known that **the main aim of visualization is to make invisible things visible**. Visualization through visual imagery has been an effective way to communicate both abstract and concrete ideas since the dawn of mankind. Historical examples of this concept include cave paintings, Egyptian hieroglyphs, Greek geometry, antique mosaics and Leonardo da Vinci's revolutionary approaches to technical drawing, for engineering and scientific purposes.

The invention of computer graphics played the most important role in the development of scientific visualization and, as a result, influenced all levels of modern education. Educational visualization entails using a simulation, in order to create an image of a model or a process, so that it can be easily taught and explained. This is very useful when teaching a topic that is difficult to provide visual reference to, such as atomic structure, distribution or variation of temperatures in the human body, Gaussian curvature of a surface (Fig. 1), zebra stripes on a composite surface (Fig. 2) and many other scientific and engineering-related problems. Educational visualization rapidly enriches the field of educational technology, which consists of both theory and ethical practice in the educational process, across different sectors.

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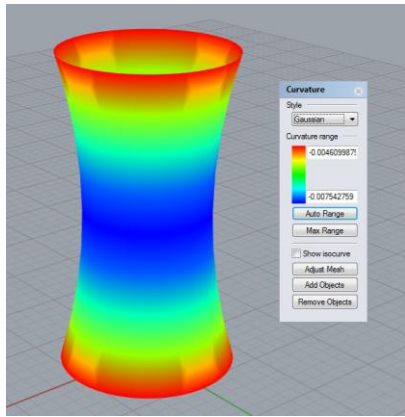
Fig. 1. Gaussian curvature of a surface created by a revolving NURBS curve.
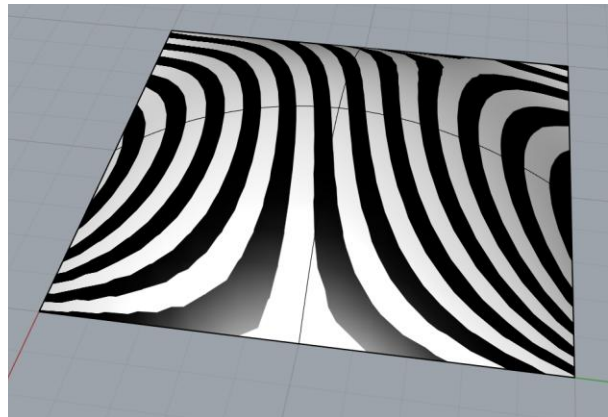
Fig. 2. Zebra stripes are used for checking the quality of a composite polynomial surface.

Considering the importance of the aforementioned statements in contemporary education and, as the editor of the **European Journal of Contemporary Education** (e-ISSN 2305-6746, website: http://ejournal1.com/en/index.html), I would like to invite you to submit your manuscripts for the special issue, entitled **"Visualization in Basic Science and Engineering Education"**. The special issue will cover the topics related to educational visualization and its applications in basic science and engineering education. Special focus will be placed on the works in which educational visualizations were developed by modern programming languages and computer algebra systems.

Author(s) who are interested in the aforementioned topics are requested to consider the following important guidelines:

• Individual papers should not be less than 5000 words and should not exceed 10 000 words, should be approximately 25–35 double-spaced, typewritten pages, including abstract, tables, figures, endnotes and excluding references.

• The author's/authors' full name[s]/affiliation[s] with a full postal address including a postcode, should be enclosed.

• The abstract of 200-250 words should consider the purpose of the paper, method, literature, and expected specific and unique contributions for university professors, teachers, young educators and students, as well as the field of education in general.

• Author(s) should propose at least three peer reviewers and their names, affiliations and contacts.

• The manuscript should be carefully copy-edited by a native speaker who is a professional in the field of science or engineering education. The proof thereof, or the copy-editing certificate, should be submitted at the final stage after the required revisions have been made.

• **All accepted manuscripts will be published without any charges.**

• All manuscripts will be scheduled and the timeline will be as given below:

- full-length manuscripts should be submitted only within the period from **October 1, 2018 to October 7, 2018**. Please use both ziatdinov.rushan@gmail.com and ziatdinov@kmu.ac.kr for manuscript submission.

- deadline for sending papers to peer-reviewers or rejecting a manuscript is **November 1, 2018**.

- deadline for receiving reviewers' comments is **December 15, 2018.**

- Guest Editor's decisions will be sent to the authors before **January 1, 2019.**

- deadline for receiving revised versions is **February 10, 2019**.

- the publication of the special issue will occur on **March 31, 2019.**

All submitted manuscripts must be original, not under consideration elsewhere, and not previously published.

The Guest Editor reserves the right to refer any single paper for alternative or additional peer assessment, and to refuse any papers that are not recommended for publication by alternate reviewer(s).

The Guest Editor is responsible for overseeing the double blind review and revision process. This includes selecting and contacting independent peer reviewers (at least two 'blind' reviews per paper), assessing reviewers' comments, forwarding comments to the authors and requesting they revise their paper (taking into consideration the comments), and reviewing the revised papers and the author's responses to how the review comments were addressed.

The EJCE provides equal opportunities for academics, researchers and scholars who work in different countries. The EJCE has been included in the Web of Science Core Collection (ESCI) since December 2015, in Scopus since March 2016 and listed in many other indices and databases, such as ERIC, EBSCO, etc.

Short biography of the Guest Editor

Rushan Ziatdinov is a native Tatar from Russia, and is a faculty member at the Department of Industrial Engineering at Keimyung University, Daegu, Republic of Korea. He obtained his MS degree in the area of mathematical methods in economics from the Kama State Institute of Polytechnics (currently the part of Kazan Federal University) in Russia, and has a PhD degree in mathematical modelling from Ulyanovsk State University in Russia. In the beginning of his scientific career, he held the positions of Assistant Professor in the Department of Geometry and Mathematical Modelling at Tatar State University of Humanities and Education, and also in the Department of Special Mathematics at Tupolev Kazan National Research Technical University (Kazan University of Aviation), Kazan, Russia. He then moved to Seoul National University in the Republic of Korea, where he was a postdoctoral researcher in the Computer-Aided Design and Information Technology Lab of the Department of Naval Architecture and Ocean Engineering. From 2011–2015 he was a faculty member in Istanbul, Turkey. His research interests are broad and include computer-aided geometric design, CAD/CAM, aesthetic shape modelling, the use of computer models in science and engineering, instructional technologies and mathematical modelling. Professor Ziatdinov is an editor of several engineering and educational journals, as well as the author of a series of manuscripts published in top journals.
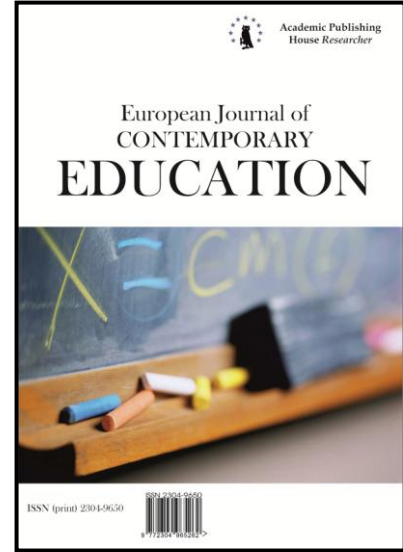
The Problems of Contemporary Education

The Relationships between Positive and Negative Perfectionisms, Self-Handicapping, Self-Efficacy and Academic Achievement

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Abstract

This research aimed to investigate the relationships between positive and negative perfectionisms, self-handicapping, self-efficacy and academic achievement. For this purpose, an extensive literature review was conducted and a model was suggested. Structural equation model was employed to test the model. The study group of the research consisted of 350 students studying at the Faculty of Muallim Rıfat Education at Kilis 7 Aralık University. The data was collected through positive and negative perfectionism scale, self-handicapping scale, self-efficacy scale and personal information form. Descriptive, correlation, path and bootstrap methods were used to analyze the data. As a result of the data analysis, it was revealed that students' positive perfectionism have a significant positive effect on their academic achievement and self-efficacy, while they have a significant negative effect on their self-handicapping. Besides, it was found that the negative perfectionism have a significant negative effect on their academic achievement and self-efficacy, and a significant positive effect on self-handicapping. Lastly, it was seen that self-efficacy and self-handicapping play partial mediation roles in the relationship between positive and negative perfectionism and academic achievement. Based on this result, it can be stated that positive and negative perfectionisms are significant variables which have direct and indirect effects on academic achievement.

Keywords: positive and negative perfectionisms, self-handicapping, self-efficacy and academic achievement.

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1. Introduction

Academic achievement significantly determines the future for educational and professional achievement (Flashman, 2012) and plays a crucial role in training qualified human resource who can be effective in the economic and social development of a nation (Ali et al., 2009). Academic achievement provides information about the effectiveness and efficiency of educational institutions and to what extent they fulfill their objectives. Academic achievement not only gives information about schools' effective levels but also shapes the future of a nation, particularly youth (Aremu, Sokan, 2002). Therefore, educators and researchers have been interested in determining the factors affecting academic achievement for a long time (Crosnoe et al., 2004) and within this scope, a number of researches have been conducted. The researches indicate that many factors concerning student, teacher and school influence students' academic achievement (Vishalakshi, Yeshodara, 2012). Some of these factors are socio-economic status (Tomul, Savasci, 2012; Ahmar, Anvar, 2013; Ghaemi, Yazdanpanah, 2014; Çiftçi, Çağlar, 2014), self-respect (Aryana, 2010; Booth, Gerard, 2011; Rahmani, 2011), motivation (Firouznia et al., 2009; Amrai et al., 2011; Martin, Steinbeck, 2017), learning and studying approach (Chung, Yip, 2002), friends (Ding, Lehrer, 2007), self-efficacy (Motlagh et al., 2011; Turner et al., 2009; Li, 2012), self-handicapping (Kalyon et al., 2016; Urdan et al., 1998; Javanmard et al., 2012) and perfectionism (Witcher et al., 2007; Stoeber, Rambow, 2007; Soleymania, Rekabdar, 2010). It is known that some of these factors positively affect students' academic achievement, while others negatively affect their academic achievement.

The results of the researches conducted in this context indicate that one of the variables affecting students' academic achievement is perfectionism (Witcher et al., 2007; Stoeber, Rambow, 2007; Soleymania, Rekabdar, 2010). Perfectionism is defined as a personality type characterized by different qualifications such as striving for flawlessness and perfectionism (Stoeber, Otto, 2006). Perfectionism comes to existence thorough one's setting high standards for his/her performances or behaviors (Slaney et al., 2001). Perfectionism has been studied and dealt with in different ways by different researchers in history. According to some researchers, perfectionism is one-dimensional characteristic which reveals some psychological and pathologic negative results such as failure, blaming, shame, low sense of self-respect and depression and so forth (Burns, 1980; Hewitt, Dyck, 1986; Pacht, 1984), whereas others argue that it is a multi-dimensional characteristic involving both positive and negative aspects (Hewitt, Flett, 1991; Stoeber, Otto, 2006). According to the approach regarding perfectionism one-dimensional characteristic, perfectionist people set unrealizable high standards for both themselves and others, usually experience the fear of making mistakes and are not satisfied with their achievements (Rimm, 2007). According to the those researchers who consider perfectionism multi-dimensional characteristic, perfectionism has two dimensions, namely adaptive and maladaptive ones (Parker, 2000; Silverman, 2007). Adaptive perfectionism involves setting personal standards at high level and realizable and attainable goals, being satisfied with achievements and happy to realize the determined goals, fulfilling duties appropriately and on time, accepting mistakes, resetting achievement standards under certain circumstances and making the best of everything. On the other hand, maladaptive perfectionism includes setting unrealizable goals, one's anxiety to make mistakes, fear of being criticized by others and the anxiety for the derived consistencies between the determined standards and achieved results (Stoeber, Otto, 2006; Geranmayepour, Besharat, 2010). Those adaptive perfectionists have significant ability to adapt. If they fail to reach their determined goal, they either change it or work hard to overcome their failure (Haase et al., 2002). In this regard, positive perfectionism enables individuals to get positive results, whereas negative perfectionism causes them to encounter negative results such as uneasiness and strain (Tziner, Tanami, 2013). The researches reveal that those maladaptive perfectionists experience more negative psychological problems such as depression and anxiety, and have lower sense of self-confidence and self-efficacy, make more self-criticism regardless of succeeding or failing, are not satisfied with their achievement as opposed to those adaptive perfectionists who have higher sense of self-respect and self-efficacy, are more satisfied with their achievements and more embrace their successes and failures (Wang et al., 2007; Zeigler-Hill, Terry, 2007).

Self-handicapping is one of the factors which negatively affects students' academic achievement. Self-handicapping concept was, for the first time, defined by Berglas and Jones (1978). According to Berglas and Jones (1978), self-handicapping is "any action or choice of performance setting that enhances the opportunity to externalize (or excuse) failure and to

internalize (reasonably accept credit for) success". Individuals sometimes avoid success and create barriers affecting their performances negatively to protect or increase their self-esteem. Self-handicapping is a behavior type which is used to decrease one's responsibility for his/her failures to protect his/her self image and public reputation. According to Midgley and Urdan (1995), people actively use self-handicapping strategy to indicate their failures stemming from external conditions rather than the lack of their innate ability when they think to fail. People prefer being seen as victims of external conditions and do not want to be perceived as untalented and unskillful. According to Shepperd and Arkin (1989), individual can employ self-handicapping to protect himself/herself from others' negative evaluations. According to Higgins (1990) and Zuckerman, et al. (1998), the ultimate aim of self-handicapping strategies is to protect or increase one's self-esteem and self-efficacy. This enables him/her to keep positive thinking about himself/herself, though it causes reduction in his/her success after some time and gives harm to his/her self-esteem. McCrea and Hirt (2001) argue that self-handicapping is an effective strategy to protect self-esteem in short term. However, it does harm to self-esteem and intrinsic motivation in long term (Zuckerman, Tsai, 2005). Academic achievement is negatively affected by self-handicapping and the effort to be made for next tasks decreases (McCrea, 2008). In this respect, according to Hirt et al. (1991), self-handicapping represents a mechanism which gives harm to individual. Because self-handicapping encourages people to undertake less responsibility and make less effort and reduces their self-awareness. This causes them to blame external factors for their failures (Zuckerman et al., 1998).

Self-handicapping strategies can be employed in a number of fields such as management, sport and particularly education. The frequent use of these strategies jeopardizes performances and hinders success (McCrea et al., 2012). Self-handicapping behaviors generally appear in procrastinating, making no efforts, illness, shyness, excuses, listening to music in a distracting way, use of drug and alcohol, sleeplessness, spending much time with friends and activities (Schwinger, Stiensmeier-Pelster, 2011; Alesi et al., 2012; Shepperd, Arkin, 1989). Self-handicapping strategies with regard to academic sense typically involve abuse of alcohol and drug, procrastinating and not completing assignments, not reading theoretical course materials, lack of attention in class and studying insufficiently for exams (Schraw et al., 2007; Berglas, Jones, 1978). The researches indicate that academic self-handicapping is associated with different variables including anxiety, stress, depression and fear of failure (Schraw et al., 2007; Sahranç, 2011), extrinsic motivation (Urdan, Midgley, 2001), self-efficacy, life satisfaction and self-acceptance (Kinon, Murray, 2007), low sense of self-respect (Ferrari, 1994), perfectionism (Pulford et al., 2005), focus of control (Akça, 2012), neurotic personality characteristics (Bobo et al., 2013; Conrad, Patry, 2012).

Another effective variable on academic achievement is perceived self-efficacy. It is seen that perceived self-efficacy has a significant effect on students' motivation, performance and academic achievement (Kadivar, 2003; Aarabian et al., 2005). Perceived self-efficacy is defined as determination of course of action which is required to fulfill a goal and beliefs concerning one's capability in implementation (Bandura, 1997). Self-efficacy is regarded the most important component of achievement in Bandura's social learning theory and positive psychology. Perceived self-efficacy is an important factor to conduct successful performance and it has a determining effect on the skills to control affection, thought and behaviors (Halper, Vancouver, 2016). A person's just having knowledge and skills are generally not sufficient to successfully implement a particular work. That person also should have belief and expectation about his/her capability to conduct that work. The researchers demonstrate that those who believe in themselves to fulfill the assigned tasks perform better compared with those who do not believe in themselves (Pajares, 1996; Jackson, 2002). Self-efficacy is one of the most important factors which keeps students' efforts throughout learning process (Bandura et al., 2003). Those students with a high sense of perceived self-efficacy, are inclined to use various cognitive and meta-cognitive learning strategies and more capable to control their motivational beliefs as well (Pintrich, 1999). As a result of this, they score higher points in their lessons and set higher aims for themselves and make more effort and show more patience in their works (Pajares, 2002). In contrast to this, those students with a low sense of self-efficacy generally experience fear of failure and avoid undertaking hard tasks (Bandura, 1997).

In this research, the relationships between positive and negative perfectionisms, self-handicapping, self-efficacy and academic achievement were examined thorough structural equation model (SEM). Tested hypothesizes in the context with this aim as follows:

H_1: Positive perfectionism significantly and positively affects academic achievement.

H_2: Negative perfectionism significantly and negatively affects academic achievement.

H_3: Positive perfectionism significantly and negatively affects self-handicapping.

H_4: Positive perfectionism significantly and positively affects self-efficacy.

H_5: Negative perfectionism significantly and negatively affects self-efficacy.

H_6: Negative perfectionism significantly and positively affects self-handicapping.

H_7: Self-handicapping significantly and negatively affects academic achievement.

H_8: Self-efficacy significantly and positively affects academic achievement.

H_9: Self-efficacy and self-handicapping play mediation role in the relationship between positive perfectionism and academic achievement.

H_{10}: Self-efficacy and self-handicapping play mediation role in the relationship between negative perfectionism and academic achievement.

2. Materials and Method

In this study, relational screening model was used to examine the relationships between positive and negative perfectionisms, self-handicapping, self-efficacy and academic achievement. Relational screening is a research model which aims at determining the existence or degree of joint variation between two or more variables (Karasar, 2006; Cohen et al., 2007). A comprehensive literature review was firstly conducted and a model was suggested based on the data derived from the review (Javanmard et al., 2012; Zuckerman et al., 1998; Aarabian et al., 2005; Stoeber, Rambow, 2007; Witcher et al., 2007; Shaheen, 2013; Lotar, 2005; Ram, 2005; Kadivar, 2003; Kalyon et al., 2016; Urdan et al., 1998). According to this model, positive perfectionism directly and indirectly affects academic achievement through self-efficacy and self-handicapping, whereas negative perfectionism directly and indirectly affects academic achievement through self-efficacy and self-handicapping. The suggested model was analyzed by structural equation model and the relationships between the variables were revealed.

Fig. 1. The suggested model with regard to positive and negative perfectionisms, self-handicapping, self-efficacy and academic achievement.

2.1. Population and Sample

The population of the research comprised of all the students studying at the Faculty of Muallim Rıfat Education at Kilis 7 Aralık University in 2016–2017 academic year. Data collection instrument was sent to all the students studying at the faculty through student automation system and they were asked to fill out the scales and return them to the researcher within one month.

In this context, the data obtained from 350 students who returned the scales to the researcher within one month, were statistically analyzed. 100–150 participants is considered the minimum sample size for conducting SEM (Tinsley, Tinsley, 1987; Ding et al., 1995; Tabachnick, Fidell, 2001). Some researchers consider an even larger sample size for SEM, for example, sample size = 200 (Boomsma, Hoogland, 2001). In this regard, the number of 350 participants is sufficient for this research. The participants were 44.3 % male students and 55.7 female students. 18 %, 15.1 %, 16.3 %, 24.3 % and 26.3 % of the students study in Social Sciences Teaching, Turkish Teaching, Primary School Teaching, Science Teaching, Pre-school Teaching, respectively. 26.6 %, 18 %, 21.4 % and 34 % of the participants are freshman, sophomore, junior and senior students, respectively.

2.2. Data Collection Tools

Positive and negative perfectionism scale, self-handicapping scale, general self-efficacy scale and personal information form were used to collect the data in the research.

General self-efficacy scale: General self-efficacy scale which was developed by Jerussalem and Schwarzer (1992) and adapted into Turkish by Yeşilay (1996) was used to determine students' perceived self-efficacy. It is one dimensional scale with 10 items and Five-point Likert-point scaling. In the context with the research, the validity and reliability of the scale were re-tested. Confirmatory factor analysis (CFA) was conducted to test the validity of the scale. As a result of CFA, it was found that the scale has fit index values (χ^2/df = 44.17/34 = 1.3; RMSEA = .03; CFI = .99; TLI = .99; GFI = .97; AGFI = .96). The reliability of the scale was calculated with Cronbach Alpha coefficient. Cronbach Alpha coefficient for the scale is .95.

Positive-negative perfectionism scale: Positive-negative scale which was developed by Kırdök (2004), consists of 17 items with 2 sub-dimensions and Four-point Likert-point scaling. While the positive perfectionism sub-dimension comprises of 10 items, whereas the negative perfectionism sub-dimension comprises of 7 items. The factor loadings for positive perfectionism sub-dimension vary between .47 and .64 and account for 18.22 % of the total variance. On the other hand, the factor loadings for negative perfectionism sub-dimension vary between .52 and .64 and account for 14.22 % of the total variance. Alpha coefficient for positive perfectionism sub-dimension is .95, while alpha coefficient for negative perfectionism sub-dimension is .78. In the context with the research, the validity and reliability of the scale were re-tested. CFA was implemented to test the validity of the scale. CFA indicated that the scale has fit index values (χ^2/df = 193.17/117 = 1.65; RMSEA = .04; CFI = .98; TLI = .97; GFI = .94; AGFI = .92). The reliability of the scale was tested with Cronbach Alpha coefficient. Cronbach Alpha coefficient was calculated for positive perfectionism as .92 and for negative perfectionism as .94.

Self-handicapping scale: Self-handicapping scale which was developed by Jones and Rhodewalt (1982) and adapted into Turkish by Akın (2012), was employed to measure students' level for self-handicapping. It is one dimensional scale with 25 items and Six-point Likert-point scaling. Higher scores derived from the scale indicate that an individual's verbal and behavioral tendencies for self-handicapping are high. According to CFA conducted by Akın (2012), it is seen that the scale has fit index values (χ^2 = 50.23, p = .058, RMSEA = .037, NFI = .98, CFI = .99; GFI = .97, AGFI = .94). The factor loadings for the scale differ between .34 and .69. Cronbach Alpha internal consistency reliability coefficient for the general scale is .90. In the context with this research, the validity and reliability of the scale were re-tested. CFA was conducted to test the validity of the scale. It was revealed that it has fit index values (χ^2/df = 630.36/273 = 2.31; RMSEA = .06; CFI = .95; TLI = .94; GFI = .87; AGFI = .85). The reliability of the scale was tested through Cronbach Alpha coefficient and it is .97 for the general scale.

2.3. Data Analysis

Some treatments were employed prior to the analysis of the data obtained from the participants. Descriptive analysis was conducted to examine the data accuracy and it was tested whether the missing values took place. Besides, Mahanalobis values were calculated to determine the outlier and univariate and multivariate normality (skewness and kurtosis, Mardia's multivariate normality coefficient and critical ratio value) and multicollinearity were tested. As a result of the conducted analyses, it was seen that the data for each variable were normally distributed among themselves [the values for skewness and kurtosis varied between +1 and -1] (Çokluk et al., 2012), the calculated values for all the data did not meet multivariate normality

assumption [Mardia's multivariate normality coefficient is 61.27 and critical ratio value 7.50>5] (Bentler, 2006). When dataset does not meet multivariate normal distribution assumption, Bootstrap analysis method, which does not require a pre-requisite for multivariate normal distribution assumption, is suggested to be used (Bayram, 2013). Following these treatments; descriptive statistics were employed to reveal the current state. Pearson correlation analysis was conducted to determine the relationships between the variables. Besides, path analysis was conducted to test the validity of the suggested model. Lastly, bootstrap analysis method was conducted to identify the significance level of the mediation effect in the model. SPSS and AMOS statistic package programs were used to analyze the data. The significance level for the research was .05.

3. Findings

Arithmetic mean and standard deviations with regard to students' positive and negative perfectionisms, self-handicapping, self-efficacy and academic achievement and Pearson correlation coefficient values indicating the directions and levels of the relations between the variables are displayed in Table 1.

Table 1. Arithmetic mean and standard deviations for positive and negative perfectionisms, self-handicapping, self-efficacy and academic achievement and Pearson correlation coefficient values

Variables	Range	$\bar{x}$	Sd	1	2	3	4	5
1. Academic achievement	1-4	2.83	.45	1				
2. Self-efficacy	1-5	3.82	.69	.64**	1			
3. Self-handicapping	1-5	2.80	.83	-.66**	-.76**	1		
4. Positive perfectionism	1-4	3.27	.61	.60**	.63**	-.69**	1	
5. Negative perfectionism	1-4	2.28	.74	-.58**	-.59**	.67**	-.52**	1

**p< .01

According to Table 1, there are moderately positive relationships between perceived self-efficacy (r= .64; p< .01) and positive perfectionism levels (r = .60; p<.01) with regard to students' academic achievement (r= .64; p< .01), whereas there are moderately negative relationships between self-handicapping levels (r = -.66; p< .01) and negative perfectionism levels (r = -.58; p< .01) with regard to their academic achievement. It was found that there are largely negative relationships between students' perceived self-efficacy and self-handicapping levels (r = -.76; p< .01) and moderately negative relationships between their perceived self-efficacy and negative perfectionism levels (r = -.59; p< .01), while there are moderately positive relationships between their perceived self-efficacy and positive perfectionism levels (r = .63; p< .01). It was revealed that there are moderately negative relationships between students' self-handicapping levels and positive perfectionism levels (r = -.69; p< .01) and moderately positive relationships between their self-handicapping levels and negative perfectionism levels (r = .67; p< .01). When the arithmetic means for the variables are taken into account, it is seen that they are for students' academic achievement levels ($\bar{x}$ = 2.83), perceived self-efficacy ($\bar{x}$ = 2.83), self-handicapping levels ($\bar{x}$ = 2.80), positive perfectionism levels ($\bar{x}$ = 3.27) and negative perfectionism levels ($\bar{x}$ = 2.28).

The path diagram with the standardized estimated values for the research model including positive and negative perfectionisms, self-handicapping, self-efficacy and academic achievement created based on the literature review are displayed in Fig. 2.
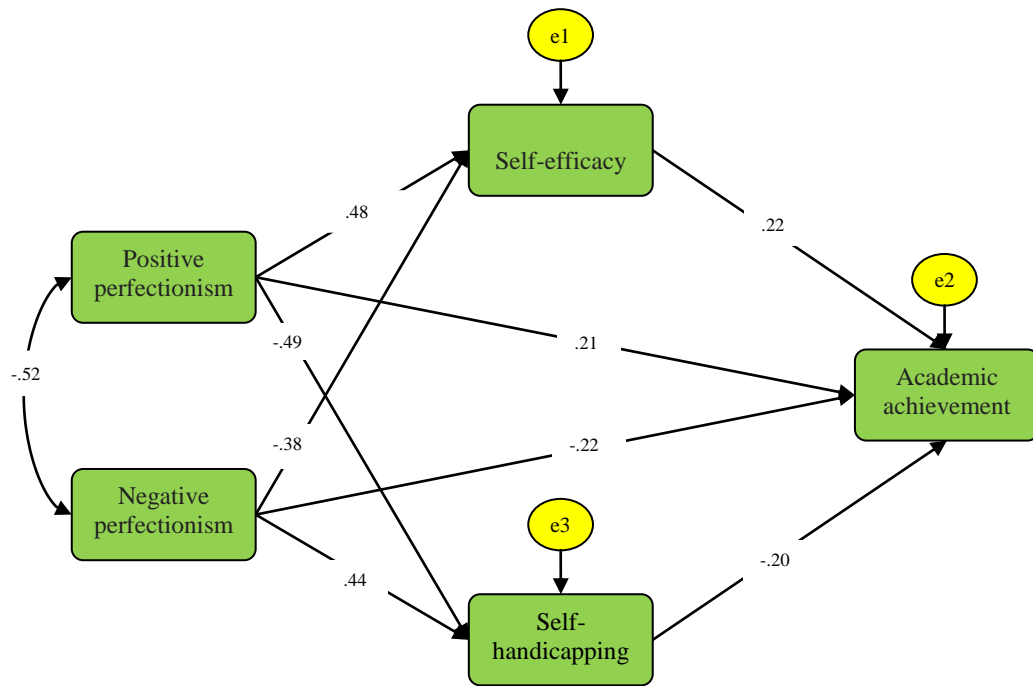
Fig. 2. The analysis results and standardized estimated values for the suggested research model
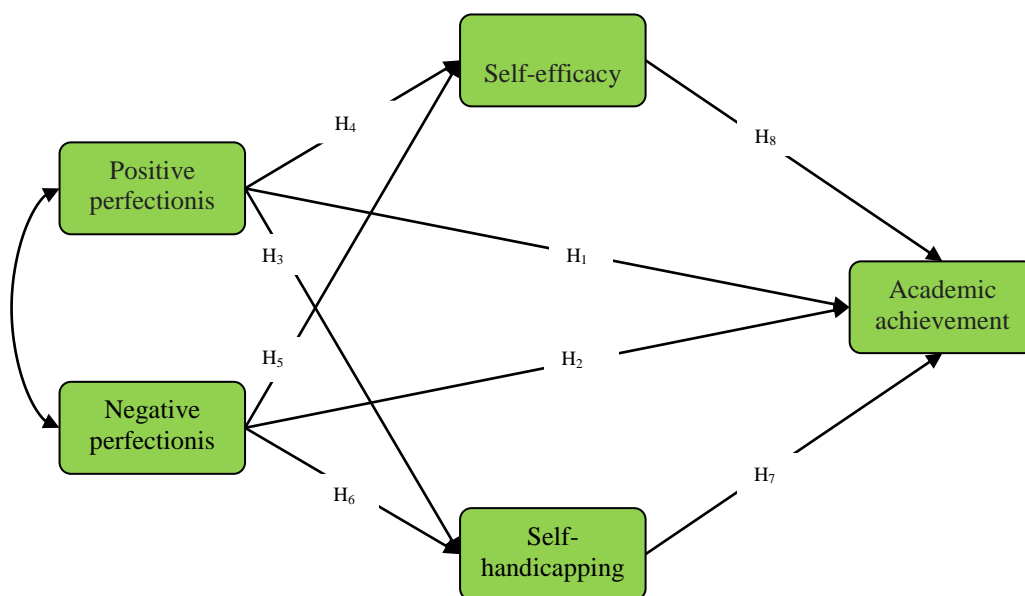
The fit index values derived from the analysis of the suggested model based on positive and negative perfectionisms, self-handicapping, self-efficacy and academic achievement indicate that they are acceptable values (χ^2/df = 2166.18/1313 = 1.65; RMSEA = .043; CFI = .94; TLI = .93; GFI = .87; AGFI = .85). The standardized values obtained from the analysis of the model are displayed in Table 2.

Table 2. The standardized values obtained from the analysis of the model

Paths between variables			B	β	S.E.	C.R.(t)	P
Self-efficacy	<---	Positive perfectionism	.32	.48	.075	8.22	***
Self-handicapping	<---	Positive perfectionism	.56	.44	.062	8.98	***
Self-handicapping	<---	Positive perfectionism	-.89	-.49	.099	-8.92	***
Self-efficacy	<---	Negative perfectionism	-.34	-.38	.047	-7.21	***
Academic achievement	<---	Self-efficacy	.31	.22	.093	3.27	.001
Academic achievement	<---	Self-handicapping	-.19	-.20	.075	-2.55	.011
Academic achievement	<---	Negative perfectionism	-.28	-.22	.073	-3.75	***
Academic achievement	<---	Positive perfectionism	.36	.21	.112	.324	.001

According to the data in Table 2, the characteristics for students' positive perfectionism directly, positively and significantly affect their perceived self-efficacy (β = .48; p< .05) and academic achievements (β = .21; p< .05), whereas they directly, negatively and significantly affect self-handicapping behaviors (β = -.49; p< .05). The characteristics for students' negative perfectionism directly, negatively and significantly affect their perceived self-efficacy (β = -.38; p< .05) and academic achievements (β = -.22; p< .05), while they directly, positively and significantly affect their self-handicapping behaviors (β = .44; p< .05). Students' perceived self-efficacy directly, positively and significantly influences their academic achievements (β = .22; p< .05), whereas self-handicapping behaviors directly, negatively and significantly affect their academic achievements (β = -.20; p< .05). Based on these findings, it is understood that the

hypothesizes of the research including H1, H$_2$, H$_3$, H$_4$, H$_5$, H$_6$, H$_7$, H$_8$ were accepted. Besides, the characteristics of students' positive and negative perfectionisms account for 58 % of perceived self-efficacy variance and 68% of self-handicapping variance. It was found that their positive and negative perfectionisms account for 54 % of self-efficacy, self-handicapping and academic achievement variance.

Bootstrap analysis was conducted to examine the significance of the mediation effects in the suggested model. In this context, the model was re-analyzed in 95 % confidence interval through protected error and corrected bootstrap method by determining the sampling size as 1000, which is indeed 350. They were analyzed through AMOS statistic package program. The characteristics of students' negative perfectionism (Indirect effect = -.17 [-.26; -.09) indirectly, negatively and significantly influence their academic achievements through self-efficacy and self-handicapping, whereas the characteristics of their positive perfectionism (Indirect effect = .20 [.11; .30]) indirectly, positively and significantly influence their academic achievements through self-efficacy and self-handicapping. Based on these findings, it is understood that the hypothesizes for H$_8$ and H$_9$ were accepted.

4. Discussion and Conclusion

This research aimed at investigating the relationships between positive and negative perfectionisms, self-handicapping, self-efficacy and academic achievement. In this context with this purpose, an extensive literature review was conducted and a model was suggested. Structural equation model was used to test the model based on the data derived from the research. It was understood that the model in its current form was accepted.

As a result of the research data, it was seen that positive perfectionism has a significant positive effect on perceived self-efficacy and academic achievement in contrast to the significant negative effect on self-handicapping. This result means that those students who are inclined to have positive perfectionism, experience more perceived self-efficacy and academic achievement and less self-handicapping behaviors. It is known that positive perfectionist students have higher motivation and intrinsic control focus to reach the high standards they set for themselves (Frost et al., 1990). The fact that students are highly motivated, can enable them to be successful. When the recent researches conducted in this scope are examined, it is seen that those positive perfectionist students prefer solving more complex questions compared with those negative perfectionist students when they are given questions classified from simple questions to complex ones (Stoeber et al., 2008). This result revealed that positive perfectionist students have higher motivation levels and more beliefs in their self-efficacy to achieve an extremely difficult goal. It was stated in the study conducted by Stoeber et al. (2008) that positive perfectionist people are more optimistic about their competences. Besides, the reason for recurred successful performance depends on the increase in one's belief in perceived self-efficacy. A variety of different researches indicate that those positive perfectionist people employ better strategies to overcome stressful cases and get higher academic achievement (Cheng, 2001; Rice, Slaney, 2002; Nounopoulos et al., 2006). According to Kottman (2000), these people do not experience excessive anxiety to attain high standards and are not discouraged when they do not reach the aims they set. On the contrary, they are more motivated to work hard and rationally. Haase et al. (2002) argued that these people can change their aims when they do not attain the aims they have set. This indicates that these people are flexible and have high self-regulation skills. In this regard, it is an expected result for them not to need to use strategies for self-handicapping.

It was found in the current research that negative perfectionism has a significant negative effect on perceived self-efficacy and academic achievement and a significant positive effect on self-handicapping. It can be inferred from this result that those students with a sense of high negative perfectionism, have low perceived self-efficacy and academic achievement and are high self-handicappers. It is known that these students are inclined to set unrealistic aims beyond their capacities and constantly experience fear and anxiety to make mistakes. The fact that they have standards beyond their capacities and do not have knowledge, ability and skills to reach those standards, can negatively affect their beliefs in their capacities and academic achievements. Besides, they can exhibit more self-handicapping behaviors to protect their self-esteem and not to be perceived as untalented and unskillful. The previous researches support this result (Ram, 2005; Shaheen, 2013; Lotar, 2005). As the negative perfectionist people focus on fear of failure, their

motivations lessens and their anxiety increases, therefore, they delay or avoid their works they are required to fulfill (Bieling et al., 2004; Slaney, Ashby, 1996; Stoeber, Otto, 2006; Bieling et al., 2003). It is seen in the research conducted by Öner-Sünkür et al. (2013) that the negative perfectionist students' undertaking academic risk is low. All these results help us understand why these students' perceived self-efficacy and academic achievements are at low level. It was found in the study conducted by Ellis and Knaus (1977) that the most important predictors for self-handicapping in academic field are lack of self-confidence and anxiety level for the works to be fulfilled. It is inevitable for these students to face negative results when they are considered to act in apprehensive manner including fear and anxiety, and be constantly doubtful about themselves. It can be argued that they exhibit self-handicapping behaviors to conceal the negative results stemming from themselves, which can cause to jeopardize their self-esteem.

Another important result derived from the current research is that perceived self-efficacy positively and significantly affects academic achievement, while self-handicapping negatively and significantly affects academic achievement. Abedini et al. (2010) state that the people with a high sense of perceived self-efficacy use more cognitive and meta-cognitive strategies, and have a lower exam anxiety, thereby attaining higher levels in academic achievement. Self-efficacy is an important motivational construct to influence individual preferences, purposes, emotional reactions, efforts and determinations (Stajkovic, Luthans, 1998). In this regard, it is an expected result for the students with a high sense of perceived self-efficacy to be successful in academic sense. It was found in the research implemented by Sahranç (2011) that the people who heavily use self-handicapping strategies, experience more depression, anxiety and stress. It was indicated in the research conducted by Zuckerman et al. (1998) that self-handicapping behaviors negatively affect one's well-being. Urdan and Midgley (2001) revealed that the students who exhibit self-handicapping behaviors at schools do not make enough effort, do not seek help when it is needed, avoid taking risks and give up when they encounter a difficult situation. It was found in the research conducted by Zuckerman et. al. (1998) and Garcia (1995) that those who use self-handicapping strategies have lower performance, poor working habits and repetition strategies, a sense of low self-efficacy and low skills to manage time compared with those who do not use self-handicapping strategies. All these results give us hints about the reasons why those who heavily use self-handicapping strategies display poor academic achievement.

It was seen in the present research that self-efficacy and self-handicapping have a mediation role in the relationship between positive perfectionism and academic achievement. The results of the analysis indicate that this role is partial. Positive perfectionism has a direct effect and indirect effect on academic achievement through perceived self-efficacy and self-handicapping. That is, it can be argued that students' positive beliefs in their self-efficacy are affected by their setting realistic aims, being highly motivated and happy with their achievements and changing their aims according to their positions when it is required. Besides, these students do not need to employ self-handicapping behaviors. All these factors can enable them to be successful in academic sense.

Another striking result obtained from the research is that self-efficacy and self-handicapping have a partial mediation role in the relationship between negative perfectionism and academic achievement. Negative perfectionism has a direct effect and an indirect effect on academic achievement. Based on this result, it can be claimed that those students who have unrealistic and unattainable aims and standards, constant fear of being unsuccessful and criticized by others, are not satisfied with the achievements they attain, can be suspicious about their potentials and employ self-handicapping strategy to protect their psychological health against these negative outcomes and as a result, can be unsuccessful in academic sense.

Lastly, positive and negative perfectionism account for 58 % of perceived self-efficacy variance, 68 % of self-handicapping variance. It was revealed that positive and negative perfectionism, self-efficacy and self-handicapping account for 54 % of academic achievement variance.

All these results indicate that positive and negative perfectionism have direct and indirect significant effects on academic achievement. In this respect, it can be suggested that parents and teachers should struggle to develop the characteristics for students' positive perfectionism and decrease their characteristics for negative perfectionism.

This research has several limitations. First of all, this study is limited with the perceptions of the students studying at the faculty of education. This case is thought to restrict the generalization

of the results derived from this research. Secondly, it is impossible to make causal inferences as this study is a cross-sectional study. Thirdly, as the data were obtained from self-rating scales, this study is limited how the participants understood the items in the scales and whether they were honest while responding the items.

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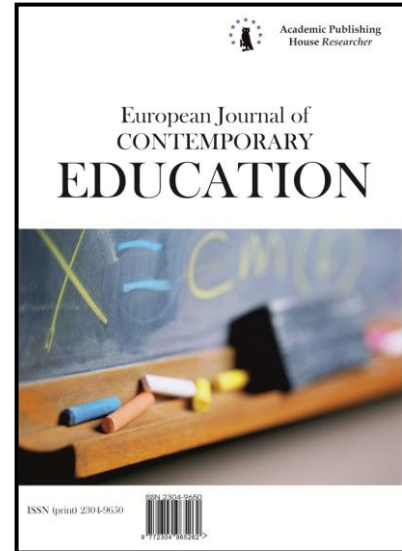
Social Emotional Skills and Prosocial Behaviour among 15–16-year-old Adolescents

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Abstract

The purpose of this study was to determine and compare social emotional skills and prosocial behaviour among 15 – 16 – year-old adolescent athletes and non-athletes. The measures of social emotional skills and prosocial behaviour were evaluated using Schutte Self-Report Inventory, Self-control scale, Social Skills Rating System (Student form), Bulotaite and Gudzinskiene communication skills questionnaire, revised prosocial tendencies measure. The study results revealed that adolescent sport participation has influence on social skills and strongly links to athletes' prosocial behaviour. Emotional, social and prosocial behaviours have an effect on gender differences.

Keywords: social emotional skills, prosocial behaviour, adolescent athletes and non-athletes.

1. Introduction

Social emotional skills are particularly important during adolescence because youth at this stage are going through rapid biological, cognitive, and physiological changes associated with puberty (Yurgelun-Todd, 2007). These developmental and contextual shifts challenge positive youth development and increase normative risk for problem behaviours such as violence, substance use, and school dropout (Guerra, Bradshaw, 2008; Steinberg et al., 2011). According to CASEL (2015), adolescents also engage in more risky behaviour than younger students and face a variety of challenging situations, including increased independence, peer pressure, and exposure to social media.

Students with poor social emotional skills are more at risk of experiencing learning difficulties and engaging in such behaviours as anti-social behaviour, violence and criminality, and to leave school without any certification or vocational skills, with consequently poor employability opportunities (Adi et al., 2007; Bradley et al., 2008; Colman et al., 2009). In contrast, students with higher social emotional skills tend to perform better in school (Rivers et al., 2012;

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Malinauskas, Dumciene, 2017), have better quality relationships (Lopes et al., 2004), resolve conflict in more constructive ways (Brackett et al., 2006), solve social reasoning problems more effectively (Reis et al., 2007), and engage less frequently in unhealthy behaviours (Brackett et al., 2004).

Since prosocial behaviour is defined as voluntary behaviour intended to help or benefit another (Carlo et al., 2013; Eisenberg et al., 2006), researchers emphasize that knowledge about prosocial behaviour as an important phenomenon can be useful for a better understanding of overall psychosocial development during adolescence (Carlo et al., 2010). Substantial evidence supports the idea that prosocial behaviour is learned through observation and verbal behaviour. Therefore the study is based on the Social Cognitive Theory (Bandura, 1977), which is one of the widely used models to address the importance of observational learning, imitation and modelling. Social cognitive theory emphasizes learning from the social environment and postulates reciprocal interactions among personal, behavioural, and social, environmental factors. Sport as a social environment plays an important role in the lives of many adolescents (Malinauskas, Juodsnukis, 2017; Trottier, Robitaille, 2014) life. Many researchers have emphasized that the pro-social development of youth is promoted in sporting environment (Fraser-Thomas, Côté, 2009; Kavussanu et al., 2013; Wells et al., 2008) where new friends are found, new contacts are established, and adolescents become part of the growing social network. Sporting activities encourage children to help others and to develop altruism and empathy (Lee et al., 2008). Adolescents who play sports are friendlier to peers, especially to those involved in similar activities, and have less contact with peers who are inclined to engage in antisocial behaviour (Smoll et al., 2011; Trottier, Robitaille, 2014).

Study hypothesis – we hypothesize that adolescent athletes have more developed social emotional skills and display more prosocial behaviour than adolescent non-athletes.

The aim of the study – to determine and compare social emotional skills and prosocial behaviour among 15–16-year-old adolescent athletes and non-athletes.

2. Research methods

Instruments. For the quantitative phase, a cross-sectional survey design was used. To study the prosocial behaviour of adolescent athletes and non–athletes, we used the Revised prosocial tendencies measure (PTM-R, Carlo, Hausmann, Christiansen, Randall, 2003). This scale was adapted to the Lithuanian population using back-translation procedures and was validated (Sukys, 2004). These previous studies showed acceptable reliability of the subscales ranging from 0.63 to 0.86. The PTN-R assesses six types of prosocial behaviours: public, anonymous, dire, emotional, compliant, and altruistic. The subjects had to rate each statement using a 5-point Likert-type scale (1 = *does not describe me at all*, 5 = *describes me greatly*, except for altruism, which used reverse scoring). Higher scores on each of the subscales reflected a stronger tendency to engage in prosocial behaviour.

To determine adolescents' social emotional skills following questionnaires were used:

Schutte Self-Report Inventory (SSRI), developed by Schutte and colleagues (1998). This instrument is extremely beneficial in the way that it divides emotional skills into four separate components (Palmer, 2003), namely: ability to use personal positive emotional experience, ability to assess emotions, ability to understand and analyze emotions and ability to manage emotions. The SSRI comprises 33 items (in our case 15 items), which students need to evaluate by using a 5-point scale, where 1 means „*strongly disagree*" and 5 – „*strongly agree*". In this study, we used only the ability to assess emotions (6 items) and the ability to understand and analyse emotions (9 items) assigned parts of the questionnaire. In the current study a Cronbach alpha of .78 was found for the SSRI total score (ability to assess emotions subscale – .76, ability to understand and analyse emotions subscale – .81). The Lithuanian version of the SSRI shows internal consistency value .79 and a test-retest reliability coefficient of .84 for the overall questionnaire (Malinauskas, Vazne, 2014).

Self-control scale (Grasmick et al., 1993) consists of 24 items, divided evenly into impulsivity, simple tasks, risk seeking, physical activities, self-centered, and temper subscales. The subjects had to rate each item using a 4-point scale (1 = *strongly agree* to 4 = *strongly disagree*). The previous studies (Grasmick et al., 1993; Delisi et al., 2003) showed acceptable reliability of the subscales ranging from .81 to .91.

Communication skills questionnaire, developed by Bulotaite and Gudzinskiene (2003), consists of 30 items (in our case 20 items, because the scale of situational skills was not analysed) which students need to assess using a 4-point scale (1 = *I fail to do that*, 2 = *I do not really lucky*, 3 = *I do pretty well*, 4 = *I do great success*). The Lithuanian version of the communication skills survey questionnaire has a reported internal consistence of .71 (Akelaitis, Malinauskas, 2016).

Social Skills Rating System, Student form (SSRS-S), developed by Gresham and Elliott (1990). The SSRS-S is self-report questionnaire for the 7th to 12th grade students, consisting of 39 items (in our case 19 items) to which each student responded based on two parameters: the frequency of the behaviour and their perceived importance of the behaviour. In this study, we used only the cooperation (10 items) and assertiveness (9 items) skills assigned parts of the questionnaire. Each item is rated on a 3-point frequency scale (0 = *never*, 1 = *sometimes*, 2 = *many times*), based on respondents' perception of the frequency with which they exhibit each behaviour. In addition, the questionnaire includes a rating of importance on a 3-point scale (0 = *not at all important*, 1 = *important*, 2 = *very important*). In the current study a Cronbach alpha of .71 was found for the SSRS-S total score (cooperation subscale – .68, assertiveness subscale – .67). The Lithuanian version of the SSRS-S ranges from .66 to .76 (Akelaitis, Malinauskas, 2016).

Statistical Analysis. Research data analysis was performed using SPSS version 22.0 and included calculating Cronbach's alpha coefficients, descriptive statistics, independent samples *t* tests, Cohen's *d* effect sizes. Statistical significance was set at $p < .05$.

Sample and procedure. A total of 468 adolescents (258 girls and 210 boys) aged between 15 and 16 years (M = 15.76; SD = 0.43) participated in the quantitative study. They were recruited from 12 general education schools in Kaunas, Klaipeda, Siauliai, Alytus cities, including Kaunas district secondary schools, using multi-stage sampling. In phase one, we selected schools from all lists of schools. In the second phase, we selected participants using a simple random sampling of classes from the selected schools. In the third phase, we invited all students to participate in the survey from the selected classes. For the data analysis, the participants were divided into two groups: athletes (n = 140) and non-athletes (n = 328). Students' sport participation was assessed using the question "Do you participate in competitive sports?" with three alternative answers. This question has been validated with adolescents in earlier studies (Sukys, 2004).

The research was carried out during the period from January, 2016 to March, 2016. The principles of benevolence, research ethics and legal requirements were observed. Prior to the research, each school principal's permission to interview the students was obtained. In some cases, permission from the regional Education Department was sought prior to receiving the school principal's permission. The researchers visited the schools at an arranged time. Permission was obtained from school administrators to conduct the study and then we contacted the senior management at the target schools. Prior to collecting data from the students, parental informed consent forms were completed and informed consent was obtained from the students themselves with the understanding that participation in the study was voluntary. The students completed the survey with the researchers present in the classroom. The social worker and the psychologist of the school were present in the class. The research goal was explained to the children and they were instructed on how to fill in the questionnaire. The anonymity of the survey and the possibility to refuse participation were also explained. The filled-in questionnaires were sealed in envelopes.

3. Results

The analysis of social emotional skills among adolescent athletes and non-athletes showed that athletes have more developed assertiveness skills than non-athletes: (t (466) = 2.77; $p < .01$; d = .26). Meanwhile, Student's *t* test for independent samples showed that there no significant differences between adolescent athletes and non-athletes in terms of their abilities to assess, understand and analyse emotions, self-control, communication, and cooperation skills ($p > .05$) (Table 1).

Table 1. The statistical indicators of social emotional skills and prosocial behaviour among athlete and non-athlete adolescents (*M ± SD*)

Variables	Athletes (n = 140)	Non-athletes (n = 328)	Scores of Student's *t* - test	*p - value*	*Cohen's d*
Emotional skills:					
Ability to assess emotions	22.25 ± 2.90	22.33 ± 3.63	-.22	.826	.02
Ability to understand and analyse emotions	32.10 ± 4.02	32.60 ± 4.31	-1.18	.238	.11
Self-control	59.82 ± 4.52	59.68 ± 4.59	.33	.742	.03
Social skills:					
Communication	56.74 ± 9.23	57.03 ± 9.05	-.31	.755	.03
Cooperation	12.03 ± 3.43	12.28 ± 3.31	-.76	.451	.07
Assertiveness	11.14 ± 3.07	10.28 ± 3.07	2.77**	.006	.26
Prosocial behaviour:					
Public	8.99 ± 2.83	8.25 ± 2.51	2.81**	.005	.26
Emotional	18.14 ± 3.85	17.29 ± 4.43	1.97*	.049	.18
Altruism	13.72 ± 3.88	12.92 ± 3.40	2.23*	.027	.21
Dire	11.06 ± 2.44	10.44 ± 2.49	2.48*	.014	.23
Compliant	7.44 ± 1.78	7.40 ± 1.75	.25	.806	.02
Anonymous	10.57 ± 3.78	10.27 ± 3.72	.79	.432	.07
Total of prosocial behaviour	69.91 ± 9.80	66.57 ± 10.57	3.20**	.001	.30

Notes. (M ± SD) – mean and standard deviation; *Cohen's d* – effect size; * - $p < .05$; ** - $p < .01$.

Data analysis also showed the significant differences in terms of prosocial behaviours among adolescent athletes and non-athletes: Student's *t* test for independent samples indicates that athletes reported greater mean public ($t (466) = 2.81$; $p < .01$; $d = .26$), emotional ($t (466) = 1.97$; $p < .05$; $d = .18$), altruistic ($t (466) = 2.23$; $p < .05$; $d = .21$), and dire ($t (466) = 2.48$; $p < .05$; $d = .23$) prosocial behaviours than non-athletes. The adolescent athletes also demonstrated higher overall score of prosocial behaviour ($t (466) = 3.20$; $p < .01$; $d = .30$) than non-athletes.

The comparison of social emotional skills among adolescent girls and boys revealed that girls were more able to understand and analyse emotions ($t (466) = 5.37$; $p < .001$; $d = .50$), and to collaborate ($t (466) = 2.39$; $p < .05$; $d = .22$) with others than boys (Table 2).

Table 2. The statistical indicators of social emotional skills and prosocial behaviour among adolescent girls and boys (*M ± SD*)

Variables	Girls (n = 258)	Boys (n = 210)	Scores of Student's *t* - test	*p - value*	*Cohen's d*
Emotional skills:					
Ability to assess emotions	22.47 ± 3.15	22.10 ± 3.73	1.19	.236	.11
Ability to understand and analyse emotions	33.37 ± 4.10	31.32 ± 4.11	5.37***	.000	.50
Self-control	59.66 ± 4.56	59.80 ± 4.57	-.31	.755	.03
Social skills:					
Communication	57.56 ± 8.46	56.19 ± 9.79	1.63	.104	.15
Cooperation	12.54 ± 3.11	11.80 ± 3.58	2.39*	.017	.22
Assertiveness	10.16 ± 3.05	10.11 ± 3.13	.16	.874	.02
Prosocial behaviour:					
Public	8.19 ± 2.57	8.81 ± 2.66	-2.59*	.010	.24
Emotional	18.22 ± 4.22	16.71 ± 4.21	3.84***	.000	.36
Altruism	13.33 ± 3.33	11.92 ± 3.52	4.43***	.000	.41

Dire	10.62 ± 2.46	10.44 ± 2.59	.76	.449	.07
Compliant	7.63 ± 1.67	7.14 ± 1.82	3.03**	.003	.28
Anonymous	9.85 ± 3.77	11.00 ± 3.61	-3.33**	.001	.31
Total of prosocial behaviour	67.83 ± 10.35	66.03 ± 10.52	1.86	.064	.17

Notes. (M ± SD) – mean and standard deviation; *Cohen's d* – effect size; * - $p < .05$; ** - $p < .01$; *** - $p < .001$.

The results from the current study showed that there no significant differences between adolescent girls and boys in terms of their abilities to assess emotions, self-control, communication, and assertiveness skills ($p > .05$).

There were also the significant differences between adolescent girls and boys in terms of their prosocial behaviours: girls reported greater involvement in emotional (t (466) = 3.84; $p < .001$; d = .36), altruism (t (466) = 4.43; $p < .001$; d = .41), and compliant (t (466) = 3.03; $p < .01$; d = .28) prosocial behaviours than boys. In contrast, adolescent boys reported greater mean public (t (466) = -2.59; $p < .05$; d = .24), and anonymous (t (466) = -3.33; $p < .01$; d = .31) prosocial behaviours than adolescent girls.

4. Discussion

The purpose of this study was to determine and compare social emotional skills and prosocial behaviour among 15–16-year-old adolescent athletes and non-athletes. First, we identified the prosocial behaviour and social emotional skills and compared results between athletes and non-athletes. The study results showed that sport have no influence on emotional adolescent skills, namely: ability to assess emotions, ability to understand and analyse emotions, self-control, however on social skills we found that adolescent athletes scored higher on assertiveness skills compared to non-athletes. Therefore social skills such as communication and cooperation had no significant impact. It is important to note that adolescent athletes scored higher on prosocial behaviour skills on four subscales: public, emotional, altruism, dire. The total prosocial behaviour score showed statistically significance on adolescent athletes overall prosocial behaviour. Tuncel (2010) compared prosocial tendencies of athletes and non-athletes and found that that participants displayed anonymous prosocial behaviour most followed by emotional, altruistic, dire, public and compliant. In addition, our study revealed that a social skill such as assertiveness is important predictor finding links between prosocial behaviours. Sage and Kavussanu (2007) support our findings and found that both social affiliation and social recognition were positively associated with prosocial behaviour, whereas social status was positively linked to antisocial behaviour. Moreover, the study of Kavussanu, Stanger, Boardley, (2013) found that prosocial behaviour toward opponents was positively associated with moral identity and empathy. The current study findings suggest that sport as a social phenomenon strongly influences young athletes' personality development. Young athletes act more prosocially compared to non-athletes by helping others in a various of situations and demonstrate empathy, altruism towards others. Authors Bredemeier & Shields (2006); Camire & Trudel (2010) emphasized that participation in sports can lead to positive experiences and beneficial outcomes such as increased self-esteem, confidence, citizenship, character building, identity development, meaningful adult and peer relationships, academic achievement, and decreased delinquency.

Continuing the discussion we identified whether adolescent gender has a difference on adolescent prosocial behaviour and social, emotional skills. The study revealed that girls scored higher on emotional skills, such as ability to understand and analyse emotions and social skills such as cooperation. Moreover, boys scored higher on prosocial behaviour such as public and anonymous. However, girls expressed higher on other prosocial behaviour such as emotional, altruism, compliant compared to boys. Study by Tunel, (2010) supports our findings that at late adolescence age females were more likely to report emotional prosocial behaviour than males.

Although the present study examined the links between prosocial behaviour and social emotional skills in the Lithuanian context and is one of the few studies which examined such predictors in the sport context there are a few limitations of our study which should be mentioned. Firstly, data were collected evaluating middle adolescence age and enabled to get a deeper

understanding of this particular age of group. It would be appropriate to conduct similar study by examining early and late adolescence age. Secondly, longitudinal designs might be used in future to examine athletes' prosocial behaviour in relation to social and emotional skills, and how these skills occur over time. Finally, we did not identified participants of the study whether they are individual or team sport athletes. Evaluating specifically individual or team sport athletes could inform useful information for theorists and practitioners the importance of young athletes' prosocial behaviour and social emotional skills in youth sport environment.

5. Conclusion

Adolescent sport participation and the development of adolescent social, emotional skills in sport environment have a positive impact on youth prosocial behaviour. Adolescent sport participation has influence on social skills and strongly links to athletes' prosocial behaviour. Emotional, social and prosocial behaviours have an effect on gender differences. Boys are more prosocial on public and anonymous behaviours compared to girls. Girls expressed emotional intelligence such as emotional prosocial behaviour, as well as altruism and compliant. Overall the study results revealed that youth sport participation have a positive effect on adolescent personality development.

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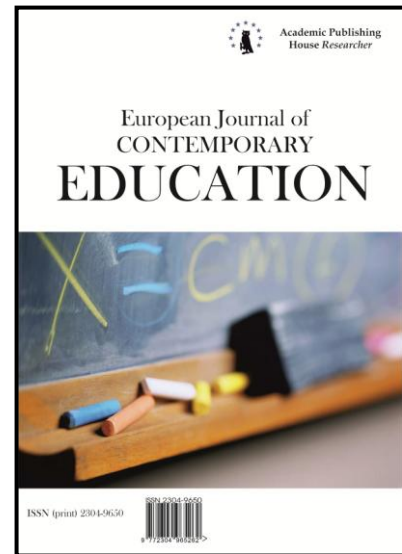
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**Faculty Support for Internationalization:
The Case Study of a United States Based Private University**

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Abstract

Universities around the world are internationalizing themselves at a higher pace than even seen before. Faculty support is recognized as critical for the success of the internationalization mission. However, faculty motivation and commitment are often taken for granted; administrators direct most of their attention to tackling partnership issues and managing the external environment. This paper unravels certain critical issues associated with faculty support for internationalization in a small private university located in a US jurisdiction area. Data show that absence of an institutional structure for effective organizational communication would result in imperfect information about internationalization being circulated. Also, incentives like sabbaticals and paid leaves will help improve faculty motivation and thereby garner their support.

Keywords: internationalization, higher education, challenges, faculty support, shared governance, culture.

1. Introduction

Since the early 2000's, we have been observing radical shifts in the global higher education landscape, primarily as a result of pressures from the knowledge-based economy and innovations in the information technology (Green, 2002; Marginson, Van der Wende, 2007; Nair, George, 2016). For survival, relevance, and success, higher education institutions around the world have begun to explore creative ways of engagement with the new world order (Brewer, 2010). Education as international business was something unavoidable for cash strapped universities (Marginson, 2002).

Even locally focused small-scale colleges have made it a point to introduce in their courses and degree offerings elements of the international context (Djan, George, 2016; Heffernan, Poole, 2005). Likewise, faculty members are encouraged to attend global events, network internationally, and make their presence felt by means of publications in international journals. Most US

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universities historically have had an international student services division, too. Also included were the export and import of textbooks and other learning materials (Bourke, 2000). Over the last fifteen years and more, educational export activities have diversified beyond traditional franchising and joint ventures.

Scholarly support for internationalization came in the form of the argument that it would significantly enhance institutional agility and competitive advantage for the participating universities (Lewin, 2010; Mazzarol, Soutar, 2001). In this wave, a large number of education institutions have grown entrepreneurial and have begun to operate physically beyond their national borders by building international inter-institutional partnerships (Zheng, Oakley, 2001). Such partnerships often offered students dual or joint degrees. In addition to creating opportunities for access, new knowledge creation, and curriculum enhancement, such partnerships often resulted in significant commercial advantage for the partnering institutions (Altbach, Knight, 2007). However, with the ultra-proliferation of partnerships over the last few years, the benefits from traditional modes of partnership have spread thin. There is a heightened awareness that partnerships have to grow in scope and complexity and that mere volume in terms of student numbers or short-term revenue are not enough.

In many cases, the top management of universities unilaterally decide whether to go international, to what extent, and also the modalities. Faculty and various other significant stakeholders are not consulted (Dewey, Duff, 2009). This creates friction within the university system and has the potential to derail progress in internationalization. Often times, the senior management of the US universities assume that faculty will fall in line and that systems and procedures will develop automatically to support international expansion. However, this is not the case (Amey, 2010; Bringle, Hatcher, Jones, 2012). If partnerships are to survive after the first wave of enthusiasm, they need to become institutionalized into the fabric of the department or institution, observes Amey (2010).

Shared governance is one of the characteristics for which the US higher education institutions have historically stood stellar (George, 2007). Making governance without sufficient faculty inputs and participatory exchanges will diminish institutional effectiveness (Birnbaum, 2004). However, critics would say that it will decrease efficiency in decision making; also, faculty members do not necessarily have a privileged and superior vantage point when it comes to deciding the strategic course of a university (Gerber, 2001). They are just one of the several stakeholders, according to the counterview (Jones, 2011). This paper examines the extent of faculty support for internationalizations efforts carried out by a small private university based in a US jurisdiction area and the resultant impacts upon partnership development.

2. Relevance

The University chosen for this study (*name anonymized*) is one of the oldest private educational institutions in a US jurisdiction area. This university is categorized as a liberal arts university. It has six departments: Humanities and Social Sciences, Natural Sciences, Education, Communications, Business Administration and the Graduate School. The institution's main focus is to educate individuals holistically, through an interdisciplinary and multidisciplinary educational experience, complemented with a major field, a double major, a major and a minor, or three minors in three different disciplines. The University offers Associate, Bachelor, Professional Post-Bachelor Certificate and Master's degree programs.

The enrollment of the university has been growing in the past years due to various factors such as an aggressive marketing campaign, new and unique academic offerings, and the political instability of its government controlled main competitor. Looking at the demographic figures that point to a drastic reduction in the number of young people in the age bracket of 18–24, and the diminishing enrollment in other private institutions, the administration of the university decided to enter the international market and attract foreign students to bring their experience to home.

In the academic year 2007–2008, after elaborating a self-study report required for the accreditation process by the Accrediting Board, the administration understood that the main academic projects were on track, and that it was a perfect time to start an assertive internationalization of the university. The intention of the project is to open the university to the international market, not only in terms of the enrollment, but also inserting the university in the academic international market. Among the first steps to internationalize the university were:

agreements with the China government to bring professors to teach Mandarin and the Chinese culture, a relationship was established with the *Council for the International Exchange of Scholars,* an organization that manages the Fulbright Scholars of which various scholars have visited the Case university, and a special program was established to recruit students from Central America and from the continental USA, specifically in areas where there is a high concentration of Hispanics students (Rivera, 2012).

In November 2012, the President of the University shared his view on the internationalization project with the university community. In the document, he establishes the next steps of the project. Some of the initiatives are: to continue to establish collaboration with US mainland universities and with community colleges, continue the relationship with the Fulbright program, and the hiring of a full-time professor as International Manager, among others (Rivera, 2012). The Internationalization document was sent via e-mail to the full-time professors, and has been accessible at the University's website.

At this time, there are five core academic projects being implemented. These projects are: language across the disciplines, ethics, service learning, research competencies, and entrepreneurship development. In addition, the university has established a new academic assessment plan based on the requirements of the accrediting agency. Due to the number of academic projects, the faculty is immersed in a high number of different initiatives that takes a lot of effort and energy. At the same time, the students are being asked to participate in these projects that involve new learning experiences and changing established paradigms. Since the internationalization project was created in the academic year 2007–2008, there has been no research performed in relation to how knowledgeable is the faculty about the project, how many has participated of any of the initiatives, how willing are those who have not been involved willing to engage in the project, and what measures must the administration should take for them to participate in the project.

3. Materials and methods

With the implementation of the project detailed above, various segments were being impacted: faculty, administration, and the students. It is important for all of these segments to understand the project scope in order to implement it in the right way. From a marketing perspective, this project has to be treated as an international product launch. Since it is a service that is being offered is important to establish how knowledgeable are the persons who are offering it (faculty) and how they can be more engaged in the project.

The research objectives that guided the study were the followings:

• Determine the level of knowledge of the faculty with respect to the internationalization project.

• Establish the motivational drivers for the professors who have been involved in the project.

• Determine which motivational drivers the university management must develop in order for more professors to engage in the program.

• Determine the faculty willingness to participate in the project and establish if the willingness to participate depends on previous international learning experiences.

The research questions were:

• Does the faculty know about the internationalization project? How much they know about the project?

• What percentage of the faculty has participated in any of the different initiatives of the project? What were the main attraction factors for them to participate?

• If they have not participated, how willing are they to participate? In which initiatives they would like to participate?

• If they have been involved in any of the initiatives, how do they rate their satisfaction with the project?

Since researchers wanted to establish if there is a relationship between faculty involvement in the project and their level of knowledge, motivational drivers, and previous international learning experience, quantitative method of analysis was found suitable. Creswell (2002) establishes "in quantitative research, the investigator studies problems in which trends need to be described or explanations need to be developed for relationships among variables" (p. 50). A cross-sectional

survey design was used for gathering data. The researchers collected data only at one point in time. Creswell (2002) explains that cross-sectional designs are used to collect data that exposes current opinions, attitudes or beliefs.

The data was collected in a survey administered among the full-time professors at the university. The sample was generated utilizing proportionate stratified sampling criteria: Each stratum represented an academic department and the sample size was proportionate to the population size in each stratum. This type of sampling is preferred by the researcher because it ensures that small minority groups are represented (Trochim, Donnelly, 2008). The researcher stratified the population based on the academic departments to which they belong and then a simple random sampling was done at each stratum. This allowed for all the different academic departments to be statistically represented in the sample. The sample size consisted of 43 full-time professors out of a population size of 130 full-time professors. The size is based on a 95 % confidence level with a +- 15 % confidence interval (Trochim, Donnelly, 2008).

The questionnaire was self-administered. Different types of questions were used in the questionnaire. It included dichotomous questions, multiple choice questions and interval-level response questions, specifically the Likert scale. The types of questions were selected with the objective of designing an easy-to-answer questionnaire due to the lack of time the full-time faculty has to participate in the study.

The data recollected was analyzed using descriptive techniques and correlational analysis. Summary statistics (frequencies, means, etc.) among with measures of dispersion (e.g. standard deviation) was used to understand generalized opinions. Cross tabulations with their Chi square values were used to understand respondent distribution across two interfacing variables. Inferential analysis was considered largely not needed because of the large size of the sample in comparison with the population of professors in the university. However, significance values are provided wherever appropriate in the analysis to ensure that the findings are applicable for the population.

4. Discussion

The overall sample response rate was 65 %. The sample was composed mainly of females (61 %), 51 years old or older (86 %). Fifty percent of the sample has been teaching at the university for 25 years or more and sixty-one percent (61 %) were full professors. Fig. 1 will show the sample distribution among the different academic departments.
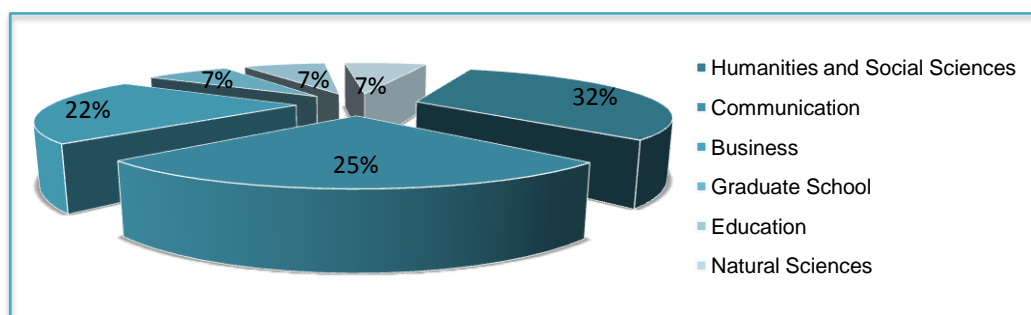
Fig. 1. Academic Departments to which sample belongs

The first question in the questionnaire measured the faculty's knowledge about the internationalization project. Sixty-one percent of the sample answered that they know about the project. The second question asked specifically about what they know about the internationalization project. An interesting finding was that only 57 % of the sample answered this issue. The remaining 43 % left the question in blank. It is interesting because based on the results of the first question, it was expected that at least the same percentage that established that they knew about the project answer this question. There were diverse answers from knowing about the initiative of attracting international students to knowledge about the different agreements with community colleges. Most of the answers were related to the initiatives where their academic department has been actively involved.

Table 1 shows the initiatives that they know about. The most known initiative was the agreement with the Chinese government. Among the different clauses in the agreement, one of them provided the university with a Chinese professor, whose main task was to teach Mandarin at the undergraduate level and give lectures about the Chinese culture. Due to the magnitude of the agreement, this initiative developed a lot of buzzwords. Following this initiative, the next one with the most knowledgeable faculty is the Faculty Resources Network. This network is very popular with the faculty because through this network they can participate in different seminars two times each year. The Summer Network is the most popular since it is based at New York University, and there are very diverse seminars topics. The least known initiative is the appointment of an International Manager. The reason behind this lack of knowledge may be the lack of an official announcement by the management to the university community.

Table 1. Initiatives that the faculty knows about

Initiative	Frequency	Percentage
Agreement with Chinese government	24	85.7 %
Faculty Resources Network	23	82.1 %
National Exchange Program	20	71.4 %
FulbrightProgram	20	71.4 %
Agreements Community Colleges	18	64.3 %
International Studies Program	15	53.6 %
Hispanic Nurse Solutions	14	50.0 %
Study Abroad Program	14	50.0 %
Appointment of International Manager	6	21.4 %

Note: Each initiative was analyzed as a separate variable. Respondents were asked to check all the initiatives they knew about.

As mentioned before, the university President wrote a document where he explains about the internationalization project. The reading of this document is necessary in order to understand the rationale of the project and all the initiatives that have been taking place at the university. The document is uploaded to the university website. One of the questions aimed at knowing how many professors have taken the time to read the document. Only 53 % of the sample has read the document. This lack of interest in reading the document has a direct effect on the knowledge about the project. For 47 % of the respondents, knowledge about the project comes from other sources, possibly grapevine (See Table 2). Crosstabs of these two variables establish that there is a significant association between these two variables.

Table 2. Cross tabulation of Knowledge about the project vs. reading the document

	Read the document	Have not read the document	
Knows about the project	9 (53 %)	8 (47 %)	17
No knowledge about the project	0 (0 %)	11 (100 %)	11
Grand Total	9	19	28

Note. The statistics were Chi square=8.58 df=1 Sig. 0.00

This lack of interest is reflected in the participation rate of faculty in activities related to the internationalization project. The majority of the sample has not attended any of the activities associated to internationalization. Table 3 shows the activities attended by the sample.

Table 3. Activities attended by the faculty

Activity	Frequency	Percentage
Have not attended any activity	19	67.9%
Conference about Arab culture	7	25.0%
Faculty Resource Network	6	21.4%
Conference about Japanese culture	3	10.7%
Other	3	10.7%
Mandarin language course	1	3.6%

It is important to find out the reasons for attending those activities because they are the motivational drivers for the faculty to get involved. The following figure (See Fig. 2) shows the main reasons for attending those activities.
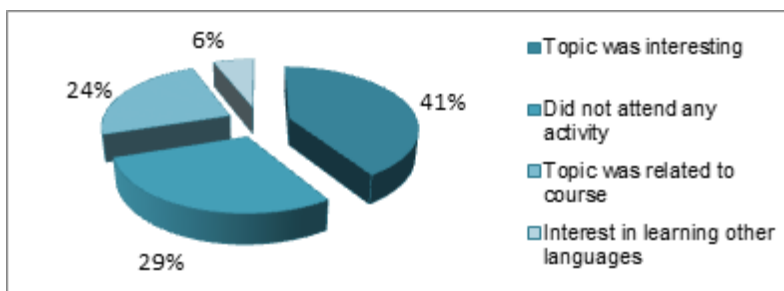
Fig. 2. Pie chart shows the reasons professors have for attending activities related to internationalization project.

For faculty to attend activities, they must perceive that the topics are interesting and related to their courses. Table 4 shows the activities in which they are interested in participating. Corroborating what was mentioned above the Faculty Resource Network is very popular among the faculty.

Table 4. Activities faculty will like to participate

Activity	Frequency	Percentage
Faculty Resource Network	16	57.1 %
Being visiting professor	12	42.8 %
Students' Recruiting Tours	7	25.0 %
Fulbright Program	6	21.4 %
Other	3	10.7 %
Not interested	3	10.7 %

Table 5 shows the incentives that faculty would like to receive to be involved more actively in activities related to the internationalization project. The most attractive incentive is the sabbatical leave followed by a reduction in academic load. At the Case university, contrary to US mainland universities, the academic load is 15 credits. It is expected that the most attractive incentives would be related to lowering this load, which is perceived by some faculty to be excessive. A sabbatical leave implies free time from academic work; therefore, they could focus on the additional internationalization activities. The reduction in academic load will give them additional time to be involved in additional activities. The respondents that mentioned other specify that they will like time to do research, free time, continued education, continued education paid by the university.

Most of the incentives mentioned are related directly or indirectly to the faculty lack of time to be involved in additional activities because of their academic load.

Table 5. Incentives faculty will like to receive

Incentive	Frequency	Percentage
Sabbatical leave	15	53.6 %
Reduction of academic load	11	35.7 %
Additional monetary compensation	10	35.7 %
Other	5	17.9 %

Table 6 shows the mean value for statements related to faculty's attitude toward the internationalization project. The statements were presented using the Likert scale. The statement that obtained the highest mean was the one regarding the timing of the project. The sample agreed that now is the perfect timing for the internationalization project. The other two statements with the highest mean were related with them believing in the project and their willingness to participate with more incentives. These findings are significant because for the project to be successful is important for the faculty to believe in it and for them to be willing to participate. It is important for the management to realize that this increase in their involvement depend on the faculty obtaining more incentives. In general, this table depicts a favorable attitude toward the project.

Table 6. Mean Values for Statements related to faculty's attitude toward the internationalization project

Variable	Mean	Standard Deviation	Minimum	Maximum	Sample
Now is the perfect timing for the internationalization project	4.0	1.7	0	5	28
I believe in the internationalization project	3.9	1.7	0	5	28
More willing to participate with more incentives	3.6	1.8	0	5	28
I have international experience teaching, studying or working.	2.9	2.2	0	5	28
Having international students in my courses makes them more interesting and challenging.	2.9	2.1	0	5	28
My experience with certain initiatives of the project has been rewarding.	2.6	2.1	0	5	28
My experience teaching international students has been enriching.	2.6	2.3	0	5	28

Note. This table shows the means value for the statements related to the faculty's attitude toward the internationalization project and toward their experience.

Correlational analysis was done between the variable of having international experience teaching, working or studying and the rest of the attitudes beliefs. Table 7 shows the results of the analysis. The only correlation was with the belief that the experience of with certain international initiatives has been rewarding.

Table 7. Correlational analysis between previous international experience and attitudes beliefs toward internationalization

International experience	Correlation	Sample Size	Significance	Strength
With…				
Timing	0.12	28	No	-
Believe in Project	0.27	28	No	-
Experience rewarding	0.57	28	Yes	Weak
Experience enriching	-0.17	28	No	-
Experience challenging	0.00	28	No	-
More incentive to participate	0.17	28	No	-

5. Discussion

In the global landscape that higher education system is operating, academic institutions have to look toward a well-formed internationalization strategy (Billing, 2004; George, 2017). The Case university, due to demographic changes in their local market and an increase in the competition for local students, started several years ago to go out and immerse itself in the global academic environment. It was more a reactive response to threats than a proactive leap to capture opportunities. In order for this internationalization project to be successful, it is critical that the personnel delivering the service, particularly the faculty, understands the project and get involved in it.

Based on the findings of this research, it can be established that most of the faculty knew about the project, even though they had not been actively involved in reading the partnership plan documents where the university's President set the rationale for the project and its long-term goals. Faculty members' knowledge about the internationalization project came through other communication vehicles such as informal communication. As a result of primary reliance upon grapevine, the faculty members did not have a developed understanding of the complete scope of the project. Also, the diversity of opinions reflected more of imperfect information inputs the faculty received rather than their innate biases about internationalization.

The initiative with the greatest awareness was the one with the most exposure in the mainstream media due to its nature (agreement with Chinese government). The second initiative with the highest awareness was the Faculty Resources Network. It had a high exposure to the internal communications network. The other initiatives that had high awareness were those related to programs known at the national level such as the Fulbright Program and the National Exchange Program.

The results show an apathetic faculty, where more than half of the sample has not attended any of the activities related to the internationalization project. This should be a major concern for the top administrators spearheading the internationalization mission. For faculty to participate, the activity should be about what they perceive as an interesting topic and should be related to their courses.

In the present study, faculty members expressed their interest in participating in the Faculty Resources Network and in being a visiting professor in other universities: thus, one way to attract faculty interest in internationalization is to actively seek such opportunities for the faculty members. These two activities involved traveling to other places and getting to know other cultures and the learning the faculty brings back would be valuable, too. To be more involved in the project, faculty members would also like to receive incentives such as sabbatical leaves or reduction in academic load, according to the study. These are generally held expectations, peer institutions offer such incentives, and absence of them will evidently demotivate the faculty.

Another interesting finding was that they were not very enthusiastic when they evaluated their experience in initiatives related to the project or regarding their experience teaching

international students. They expressed a neutral agreement with statements classifying those experiences as enriching, rewarding and challenging. This again was possibly because of the half-baked nature of information they received.

In summary, faculty generally trusted the leadership and generally committed their time and effort to support partnership initiatives. Trust did lead to some commitment. However, in the absence of quality assurance frameworks, institutionalized support structures, and more importantly effective communication, a lot of faculty excitement got dissipated without leading to results.

6. Conclusion

The purpose of this study was to determine the knowledge and beliefs of the faculty about the internationalization project carried out by a small private university based in a US jurisdiction area. In general, faculty exhibited a positive attitude and optimism toward the internationalization project. Faculty members understood the perfect timing for the project would not wait for long and they believed in the promise of internationalization.

When the focus is on external opportunities, institutional risk from partnerships is not always properly evaluated (Shima, George, 2014). New competencies need to be developed institutionally in order to take advantage of external opportunities and faculty embracing the change is crucial here. It could be stated that information is the key driver for faculty support for partnerships: faculty members were knowledgeable about the project but in a very narrow sense. They did not have the complete scope of the project. This limited their beliefs about the value of participation in various internationalization activities. Well defined administrative structures will help communication flow in an organized manner. Leading internationalization with ad hoc committees may help with cost reduction in the short term, but is suicidal strategically.

Based on the survey responses, the researchers also infer that it is necessary to establish incentives for them to participate more actively. Lest, the involvement will be limited to a few intrinsically motivated faculty members. Incentives not necessarily must be monetary but could also be in terms of time for them to be able to attend the different activities.

Before concluding, certain limitations of the study should be indicated. First, there is potential for an innate bias – study respondents who feel negative about the administration's move are likely to be more vocal than those who are neutral or positive. Similar criticisms are often raised about using student ratings to gauge faculty performance (Spooren et al., 2013). However, the researchers of this study did not have a way to normalize this bias. Also, we noticed that many respondents did not have a clear idea of what the exact internationalization related policies were and consequently their responses to some other questions were not well informed. This means there could be validity issues in using such responses as facts and not as mere perceptions. A comparative study of the perceptions of administrators Vs faculty would have better revealed the gaps in perception. We aim to do this iteration sometime in the future. Finally, many of the findings are closely tied to the specific nuances in the Case university and using the findings as guidance for internationalization policy in other university should be attempted with caution. However, we do believe that these findings are valuable general pointers to the larger issue of shared governance in our academic institutions.

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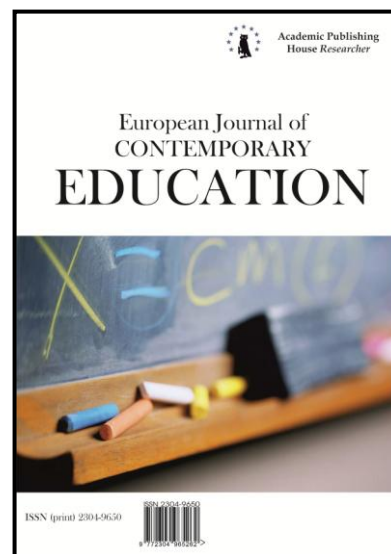
A Tool Called Communicative Curve Applied for Evaluation of Similarities and Differences between Foreign Language Textbooks

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Abstract

In the study, the following research questions are responded: Are there any conception differences within the textbook series? How might the conception influence teaching French? The current study presents the results with implications for teachers of French at secondary schools. It points out some significant markers such as the preference of textbook type activities and arguments for choosing the textbooks.

Keywords: teaching, French as a foreign language, textbooks, activities, similarities, conception, disadvantages.

1. Introduction

The Slovak state language policy and curricula are becoming increasingly important not only in the implementation of instruction but also in the selection of textbooks. Partial results from the empirical research conducted during three years and a survey of textbooks used for teaching French at secondary schools in Slovakia are presented. The research objective is not only to show what types of textbooks are used but to demonstrate that they are often not sufficiently developed in methodology. The methodology should reflect the learners` needs and accommodate the tasks according to the language and communication levels. And this is the objective of the present study: to demonstrate what is the proportion between language-oriented activities and communication-oriented activities, whether the textbooks are conceived similarly or differently and in what perspective they should be conceived differently.

2. Literature Review

Several theories have influenced the research of textbooks so far: Cunningsworth (1995), Besse (1995), Courtillon (2003), Pécheur and Vigner (1995), Repka (1990), Turek (1997), Brumfit

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and Johnson (1989), Dalgalian, Lieutaud and Weiss (1991), Daoud and Celce-Murcia (1979), Lamie (1999), Lee and Vanpatten (2005), Nunan (1989, 1991), Skierso (1991), Thornbury (2006) or Tomlinson (2001), Lojova (2017). Birova (2009, 2016) created the Theory of Communication Curve analysis reflecting the material coverage of everyday class in the form of the proportion between language-based and communication-based activities in the textbooks based on the theory of a balanced approach (Harmer, 1991).

3. Materials and Methods
3.1. Objectives
The primary research objective is to find out whether the typology of activities in the textbooks within one series is similar. The null hypothesis (H_o): "The means of the sets of data are equal" is verified for each textbook series.

3.2. Sample
The following series of textbooks were evaluated:
Panorama 1 and 2
En français 1, 2, 3 and 4
Libre Échange 1 and 2
Café crème 1 and 2
Forum 1 and 2
Espaces 1 and 2
Francúzsky jazyk pre stredné školy 1, 2, 3 and 4
Le nouveau sans frontières 1 and 2
One randomly chosen unit from each textbook was analyzed and compared to the unit chosen from the other textbook/s within the series.

3.3. Methods
The content analysis was invented by the author (Birova, 2009, 2016) and applied to evaluate textbooks used for teaching French as a foreign language from the communicative and language point of view.

3.4. Procedure
The statistical significance (t-test) in Excel was used to answer the hypothesis. A statistically significant t-test result is one in which a difference between two groups is unlikely to have occurred because the sample happened to be atypical. Statistical significance is determined by the size of the difference between the group averages, the sample size, and the standard deviations of the groups. For practical purposes, the statistical significance suggests that the books from which we sample are different or similar. The t-test's statistical significance indicates whether or not the difference between two groups' averages most likely reflects a "real" difference in the chosen units of textbooks from which the groups were sampled. The t-test's effect size complements its statistical significance, describing the magnitude of the difference, whether or not the difference is statistically significant.

The statistical method of ANOVA (analysis of variance) in Excel was used in order to determine whether the means of the groups were different. ANOVA uses F-tests to statistically test the equality of means, it is a ratio of two variances (a measure of dispersion, or how far the data are scattered from the mean). In this post, it will be shown how variances provide information about the means. Larger values represent greater dispersion. Variance is the square of the standard deviation. Standard deviations are easier to understand than variances because they are in the same units as the data rather than squared units. However, many analyses actually use variances in the calculations.

The evaluation procedure was carried out as follows. All activities were evaluated from randomly selected lessons. Activities were assigned to seven points of the communication curve. Seven points determine the degree of communication on a Communication curve. The first point indicates that the activity is language-oriented, linguistically closed, and the learner does not communicate, only practice the grammatical, phonetical, lexical or orthographic matters. The second point indicates that the activity is closed, with a closed response. The learner practices a chosen sociolinguistic or socio-cultural aspect. The third point is associated with linguistically closed activities, in which learners practice pragmatic contents such as speech acts, mini-dialogues, the language in restricted communication. To the fourth point of the curve, we include activities

that are contextually closed or semi-closed. The contextual role consists of training receptive skills, not productive ones. So, most often, at this point, it goes on reading or listening comprehension activities. The fifth point represents the tasks in which the learner works with a context in which sociolinguistic or socio-cultural aspects and intercultural communication are practiced. In the 6th point of the curve, it is typical to work with micro-contexts, speech acts. The 7th point of the curve is considered to be the point where learners focus on communication, writing, continuous production (monologue) and oral interaction.

Determining the degrees of communicability in individual tasks was the pre-research phase of comparing textbook series. The aim was to find out whether textbooks which follow on have a diverse range of tasks within the ranks of the different grades and levels of the series of textbooks that were measured. If the statistical test reveals that textbooks are similar, it means that textbooks at a higher linguistic and cognitive level do not require more communication from the learner and are not conceived progressively. On the other hand, if statistics prove that they are different, they predetermine the communication continuum and progress.

4. Results
Panorama 1 and 2 textbooks

F-Test Two-Sample for Variances

	Variable 1	Variable 2
Mean	4,055555556	3,818182
Variance	6,408496732	5,298701
Observations	18	22
df	17	21
F	1,209446687	
P(F<=f) one-tail	0,33574712	
F Critical one-tail	2,138872329	

t-Test: Two-Sample Assuming Equal Variances

	Variable 1	Variable 2
Mean	4,055555556	3,818182
Variance	6,408496732	5,298701
Observations	18	22
Pooled Variance	5,795188729	
Hypothesized Mean Difference	0	
df	38	
t Stat	0,310253345	
P(T<=t) one-tail	0,379031787	
t Critical one-tail	1,685954461	
P(T<=t) two-tail	0,758063574	
t Critical two-tail	2,024394147	

Fig. 1. Variance of Panorama 1 and 2 textbooks

First, the *F*-test proved that two sets of data compared have equal variance ($F = 1.209 < F_{crit} = 2.138$). The two-sample *t*-test of unequal sample size ($n_1 = 18$, $n_2 = 22$) and assuming equal variances was used to determine if the two sets of data are significantly different from each other. The *t*-value (0.310) and the degrees of freedom for the total sample size were determined ($df = 38$), so the *p*-value could be found. The calculated *p*-value (0.758) is above the statistical significance ($\alpha = 0.05$), so H_o is proved – the variances are identical which means that the textbooks are conceived similarly.

En français 1, 2, 3, 4 textbooks

Anova: Single Factor

SUMMARY

Goups	Count	Sum	Average	Variance
Column 1	28	52	1,857142857	3,904761905
Column 2	39	120	3,076923077	6,862348178
Column 3	25	70	2,8	6
Column 4	40	176	4,4	4,194871795

ANOVA

Source of Variance	SS	df	MS	F	P-value	F crit
Between Group	112,5355311	3	37,51184371	7,126048763	0,000183	2,675387
Within Group	673,7978022	128	5,26404533			
Total	786,3333333	131				

Fig. 2. Variance of En français 1, 2, 3 and 4 textbooks

The Analysis of variance (ANOVA) was used to test if the means of more than two groups are equal. This was the case of a single factor, unbalanced data, and fully randomized experiment. The groups were summarized by the number of experimental units (n_1 = 28, n_2 = 39, n_3 = 25, n_4 = 40), sums, means and variance. The between-group sum of squared differences (SS = 112.535), the degrees of freedom (df = 3) and mean square value (MS = 37.511) were calculated. Then the within-group sum of squares (SS = 673.797), the degrees of freedom (df = 128) and the mean square value (MS = 5.264) were calculated. Since the F = 7.126 > F_{crit} (2.675) at α = 0.05 the values in groups differ. This means that the textbooks are conceived differently, and H_o is rejected.

Libre Échange 1 and 2 textbooks

F-Test Two-Sample for Variances

	Variable 1	Variable 2
Mean	4,371428571	3,3
Variance	4,357983193	4,326316
Observations	35	20
df	34	19
F	1,007319716	
P(F<=f) one-tail	0,508220957	
F Critical one-tail	2,050356537	

t-Test: Two-Sample Assuming Equal Variances

	Variable 1	Variable 2
Mean	4,371428571	3,3
Variance	4,357983193	4,326316
Observations	35	20
Pooled Variance	4,346630728	
Hypothesized Mean	0	

Difference		
df	53	
t Stat	1,833388596	
P(T<=t) one-tail	0,036181574	
t Critical one-tail	1,674116237	
P(T<=t) two-tail	0,072363148	
t Critical two-tail	2,005745949	

Fig. 2. Variance of En français 1, 2, 3 and 4 textbooks

First, the *F*-test proved that two sets of data compared have equal variance ($F = 1.007 < F_{crit} = 2.050$). The two-sample *t*-test of unequal sample size ($n_1 = 35$, $n_2 = 20$) and assuming equal variances was used to determine if the two sets of data are significantly different from each other. The *t*-value (1.833) and the degrees of freedom for the total sample size were determined ($df = 53$), so the *p*-value could be found. The calculated *p*-value (0.072) is above the statistical significance ($α = 0.05$), so H_o is proved – the variances are identical which means that the textbooks are conceived similarly.

Café crème 1 and 2 textbooks

F-Test Two-Sample for Variances

	Variable 1	Variable 2
Mean	3,5	4,317073
Variance	5,431034483	4,071951
Observations	30	41
df	29	40
F	1,333767079	
P(F<=f) one-tail	0,197030675	
F Critical one-tail	1,751294109	

t-Test: Two-Sample Assuming Equal Variances

	Variable 1	Variable 2
Mean	3,5	4,317073
Variance	5,431034483	4,071951
Observations	30	41
Pooled Variance	4,643160127	
Hypothesized Mean Difference	0	
df	69	
t Stat	-1,578256189	
P(T<=t) one-tail	0,059540335	
t Critical one-tail	1,667238549	
P(T<=t) two-tail	0,119080671	
t Critical two-tail	1,99494539	

Fig. 2. Variance of En français 1, 2, 3 and 4 textbooks

First, the *F*-test proved that two sets of data compared have equal variance ($F = 1.333 < F_{crit} = 1.751$). The two-sample *t*-test of unequal sample size ($n_1 = 30$, $n_2 = 41$) and assuming equal variances was used to determine if the two sets of data are significantly different from each other. The *t*-value (-1.578) and the degrees of freedom for the total sample size were determined ($df = 69$), so the *p*-value could be found. The calculated *p*-value (0.119) is above the statistical significance

(α = 0.05), so H_0 is proved – the variances are identical which means that the textbooks are conceived similarly.

Forum 1 and 2 textbooks

F-Test Two-Sample for Variances

	Variable 1	Variable 2
Mean	3,790323	4,344262
Variance	4,561872	5,796175
Observations	62	61
df	61	60
F	0,787049	
P(F<=f) one-tail	0,176874	
F Critical one-tail	0,653206	

t-Test: Two-Sample Assuming Unequal Variances

	Variable 1	Variable 2
Mean	4,344262	3,790323
Variance	5,796175	4,561872
Observations	61	62
Hypothesized Mean Difference	0	
df	119	
t Stat	1,349076	
P(T<=t) one-tail	0,089937	
t Critical one-tail	1,657759	
P(T<=t) two-tail	0,179874	
t Critical two-tail	1,9801	

Fig. 5. Variance of Forum 1 and 2 textbooks

First, the *F*-test proved that two sets of data compared have unequal variance (F = 0.787 > F_{crit} = 0.653). The two-sample *t*-test of unequal sample size (n_1 = 61, n_2 = 62) and assuming unequal variances was used to determine if the two sets of data are significantly different from each other. The *t*-value (1.349) and the degrees of freedom for the total sample size were determined (df = 119), so the *p*-value could be found. The calculated *p*-value (0.179) is above the statistical significance (α = 0.05), so H_0 is proved – the variances are identical which means that the textbooks are conceived similarly.

Espaces 1 and 2 textbooks

F-Test Two-Sample for Variances

	Variable 1	Variable 2
Mean	4,568181818	3,117647
Variance	5,506871036	5,561497
Observations	44	34
df	43	33
F	0,990177773	
P(F<=f) one-tail	0,482302112	
F Critical one-tail	0,586225517	

t-Test: Two-Sample Assuming Unequal Variances

	Variable 1	Variable 2
Mean	3,117647059	4,568182
Variance	5,561497326	5,506871
Observations	34	44
Hypothesized Mean Difference	0	
df	71	
t Stat	-2,699494691	
P(T<=t) one-tail	0,004336912	
t Critical one-tail	1,666599659	
P(T<=t) two-tail	0,008673824	
t Critical two-tail	1,993943341	

Fig. 6. Variance of Espaces 1 and 2 textbooks

First, the *F*-test proved that two sets of data compared have unequal variance ($F = 0.990 > F_{crit} = 0.586$). The two-sample *t*-test of unequal sample size ($n_1 = 34$, $n_2 = 44$) and assuming unequal variances was used to determine if the two sets of data are significantly different from each other. The *t*-value (-2.699) and the degrees of freedom for the total sample size were determined ($df = 71$), so the *p*-value could be found. The calculated *p*-value (0.008) is below the statistical significance ($\alpha = 0.05$), so H_o is rejected – the variances are not identical which means that the textbooks are conceived differently.
Francúzsky jazyk pre stredné školy 1, 2, 3, 4 textbooks

Anova: Single Factor

SUMMARY

Groups	Count	Sum	Average	Variance
Column 1	29	51	1,75862069	3,189655172
Column 2	16	32	2	3,466666667
Column 3	13	71	5,461538462	1,602564103
Column 4	1	0	0	#DIV/0!

ANOVA

Source of Variance	SS	df	MS	F	P-value	F crit
Between Group	139,4927842	3	46,49759475	15,92967463	1,41783E-07	2,772537
Within Group	160,5411141	55	2,918929347			
Total	300,0338983	58				

Fig. 7. Variance of Francúzsky jazyk pre stredné školy 1, 2, 3 and 4 textbooks

The Analysis of variance (ANOVA) was used to test if the means of more than two groups are equal. This was the case of a single factor, unbalanced data, and fully randomized experiment. The groups were summarized by the number of experimental units ($n_1 = 29$, $n_2 = 16$, $n_3 = 13$, $n_4 = 1$), sums, means and variance. The between-group sum of squared differences ($SS = 139.492$), the degrees of freedom ($df = 3$) and mean square value ($MS = 46.497$) were calculated. Then the within-group sum of squares ($SS = 160.541$), the degrees of freedom ($df = 55$) and the mean square value ($MS = 2.918$) were calculated. Since the $F = 15.929 > F_{crit}$ (2.775) at $\alpha = 0.05$ the values in groups differ. This means that the textbooks are conceived differently, and H_o is rejected.

Le nouveau sans frontières 1 and 2 textbooks

F-test Two-Sample for Variances

	Variable 1	Variable 2
Mean	3	2
Variance	6,6	3,52381
Observations	31	22
df	30	21
F	1,872972973	
P(F<=f) one-tail	0,069253432	
F Critical one-tail	2,0102483	

t-Test: Two-Sample Assumineg Unequal Variances

	Variable 1	Variable 2
Mean	3	2
Variance	6,6	3,52381
Observations	31	22
Hypothesized Mean Difference	0	
df	51	
t Stat	1,637197676	
P(T<=t) one-tail	0,053872866	
t Critical one-tail	1,675284951	
P(T<=t) two tail	0,107745731	
t Critical two-tail	2,007583728	

Fig. 8. Variance of Le nouveau sans frontières 1 and 2 textbooks

First, the *F*-test proved that two sets of data compared have equal variance ($F = 1.872 < F_{crit} = 2.010$). The two-sample *t*-test of unequal sample size ($n_1 = 31$, $n_2 = 22$) and assuming equal variances was used to determine if the two sets of data are significantly different from each other. The *t*-value (1.637) and the degrees of freedom for the total sample size were determined ($df = 51$), so the *p*-value could be found. The calculated *p*-value (0.107) is above the statistical significance ($α = 0.05$), so H_0 is proved – the variances are identical which means that the textbooks are conceived similarly.

5. Discussion
In the study, the research questions were responded:
- conception differences within the textbook series,
- the influence of conception on teaching French.

Series of textbooks for teaching French	H₀ proved	H₀ rejected
Panorama 1 and 2	x	
En français 1, 2, 3, 4		x
Libre échange 1 and 2	x	
Café crème 1 and 2	x	
Forum 1 and 2	x	
Espaces 1 and 2		x
Francúzsky jazyk pre stredné školy 1, 2, 3, 4		x
Le nouveau sans frontières 1 and 2	x	
Discussed conclusions	*5 series of textbooks are conceived similarly.*	*3 series of textbooks are conceived differently.*

6. Conclusions

The current study presented the results with implications for teachers of French at secondary schools. It pointed out some significant markers such as preferences for activities in French textbooks and arguments for choosing the textbooks. The content analysis of the series of textbooks proved that only three series of textbooks are conceived differently from the point of view of the typology of activities. Five series of textbooks are conceived similarly which means that the textbooks do not offer a learner the communicative progress. *Libre échange* textbooks are conceived communicatively from the beginning (0 level), vice versa, *Francúzsky jazyk pre stredné školy* follows the techniques of the audio-lingual method and is conceived differently, but three levels focus much on practicing linguistics means. *En français* textbooks is conceived differently and shows a good proportion of activities. Nevertheless, it shows no authentic reading materials. *Espaces* are conceived well, yet, published 20 years ago, the textbook is not in mode any more.

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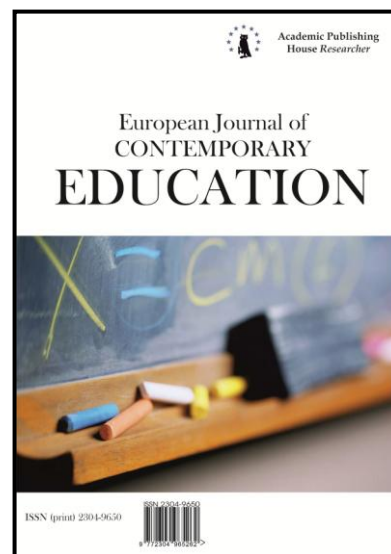
Development of Foreign Language Lexical Competence on the Basis of a Learner's Terminological Thesaurus and Dictionary

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Abstract

The article suggests a method of foreign language lexical competence development on the basis of a Learner's terminological thesaurus and dictionary of software terms which includes four main components: classification part demonstrating the inner logic of the subject area, glossary with definitions of key terms, thesaurus demonstrating logical and associative relations of the key terms, and bilingual alphabetical dictionary. The thesaurus and dictionary has an extended context part supplemented with an encyclopedic part on the main topics of the thesaurus. The stages of the development and the structure of the Thesaurus and dictionary are described. Pedagogical experiment was conducted and proved high efficiency of the method proposed.

Keywords: lexical competence, learner's thesaurus and dictionary, learner's dictionary development, structure of a learner's dictionary.

1. Introduction

Occupational mobility of a professional is impossible without knowledge of a foreign language. The proficiency in any foreign language is determined, first of all, by lexical competence as it is the lack of vocabulary and lexical errors that can lead to communicative failure and misunderstanding (Shamov, 2005; Lewis, 1993; Meara, 1996 et al.). Lexical competence is especially important for non-English-speaking IT-specialists because English is a recognized language of communication and documentation in this area, and certification exams can be taken only in English. Besides, IT-specialists often work as freelancers and take part in English-speaking professional communities. To form lexical competence in an occupational field, it is necessary to

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select key terminology of this field and to determine the most important semantic relations between key terms as well as between the key terms and other words of the language.

One of the first linguists, who tried to describe what it means to 'know a word', was J. Richards (Richards, 1976). According to him, knowing a word isn't limited to the knowledge of its meanings and word forms, its derivatives, but also includes the knowledge of its syntactic behavior and the net of associations of the word with other words. Describing lexical knowledge, P. Meara (Meara, 1996) emphasizes such aspects as vocabulary size, the number of lexical units which a person knows, and vocabulary organization, how these words are connected to each other. He notes that the bigger the vocabulary size is, the higher the significance of the system of relations and associations between words.

The importance of associative relationships is also emphasized in scientific papers on psychology (I.A. Zimnyaya), psycholinguistics (A.A. Leontiev, A.A. Zalevskaya), linguistics (V.A. Zvegintsev, Yu.N. Karaulov), and foreign language teaching methodology (E.I. Passov, T.S. Serova). It is emphasized that the net of relations among words cannot be transferred from the native language, but must be formed anew. To learn a foreign word, it is necessary to acquire the potential system of its semantic relations (Serova, 1989). Lexical competence development should therefore be based on revealing and determining these relations.

Thus, the development of lexical competence as *knowledge of, and ability to use, the vocabulary of a language*, consisting *of lexical and grammatical elements* (Common European Framework of Reference for Languages) (Common European Framework...: 110) is based on the development of conceptual and categorical system of the related subject area, and hence, the acquisition of its terminology and the system of paradigmatic and syntagmatic relations of its key terms. The development of the occupational foreign language lexical competence should be carried out on the basis of a learner's dictionary which presents the terminology of a subject area and shows semantic relations of its key terms, in other words, a thesaurus (Linguistic Encyclopedic Dictionary, 1990: 506-507) and dictionary. To develop such a dictionary, it is necessary to analyze the subject area, to sort out the relations of its key terms, and to determine their most important paradigmatic and syntagmatic relations.

2. Literature review

The first '*Thesaurus of English Words and Phrases*', in which vocabulary of the English language was classified in groups, was created by P.M. Roget and first published in 1952. Since then it has been revised many times and enriched with new words and connotations. In the XXth century, thesaurus became an information retrieval tool. Unification of thesauri took place in the context of coordination of information retrieval systems. In turn, information retrieval system development has contributed to increased development of specialized thesauri.

According to Yu.N. Karaulov, a thesaurus must have four potential entries (Karaulov, 1981: 148-166). The systematic part of a thesaurus includes descriptors (key words which have their descriptive entries) and non-descriptors (words which do not have any descriptive entries and which are subordinate to the main descriptor). This part represents the connection between a concept and a sign. The classification scheme of a thesaurus reproduces the structure of a particular subject area and provides the transition between words, from a descriptor to the descriptive unit, and from this unit to an adjacent subject area and vice versa. This part represents the connection between concepts. The third thesaurus entry shows the connection between the sign and the concept. The words are listed in alphabetical order with their address in the conceptual fields. The fourth part is permutation index which includes all the words of the thesaurus in alphabetical order. It is used for facilitated and accelerated search of terms and their combinations and demonstrates the connection between signs.

There are 13 lexicographic parameters which determine the ideographic character of a dictionary (Tabanakova, 2001: 69-70), among them are synonymy, antonymy, including semantic fields and thematic groups in the dictionary as they show system relations between concepts. But the main parameter is the availability of different "entries in the dictionary" as it reflects the method of vocabulary organization. The most famous monolingual (Longman Dictionary of Contemporary English; Oxford Living Dictionaries; Oxford Advanced Learner's Dictionary; Macmillan Dictionary; Dictionary; Cambridge Dictionaries; The free dictionary; Collins Dictionary) and the most popular in Russia multilingual online dictionaries (ABBY Lingvo; Multitran) contain

semantic relations (synonyms, derivatives, associative relations) as an integral component, which brings thesauri and dictionaries closer.

Thesauri are widely used in learning process, in particular, in foreign language teaching (Arkhipova, 2009; Chainikova, 2014; Shishkina, 1992 et al.). They make it possible to represent logical-conceptual and semantic relations of a terminological system (Yu.N. Karaulov, T.S. Serova, V.D. Tabanakova et al.). Due to the fact that the thesaurus contains the core of special knowledge and is a concentrated expression of an academic discipline, it promotes the mastering of conceptual and terminological system of the field studied and the development of student's professional thinking.

Learner's bilingual thesauri have been developed within Perm methodological school. The thesaurus is considered to be a method of arranging, introducing and consolidating knowledge of a subject area as a system of lexical means in their interconnections and relations (T.S. Serova, E.I. Arkhipova, L. P. Shishkina, G. R. Chainikova et al.). A terminological thesaurus built in this way is based on semantic relations of words which are arranged as a multitier structure, reflecting extralinguistic reality. Its unit is a semantic field, not a word (Dubichinsky, 1998: 79). This allows us to build the system of logical relations and increase the learning effect. The purpose of a thesaurus development is to systematically arrange the concepts and the vocabulary of an occupational field, to represent the most important paradigmatic and syntagmatic relations of key terms. The main purpose of such a dictionary is to be "a tool for selecting a word" (Yu.N. Karaulov), and its application in the learning process should result in the development of the foreign language professional mental lexicon.

The thesaurus and dictionary developed within Perm methodological school includes four components.

1. Classification part. It consists of charts which demonstrate the inner logic of the subject area, reveal the meaning and essential relations of its key terms. This thematic and logical structure shows a key term as a part of the terminological system and makes it possible to give students the general idea of the topic and the hierarchy of semantic relations in it (Serova, 2015: 179).

2. Glossary. It contains definitions of the most important terms of the subject area described. Definition as a micricontext relates the term to a whole group, class of items, phenomena, processes, on the one hand, and demonstrates this term in connection with other words of the language, reveals its relations both at paradigmatic and syntagmatic levels, on the other. From an educational point of view, definition as a context is a means of enriching the meaning of a term (Zatonskiy, 2012: 132).

3. Ideographic part (Thesaurus). Each thesaurus entry demonstrates the relations of the entry term at paradigmatic and syntagmatic levels. Vocabulary arranged around the entry term characterizes the concept and constitutes its 'implicit definition' (Yu.N. Karaulov). The relations presented in the thesaurus entry should be essential, regular, and systematic for a group of texts within a certain subject area. To form a student's foreign language mental lexicon as a property of his or her speech ability, it is important to demonstrate logical and associative relations of terms as each word is not only an image of an object but also a system of potential relations which this object can have (Luriya, 1970). A word gets its meaning only as a part of a lexical-semantic group. It is also important that each word in the mental lexicon has links with many others and all the words are arranged into networks, therefore mastering a word will depend on the number of relations of this word in the mental lexicon, their depth and nature (Zalevskaya, 1978; Aitchinson, 1987).

4. Alphabetical dictionary. A bilingual dictionary which contains all the words, presented in the ideographical part.

3. Materials and methods
Development of the model of the *Learner's English-Russian and Russian-English Electronic Thesaurus and Dictionary of Software Terms*

The development of the *Learner's English-Russian and Russian-English Electronic Thesaurus and Dictionary of Software Terms* was organized into four stages: 1) designing; 2) selecting sources for the Thesaurus and dictionary; 3) logical and conceptual analysis of the material selected, developing classification schemes and thesaurus, forming the glossary and compiling the dictionary; 4) implementation of an electronic version and experimental validation.

Designing

The *Learner's thesaurus and dictionary of software terms* was targeted students majoring in Software Engineering. The aim was to develop a concise thesaurus and dictionary of software terms containing about 1000 terms and related words. The requirements to the *Thesaurus and dictionary* were determined, the main being selection of lexical means in accordance with the requirements of curricula, taking into consideration the level of education and the context of students' future occupational activity; integrated description of lexical units, arranging and structuring the terms on the bases of logical and conceptual relations in the terminological system; different "entry points" to the dictionary which allow the user to switch from a word to the concept, and from a concept to the word; singling out key terms of the subject area and their multilevel description, including glossary definitions; increased context part of the dictionary; openness, e.g. the possibility to make changes and to supplement.

Selecting sources for the Thesaurus and dictionary and making a word-list

This part of work includes systematic classification of the subject area, which, in turn, can be divided into three stages (Manual…, 1995: 83-84): 1) an external subject classification with a view to identifying the text material which is to form the empirical basis of the dictionary; 2) an internal subject classification, forming the basis of the systematic structuring and establishing the hierarchy of logical relations between the individual elements; 3) a terminological classification, a systematic listing of the terms of the subject field in question.

The main requirements to the sources for the *Thesaurus and dictionary of software terms* were: the sources should be reliable and generally accepted; chronological adequacy (relevance); reasonable time for obtaining and handling information (Kudashev, 2007: 312-313), as well as authenticity of texts analyzed. The main sources were therefore terminological standards, encyclopedias, reference books, text books, explanatory dictionaries, as well as articles in specialized journals and on corresponding websites. On the basis of the analysis, a global chart of the subject area was created.

The main criteria for including a term into the thesaurus were: semantic value of the term, frequency of use, belonging to the terminological system of the subject area in question, synchronism, derivational value (ability to build a word-family), collocability (Grinev-Grinevich, 2009: 96). The frequency criterion is especially important if the dictionary also includes terms from adjacent fields and words of general language.

Logical and conceptual analysis of the material selected, developing the structure of the *Thesaurus and Dictionary*

As the result of the logical and conceptual analysis, the topics to be included into the thesaurus were selected. As we intended to make a concise thesaurus, the area covered was limited to the most general topics, as well as some topics, studied in the first and second years of the course (Fig. 1)
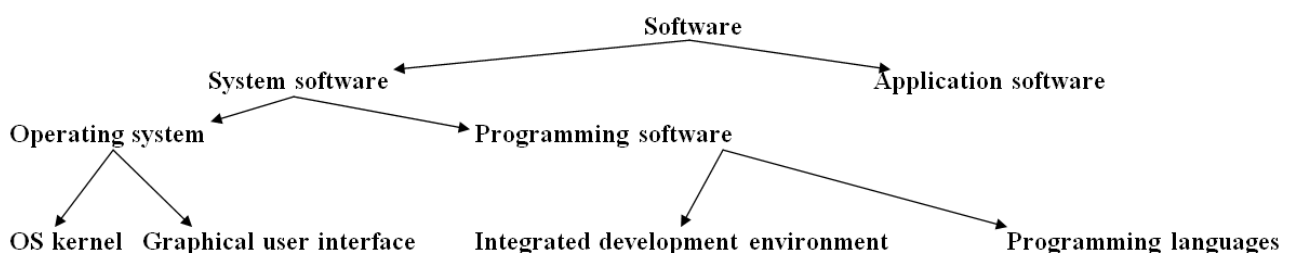
Fig.1. Topics, included into the thesaurus

In addition to the topics, presented in Fig. 1, the thesaurus also includes *Software licensing* and *Software piracy* sections.

Each topic was presented in the form of a classification scheme (Fig. 2).
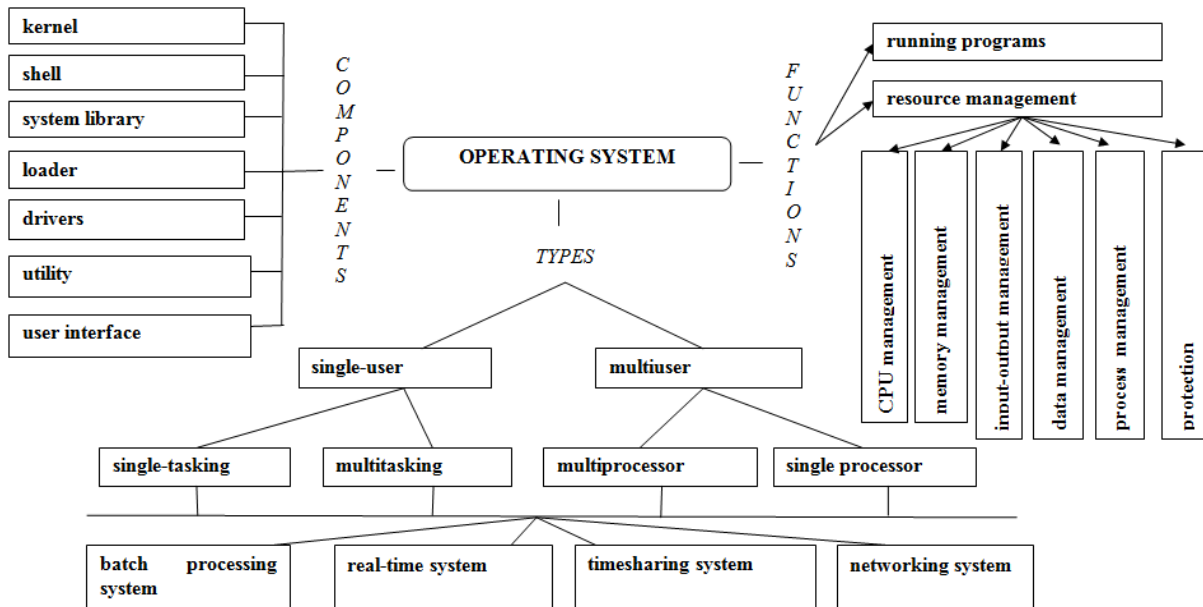
Fig. 2. Example of the classification scheme on "Operating systems"

After that, the vocabulary selected was grouped into topics around the key terms on the basis of semantic relations. Along with paradigmatic relations (synonymy, antonymy, hierarchic relations), we also included associative relations which play an important part on the syntagmatic level. The most typical relations for the area of software are: action – agent, action – object, action – tool, action – mode of action, action – function, action – result, object – property/quality/ quantitative characteristic, object – location. To select the relations on the syntagmatic level, frequency criterion was used. The vocabulary selected was grouped around the entry term in the thesaurus (Fig. 3).

Fig. 3. Example of a thesaurus entry

All the terms presented in the classification schemes were included into the glossary. In total the glossary contains 67 terms with their definitions.

Alphabetical English-Russian and Russian-English dictionaries include all the lexical means presented in the classification schemes and the thesaurus. While compiling a bilingual translation dictionary, one of important issues is how to present terminological word-combinations which can be presented as independent entries or grouped together. We have combined both approaches in

the dictionaries, which speeds up the search of a terminological combination, on the one hand, and makes it possible to show the connection between the main term and its combinations, on the other.

Working on the *Thesaurus and dictionary*, we took the decision to expand its context part. Along with examples of word-combinations and sentences, we included an encyclopedic part on the main topics of the thesaurus (Fig. 4). It allows us to actualize the thesaurus entries, demonstrate how paradigmatic and syntagmatic relations of the key terms work in texts.

Fig. 4. Example of a text in the encyclopedic part

The *Thesaurus and Dictionary* also contains supplements: information on the meaning of English prefixes and suffixes, and how to read characters.

The electronic model of the *Thesaurus and Dictionary* was developed using Microsoft FrontPage 2003, a HTML editor and Web site administration tool (Chainikova, 2014).

4. Results and Discussion

The experimental work was conducted at the Berezniki Branch of Perm National Research Polytechnic University. 116 students of the second-year of study majoring in software engineering and studying the subject "English for professional purposes" took part in experimental learning.

A special complex of exercises for developing foreign language lexical skills and speech abilities (informative reading, monological speaking) was developed. This complex is based on four interrelated stages of lexical skills and speech abilities development: 1) semantization and reproduction of lexical means; 2) stereotyping and varying of lexical means; 3) systematic application of FL lexical skills, their dynamic integration with other speech skills during oral and written communication; 4) synthesis and systematization of FL lexical skills at the stage of development of creative speech abilities (Serova, 1989: 121-122).

During the first and the second stages, *The Thesaurus and Dictionary* is used as an external informative basis, as a means of development of the conceptual system expressed through foreign language words with their multiple relations. The primary purpose and the result of this work is to develop the FL mental lexicon of the students. At the following stages the *Thesaurus and Dictionary* is used as a source of additional information, and when needed, as an external informative basis.

To check the efficiency of the elaborated methods, pre-test, mid-tests and post-test were conducted. Lexical skills development was assessed on the basis of results achieved in the assignments: 1) lexical assignments without any communication situation: a) creating a mind map, b) exclude the word which doesn't correspond to the topic (odd one out), c) find a synonym, d) match the term and its definition, e) cloze-test; 2) informative reading assignments presupposing performing lexical operations: a) write out key words from the text, b) write a summary of the text as theme-rheme scheme; 3) monological speaking assignments presupposing performing lexical operations: a) give the definition of a term, b) speak on the topic (describe/ characterize/ explain ...).

When evaluating the results, the success rate was determined in accordance with the formula $Q=a/n$, where a – number of tasks done properly, n – the general number of tasks. Q below 0,5 was assessed as insufficient, 0,51–0,79 – a sufficient level, more than 0,8 – a high level.

The work involved three stages:

1. Pre-test, which included assignments without any communication situation as well as a questionnaire to determine the initial level of lexical skills development.

2. Experimental learning with mid-tests and a post-test including the three types of assignments.

3. Analyzing the results of the experimental learning.

According to the results, 95 % of participants showed sufficient and high levels of lexical skills and speech abilities at the end of the course.

In addition to the experimental learning, a pedagogical experiment was conducted. The experimental group included 17 students, the control group – 15 students. The results of the experiment are presented in the table (Table 1).

Table 1. Results of the post-test

Type of assignment		experimental group		control group	
		$Q≥0,51$	$Q<0,51$	$Q≥0,51$	$Q<0,51$
Assignments without any communication situation		15	2	12	3
Receptive lexical skills	Writing out key words from the text	16	1	13	2
	Writing a summary of the text as a theme-rheme scheme	15	2	11	4
Productive lexical skills	Giving the definition of a term	16	1	12	3
	Monologic speaking	15	2	10	5

To statistically process the data, we used Fisher's exact tests and Cochran-Mantel-Haenszel test. The latter one is suitable for the analysis of experiments, conducted multiple times or in different conditions. The null hypothesis in this case is that the relative proportions of one variable are independent of the other variable within the repeats. In other words, there is no consistent difference in proportions in the tables of experimental data. In addition to testing the null hypothesis, the Cochran-Mantel-Haenszel test also produces an estimate of the common odds ratio, how big the effect is when pooled across the different repeats of the experiment. Technically, the tests were implemented in freeware R environment.

The result of Cochran-Mantel-Haenszel test:

```
Mantel-Haenszel X-squared = 5.2212, df = 1, p-value = 0.02231
alternative hypothesis: true common odds ratio is not equal to 1
95 percent confidence interval: 1.147503 7.113937
sample estimates: common odds ratio 2.857143
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shows that P-value is equal to 0.02231. This means that the connection to the application of the method is strong after correction for the strata.

Fisher test allows to check how efficient the method is within strata:

Lexical assignments without any communication situation
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Fisher test p-value:  0.6454394
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Writing out key words from the text
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Fisher test p-value:  0.5887097
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Writing a summary of the text as a theme-rheme scheme
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Fisher test p-value:  0.3828019
```

Giving the definition of a term
```
Fisher test p-value:  0.3192436
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Monologic speaking
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Fishertestp-value:  0.2094611
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shows that there is almost no difference in the proportions within strata.

The results of the pedagogical experiment thereby are sufficiently reliable and prove the effective use of the *Learner's thesaurus and dictionary* as a mean of a foreign language lexical competence development.

5. Conclusions

The development of foreign language professional mental lexicon is based on the development of conceptual and categorical system through the formation of a network of key terms of a subject area which have strong relations to each other and to other words of the second language. The most effective means of developing lexical competence can be a learner's terminological thesaurus and dictionary which includes four main components: 1) classification part, 2) ideographic part (thesaurus), 3) glossary, 4) bilingual dictionary. Its application makes it possible: 1) to develop student's knowledge in a particular subject area; 2) to develop terminological competence of a future specialist; 3) to demonstrate potential relations of key terms of a subject area (syntagmatic and paradigmatic). Expanding its context part due to increased number of examples of word-combinations and sentences as well as including specially selected texts in the encyclopedic part allows us to demonstrate how different functions of lexical items are implemented in text. Full implementation of the functions of the learner's thesaurus and dictionary is possible only in electronic format.

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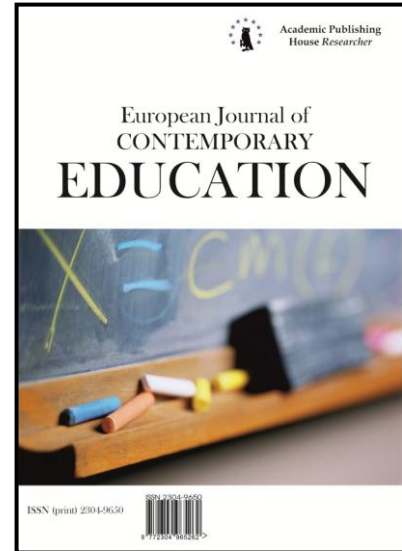
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Abilities of 4−7 years old Children to Provide Independent Explanations and Generalisations of Causality

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Abstract
The understanding and generalisation of causality are important thinking abilities, as they form the basis for a person's activity. Researchers exploring these abilities do not have a unified opinion regarding the age of children when they develop causative understanding and its determinant factors (e.g. age, prior knowledge, the content of a task, etc.). The aim of the current research is to investigate the abilities of 4−7-year-old children to explain causative relations and independently generalise them. An original experiment using spatial figures of animals was chosen for the research. 66 pre-school children participated in the research, each group being represented by 22 children (4−5-year old, 5−6-year old, and 6−7-year old respectively). The research results revealed that pre-school children (4−7-year old) are able to distinguish and explain causative relations. Besides, no difference was determined between the children's abilities to explain and generalise causalities in relation to age (4−5, 5−6, and 6−7). It is assumed that the children of different age understand causal structures in the same way when the spatial figures of animals, which are close and familiar to children, are used as simulation material in the research. The obtained results of the experiment are discussed in the context of the works of other researchers.
Keywords: Pre-school children, abilities to explain and generalise, causal relations.

1. Introduction

Understanding of causality is the fundamental of human thinking and actions. According to Gopnik et al. (2004), this ability helps children to better perceive the results of the accomplished actions, which enables them to acquire a greater sense of the environment control. Some scholars (Legare, 2012; Schulz, Bonawitz, 2007) claim that while playing children are able to distinguish causal relations; however, there is no unanimous opinion at what age children develop causal

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understanding. A part of the scholars maintain that the older the child, the better he or she is able to employ causal relations (Piaget, 1929; Sobel, Buchanan, 2009; Göksuna et al., 2010). Other studies demonstrate that having an opportunity, younger children tend to employ more varied causal choices when solving tasks (e.g. Wellman, 2011; Bright, Feeney, 2014; Legare, Lombrozo, 2014). However, it remains unclear at what age children develop this ability and what factors it depends on (e.g. age, prior knowledge, contradictions in tasks, etc.). It is noteworthy that a child's ability to explain and generalise causal relations have not been explored in Lithuania. The analysed studies do not contain such an experiment which would reveal how a child explains and generalises causality. Hence, the aim of the current research is to explore the abilities of 4–7-year old children to explain causal relations and generalise them independently. The object of the research is the abilities to explain and generalise causal relations. An original experiment has been chosen as the research method.

The significance of understanding causality. Persons think and act realising causal relations, i.e. why some events cause others. These events become understandable to us when we become aware of particular causal properties. For instance, a car key (perceived as a cause) unlocks the car door (result) as it causes the start of a particular mechanism (Sobel, Buchanan, 2009). Michotte (cited from Schlottmann et al., 2002) was the first to explore causative relations, where an event was assessed as caused by another event even without the involvement of physical objects. The author maintains that causality can be defined as an ability to understand events caused by other events. According to Gopnik et al. (2004), an ability to understand causes helps a child to successfully foresee future events and understand the results of an accomplished action. It is obvious that children themselves cannot always relate the cause to the result; yet, according to Field and Lawson (2008), if children are provided with causal explanations when explaining some information, the information is understood in a much easier way in comparison to situations when information is provided without any causative relation. Ahn et al. (2000) determined that the answers to the tasks performed by 7–9-year old children, which included some kind of categorisation, were largely influenced by a particular function that was caused by other functions (causality) rather than other features devoid of causality. It means that the understanding of causal relations is important for reasoning and better understanding of information. Moreover, the research, performed by Dunn and Brown (1993) several decades ago, revealed the influence of causal language on the recognition of a child's emotions. According to the authors, three-year old children (33 months old) that frequently used causal languages when talking to their mothers (about feelings, wishes, emotional states, and social activities) were better at recognising emotions. Thus, it is obvious that children's understanding of causality and ability to explain are significant aspects of cognitive development.

Understanding and explanation of causality provided by children of different age. As it has already been mentioned, children are able to distinguish causal relations by playing (Schulz, Bonawitz, 2007; Legare, 2012); however, researchers do not have a unanimous answer regarding the age when causal understanding and the ability to explain causality are formed. One of the approaches is that the older the child the better he/she is able to employ causality (Piaget, 1929; Das Gupta, Bryant, 1989; Frye et al., 1996; Sobel, Buchanan, 2009, Göksuna at al., 2010). According to Das Gupta and Bryant (1989), an ability to draw particular causal conclusions develops at the age of 3–4, since 3-year old children accomplished the tasks in a poorer way that 4-year old children. Frye et al. (1996) hold the same opinion and claim that causal explanations undergo some changes at the pre-school period. Sobel and Buchanan (2009) point out that 5-year old children tend to draw conclusions about the inner qualities of an object using causal explanations more often that 4-year old children. Meanwhile, Göksuna et al. (2010) confirms that 4-year old children provide more explanations in comparison to younger children when asked to describe a drawing.

Other researchers claim that young children employ causal choices when solving different tasks (Schlottmann et al., 2002; Kushnir, Gopnik, 2007; Sobel, Munro, 2009; Wellman, 2011; Bright, Feeney, 2014; Legare, Lombrozo, 2014). Sobel and Munro (2009) claim that children begin understanding specific aspects of particular areas at the age of three. Moreover, Kushnir and Gopnik (2007) state that small children can draw complicated causal conclusions. In their research, 3–4-year old children employed new evidence when drawing precise causal conclusions, even if they contracted children's beliefs. Legare and Lombrozo (2014) maintain that younger

children can accomplish a task more easily when both cause and consequence exist; whereas older children are able to associate apparently unrelated things. According to the researchers, 3–4-year old children are not able to provide precise causal explanations, while 5-year old children are able to perform such a task. Other researchers, such as Bright, Feeney (2014) state that when solving a task 8-year old children make causal decisions more often than 12-year old children or adults. It means that children to do not demonstrate inductive selectivity up to the age of 12, and they can employ causal knowledge when drawing conclusions before this age. Wellman (2011) also claims that the application of causality can be easier for younger children, since decision-making demands a clearly understandable answer. Finally, according to Schlottmann et al. (2002), pre-school children can distinguish events that are determined by causal relations from the ones that are not influenced by causality. The authors maintain that older children's understanding of causality reflects their verbal skills rather than changes in understanding itself, since young children can also understand causality provided verbal requirements are reduced. Besides, Schlottmann et al. (2002) note that 3-year old children, when given an oral explanation by an adult, can understand causal structures and interrelate the necessary stimuli by separating physical and social causality.

Children's ability to generalise causal relations. Generalisation is a mental operation when the general features or properties of a reality phenomenon are reflected by combining or grouping them on the basis of a certain feature. According to Piaget (cited in Kesselring, Müller, 2011), 3–8-year old children are characterised by egocentric thinking and syncretism, i.e. inability to generalise individual parts of a phenomenon. Klausmeier and Allen (1978) also explore generalisation. According to them, an ability to generalise through examples consistently develops depending on age (class). Crowley and Siegler (1999) confirm the statement by claiming that if children of different age are provided with the same instruction to accomplish a task, older children tend to provide wider generalisations (e.g. their research proves that 8-year old children are able to provide better generalisations than 7 or 6-year old children). According to the authors, it is assumed that older children provide better and more precise generalisations than younger children. However, the research conducted by Lucas et al. (2010) reveals that children made unusual generalisations on causative relations more often than adults, which proves that they have less partiality and prior presumptions, and are more focused on evidence that exists in the task. Moreover, the aforesaid research also determines that 4–5-year old children are able to recognise the forms of causality and apply them in making decisions in relation to new objects. Nevertheless, Booth (2014) states that children primarily learn to causally relate the features of things according to their purpose rather than causal properties of the things; hence, they tend to generalise properties that are based on perceived similarity.

2. Materials and Methods

The aim of the research is to explore the abilities of 4–7-year old children to explain and generalise causal relations independently. The objectives are as follows: (1) to analyse the abilities of 4–7-year old children to explain and generalise causal relations independently; (2) to compare the abilities of children aged 4–5, 5–6 and 6–7 to explain and general causality. The hypotheses are: (1) 6–7-year old children are better at giving independent and more precise explanations of causality than 5–6 and 4–5-year old children, whereas children aged 5–6 give better and more precise explanations of causality than 4–5-year old children; (2) 6–7-year old children are better at making generalisations than children aged 5–6 and 4–5, whereas children aged 5–6 are better at making generalisations than 4–5-year old children.

Seeking to explore children's abilities to give explanations of causality and make generalisations independently, an experiment was conducted. Its procedure was as follows: a test of colour recognition and naming → introducing a child with the research materials → a research on the abilities to explain causality → a research on the abilities to generalise causality. The research was conducted with every child individually in a separate room of the educational institution; children were given the same instructions and explanations. All the stages of the research will be presented consecutively.

The first stage of the research included the test of colour recognition and naming. Using a table of colours, a child was asked to recognise and name six colours. If the child was not able to define colours, he/she did not participate in further research. If a child was able to recognise and name colours, he/she was asked to explain causality and make independent generalisations.

Seeking to analyse the children's abilities to explain and generalise causality, stimulant materials were prepared. They consisted of eight figures: yellow hens with different spots on their wings (two figures with pink spots, two hens with purple spots, two figures with blue spots and two hens without spots on their wings). Different spots were provided as minor coloured stimuli that a child could relate to the egg. The child was expected to think and associate the spots with eggs; yet, the necessary thing would be discovered, since the wings of two hens were marked by the spots of the same colour, and only one of them contained an egg. Besides, it was noted that eggs were placed under four hens, and only two hens had the same wings. Hereby attempts were made to reveal the structure of the children's thinking, i.e. we wanted to know if the children would try to associate the colour of the wing spots, if they would discover some relation and try to explain the impossibility of causality. All the figures were of the same size (50 mm high and 60 mm wide). The legs of four hens were visible, and of the other four were hidden. White plastic eggs (30 mm) were placed under the hens that had hidden legs. Hence, an egg was placed under one of the hens that had the same colour spots on the wings or having no spots, and that had their legs hidden. The hens were placed on smooth green board (400x600 mm). Two of them sat in nests (130 mm in diameter): one of them with hidden legs and one with visible legs (the stimulant materials are presented in Fig. 1).
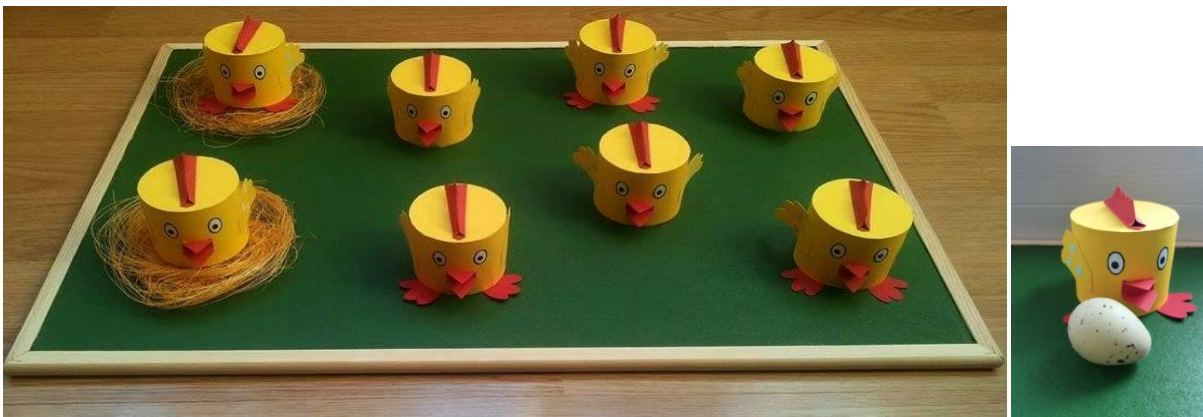
Fig. 1 Stimulant materials that was used in the research on a child's ability
to explain and generalise causality independently

Introducing the children with the research materials. The researcher demonstrated the stimulant materials to the children and allowed looking at them from all sides: "This is a game – hens' farm. You can have a look at it but you cannot touch it." When a child explored the farm, the researcher explained the rules: "Some hens have laid eggs, but not all of them. The rules are the following: you have to understand and show which of the hens have laid eggs. You can take these two hens that sit in the nests (showed the child the hens in the nests). Look which of them has an egg (the child raised the hen and looked). Now you have to find the other hens that have laid eggs. There are three more such hens. You can try four times, but before searching, look closely at the hen that has laid the egg" (a child was allowed to examine the hen for 30 seconds).

The piloting experiment of the abilities to explain causality. The researcher told a child: "Now you can start! Take one hen and show it to me. Let's look if it has laid an egg." (this attempt is not assessed). It is noteworthy that the children were encouraged to talk throughout the whole experiment by being asked various questions, such as "Why have you chosen this particular figure?", "Where did you know from/how did you guess that you'd find an egg here?", etc. The informants' replies were recorded on a dictaphone throughout the whole research.

Stage I of the research on the abilities to explain causality (assessed). The researcher told: "You have three attempts. Choose one hen which has laid an egg. Think and tell me why you have chosen this hen and we will look together if it has laid an egg." The researcher assessed the child's replies according to Table 1 – from 2 points (if the child was unable to explain causality) to 5 points (if the child could explain the connection between the visible legs of hens and the laid egg).

Stage II of the research on the abilities to explain causality (assessed). The researcher told: "You have two more tries. Choose a hen. Think and tell me why have you chosen this hen. Let's look under it if there is an egg." The child's replies were assessed from 1 to 4 points (see Table 1).

Stage III of the research on the abilities to explain causality (assessed). When choosing the last hen, a child was asked: "What do you think of the hens that have laid eggs – are they similar to or different from those that have not laid eggs? Think and tell me why have you chosen this particular egg." Bearing in mind that this was the last stage of the research, 0 points were assigned to a child if he/she could not understand and explain the causal relations between hens' legs and the laid egg. If the child could determine the causal relation, 3 points were assigned (see Table 1).

Table 1. Assessment of the children's independent replies concerning explaining causality

Children's explanations	Points assigned to children at different stages of the research		
	I	II	III
Unable to explain own choice The explanation does not comply with the reality or is unrelated to the task	2	1	0
Non-causal explanation (comparison to an unrelated object, identification of the position on the board or employing the strategy of guessing, personal motifs, employment of proximity)	3	2	1
Explanation of causality unrelated to legs, i.e. a child explains but does not generalise (this assessment was applied if a child explained the secondary stimulus, i.e. spoke about the spots on the wings of hens).	4	3	2
Causal explanation related to the legs of hens and the placed egg	5	4	3

When assessing the child's abilities of providing causal explanations, the total sum of the collected points can range from 3 (minimum) to 12 (maximum).

The stage of the research on the abilities of generalising causality. A child was told that all the stages of the experiment were finished and he/she was offered to lift the remaining hens. If needed, the child was allowed to think and asked to generalise: "What have you understood?" it is noteworthy that the current research aimed at complex generalisation, i.e. when objects were associated not according to one feature but according to several or more features. The child's abilities to generalise were assessed according to Table 2.

Table 2. Assessment of the children's independent generalisations

Children's abilities to generalise	Points assigned to children
Unable to generalise Generalisations unrelated to the task	0
Non-causal generalisation	1
Causal generalisation (this assessment was applied if a child was able to generalise using the secondary stimulus, i.e. the spots on the wings).	2
Causal generalisations relating the hidden legs of a hen and the existence of an egg under the hen	3

The participants of research. 66 children participated in the research. A convenience sampling was employed. Agreements from parents / caregivers were obtained. 6 children were not involved into the research (having obtained the parents' agreement, 4 children refused to participate in the experiment), one child did not want to continue, and 1 child did not recognise colours).

Table 3. Characteristics of research participants

Age groups of children	Age limits	Age average	Number of boys	Number of girls	General number of children in the research
4–5-year old	From 4 years 0 months to 5 years 0 months	4 years 8 months	9	13	22
5–6-year old	From 5 years 1 month to 6 years 0 months	5 years 6 months	11	11	22
6–7-year old	From 6 years 1 month to 7 years 0 months	6 years 5 months	13	9	22

3. Findings
When evaluating the abilities of pre-school children to make independent explanations and generalisations of causality, it is assumed that the analysis of both types of the research data (qualitative and quantitative), as it helps to envisage the thinking process of pre-school children.

Table 4 presents the primary quantitative (the number of the children's provided answers) and qualitative (examples of the answers) expression of the research data collected during the process of the children's explanations how they chose one or another hen.

Table 4. Explanations provided by children of different age

A child's explanation	Explanations		
	Number and examples of explanations provided by 4-5-year old children	Number and examples of explanations provided by 5-6-year old children	Number and examples of explanations provided by 6-7-year old children
Unable to explain own choice	25 answers [does not speak] "I don't know", "so so", "because I knew it", "because I thought so", "I was hidden and I found it"	24 answers [does not speak], "I don't know", "I guessed", "because it is usually so", "I tried", "I only looked and that's it", "because I want so"	21 answers [does not speak], "I don't know", "I thought that it was in that", "I guess I think so", "I can guess, I had this in my mind", "I somehow knew that it was there – my brain is a computer"
The explanation does not comply with the reality or is not related to the task	8 answers "because I heard the sound", "it is simple, I can know everything because I think a lot", "I know it because my aunt has some hens"	5 answers "The eye are surprised, they are wide", "because I have holly blood, I know it", "I play such a game at home, my mum taught me this game when you have to look	5 answers "I don't know, because it was looking at me", it looks funny", "because there is an egg, I can read", "because there is an egg, I saw a mountain", "because I looked and thought so"

A child's explanation	Explanations		
	Number and examples of explanations provided by 4-5-year old children	Number and examples of explanations provided by 5-6-year old children	Number and examples of explanations provided by 6-7-year old children
		where something is", "when their mother leaves, the child breaks the egg"	
A non-causal explanation	3 answers "It looks like the sun or a flower", "I went through the colours", "I noticed this hen"	4 answers "without legs", "because I like this colour", "because it is this", "I go in turn"	12 answers "They are different! They have legs, and these ones don't!", "because they were standing at the front", "because it has blue (spots), and it is my favourite colour", "as it is more beautiful"
Explanation of causality unrelated to legs, i.e. a child explains but does not generalise	3 answers "I thought it was here, because it could be here, as I thought it was here", "it is because of spots – it is always because of spots", "because it is with the "spots"	2 answers "the sports here are the same as there", "there are blue spots [it is an egg]"	3 answers "Those with eggs have blue spots, and they are all yellow", "I thought there will be no, but I guessed by these hens [with spots]", "I only looked at the spots, but not all of them have spots"
Causal explanation relating the legs of the hens with the laid egg	4 answers "because I understood that legs are here and here, where there are legs, there are eggs", "as I saw that sometimes where there are legs, there are eggs"	4 answers "because of legs", "there is an egg here. I find it different – one is with the legs and it has an egg, the one which has no legs has no egg"	6 answers "all of them had legs and this one also had legs, so I took this one", "I know it because there are legs – I recognised by legs (…) these hens are more real, otherwise how will they walk?"

As it is seen the number of answers varies in different age groups of children with the exception of the explanations that do not comply with the reality, are unrelated to the task or do not explain causality (i.e. parallels are drawn with an unrelated object, the position of the hen on the board or application of the strategy of guessing, personal motifs, employing proximity).

Having analysed the research data from the qualitative perspective, it is obvious that the explanations provided by children of different age groups do not differ considerably. The children of the two younger groups (aged 4–5 and 5–6) that are not sure of the answer use simple and hardly descriptive statements "I don't know", "because it is usually so", and only the children from the senior group (aged 6–7) provide more elaborate answers, e.g. "I somehow knew that it was there – my brain is a computer". The answers in which children try to provide different explanations (both related and unrelated to the cause) are also similar in all the age groups, yet it is noteworthy that they are more numerous, e.g. "I can know everything because I think a lot" (the answer of a 4–5-year old child).

The data provided in Table 5 demonstrate that the children of all age groups are able to make independent generalisations.

Table 5. Generalisations provided by the children of different age groups

A child's ability to generalise	Generalisations		
	4–5-year old	5–6-year old	6–7-year old
Unable to generalise	6 answers [does not speak], "I don't know what to tell you", "Hens. A nest. A board".	6 answers [does not speak], "I don't know", "I learnt myself"	7 answers [does not speak], "I don't know", "I understood everything well", "I don't know how to say... I am here for the first time"
Generalisations unrelated to the task	4 answers "When hens have eggs, they had an egg – either this or this (...). When I take this egg, my dad takes an egg and we cook the egg, and I eat the egg", "We have such a game at home and we play with my mom and dad, we have such eggs and nests, and you have to guess. We play such a game"	3 answers "You have to be clever and guess. Know", "I created this game, and my mum said that we will have to make these till night, and I know (...) but my mom didn't tell me anything"	1 answer "They will soon hatch the eggs"
Non-causal generalisation	4 answers "You see, these differ – one has laid an egg, and this one – no, when you take, you understand", "From this game I understand that you have to find eggs"	6 answers "not all hens had eggs, but some them differ – some have no legs, others have legs with spots, the spots differ", "some hens had eggs, others – no"	8 answers "Some hens have eggs, four hens", "you had to guess which hens had eggs", "you have to find eggs"
Causal generalisations	2 answers "You have to look for eggs (...), I looked by the spots", "you have to guess where the spots are (...), I thought that the ones with spots had eggs"	2 answers "There are hens (...) that have eggs, those with spots, here are no spots, and these are purple", "we have found three eggs, they differ, the wings don't have... you know what? Here, the spots"	1 answer "There are spots here, and here there are no spots"
Generalisations of causality relating the hidden legs of the hens with the existence of an egg	6 answers "Where there are legs, there is an egg, where there are no legs, there is no egg", "You have to find which hen has eggs, this, this, this and this have eggs, because they have legs, and these don't – this is the	5 answers "Where there are legs, there are eggs", "They have purple spots, and blue; the one that have legs have them [eggs], others don't"	5 answers "It is easy – where there are two legs, there is an egg. It's easy", "I understood from the very beginning, you didn't tell me but I understood at once that these hens had eggs (...)

A child's ability to generalise	Generalisations		
	4−5-year old	5−6-year old	6−7-year old
	difference"		because they had legs"

The quantitative data demonstrate that nearly the same number of children of different age groups could not provide generalisations; the differences in other groups of generalisations are not significant, either. A consistent statistical analysis of these data is provided below.

Assessing the children's abilities to generalise from the qualitative perspective, it is noteworthy that only the children that could not generalise provided very short and simple answers, such as "I don't know", "Hens. A nest. A board". The children of all age groups that made attempts to provide or provided generalisations spoke in longer monologues ("You see, these differ – one has laid an egg, and this one – no, when you take, you understand", a child aged 4−5), their language was more elaborate with some extra thoughts. It is possible to state that the children had a kind of a conversation with the researcher (e.g. "We have found three eggs, they differ, the wings don't have... you know what? Here, the spots").

Tables 4 and 5 present quantitative research data. They were assessed by attributing a certain sum of points (according to the points ascribed in accordance with Tables 1 and 2); their statistical analysis was performed. The criteria of Kolmogorov-Smirnov and Shapiro-Wilk tests were employed to verify the hypothesis on the normal distribution of variables. Table 6 presents the results of the normality test. The results of both Kolmogorov-Smirnov and Shapiro-Wilk tests are used, as well as the Sig level of significance is considered. As it is seen, the independent explanation and choice of variables differs from the normal distribution, since Kolmogorov-Smirnov and Shapiro-Wilk criteria were p<α, when the significance level was α=0,05. Hence, the data did not have normal distribution.

Table 6. The results on the variables according to Kolmogorov-Smirnov and Shapiro-Wilk tests

Age	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Independent explanation and generalisation 4−5	,324	22	,000	,679	22	,000
5−6	,345	22	,000	,618	22	,000
6−7	,241	22	,002	,733	22	,000

Table 7 shows that the variable of all generalisations was p<α, when the selected significance level was α=0,05. Hence, these variables did not have normal distribution, either. This being the reason, Mann-Whitney-Wilcoxon test was employed for independent samples, and Wilcoxon rank-sum test was used for dependent samples.

Table 7. The results on the ability to generalise according to Kolmogorov-Smirnov test

Generalisation	Age	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Made independently	4−5	,299	22	,000	,768	22	,000
	5−6	,236	22	,003	,794	22	,000
	6−7	,274	22	,000	,789	22	,000

The results presented in Table 8 demonstrate that 4−5-year old children were able to provide independent and precise explanations of causality better than 5−6-year old children; yet this difference was not statistically significant (p=0,688; p>0,05). Moreover, 6−7-year old children

were able to provide better explanations of causality than 4–5-year old children (p=0,276) and 5–6 (p=0,099), yet the differences between these two age groups were not statistically significant, either (p>0,05). Hence, a statistically significant difference was not established between the aforesaid age groups concerning independent explanations of causality.

Table 8. Comparison of the ranks of the abilities to provide independent explanations of causality in all age groups of children

Children's independent explanation of causality							
Age	N	Mean of ranks	Total sum of ranks	Mann-Whitney U	Wilcoxon W	Z	Significance
4–5	22	23,18	510,00	227,000	480,000	-,402	p=0,688
5–6	22	21,82	480,00				
4–5	22	20,50	451,00	198,000	451,000	-1,090	p=0,276
6–7	22	24,50	539,00				
5–6	22	19,50	429,00	176,000	429,000	-1,650	p=0,099
6–7	22	25,50	561,00				

The results presented in Table 9 demonstrate that 5-6-year old children provided more precise generalisations than 4–5-year old children at all stages of the research, yet the difference was not statistically significant (p=0,822; p>0,05). It is also obvious that 6–7-year old children provided more precise generalisations than children aged 4-5 (p=0,336) and aged 4–5 (p=0,275), yet the difference was not statistically significant, either (p>0,05). Consequently, the abilities of children aged 4–5, 5–6, and 6–7 to generalise did not differ statistically significantly.

Table 9. Comparison of the ranks of the abilities to generalise in all age groups of children

Children's abilities to generalise							
Age	N	Mean of ranks	Total sum of ranks	Mann-Whitney U	Wilcoxon W	Z	Significance
4–5	22	22,07	485,50	232,500	485,500	-,225	p=0,822
5–6	22	22,93	504,50				
4–5	22	20,66	454,50	201,500	454,500	-,962	p=0,336
6–7	22	24,34	535,50				
5–6	22	20,41	449,00	196,000	449,000	-1,092	p=0,275
6–7	22	24,59	541,00				

4. Discussion

The opinion of numerous researchers (Legare, 2012; Schulz, Bonawitz, 2007) that children can distinguish and explain causality by playing has been confirmed. In the current research, it has been determined that children aged 4-7 can explain causal relations, yet no statistically significant difference has been determined between all the age groups. The research confirms the propositions of Kushnir and Gopnik (2007) that 4-year old children can draw causal conclusions and the findings of Schlottmann et al. (2002) that young children understand causality provided linguistic requirements are limited. It is noteworthy that no high standards were set for children concerning oral answers. Nevertheless, we agree with Legare and Lombrozo (2014), who claim that older children experience less difficulty in searching for oral explanations, yet the quality of explanations themselves shall not necessarily be different.

While observing how the children of all age groups provided independent explanations of causality in our research, it became obvious that older children had less difficulty in providing oral explanations. Considering the research results quantitatively, it appears that 6–7-year old children provided more answers than the children aged 4–5 and 5–6, i.e. they kept silent more rarely, the answer "I don't know" was less frequent, and their replies more often complied with the reality and the task. Following Legare and Lombrozo's (2014) findings, although children experience less difficulty in finding words for explanations of causality, this fact does not affect the precision of the explanation itself. Therefore, it seemed that older children were able to find words for causal explanations more easily, no statistically significant differences were determined between all the age groups.

In the current research, we compared how the children of different age groups generalised causality. It was determined that the generalisation abilities of children aged 4–5, 5–6, and 6–7 did not differ significantly. The data of the research performed by Klausmeier and Allen (1978), and Crowley and Siegler (1999) demonstrate that school children's ability to generalise improves depending on their age, yet this fact was not confirmed by our research. Two reasons can be distinguished: first, the research was conducted with pre-school children and not with school children; second, no statistically significant difference was determined when analysing causal explanations in the explored age groups (aged 4–5, 5–6, and 6–7), bearing in mind that generalisation can depend on the ability of explanation.

Limitations of the research and further research. During the research attempts were made to create equal conditions for all children: the experiment was conducted individually with every child in a separate room, as well as the same instructions and explanations were provided to all children. However, the children's explanations might have been affected by external factors, such as the institutional environment, time of the day, poor motivation for speaking, and others. Hence, carrying out further research, it is important to equalise formal aspects as well (e.g. the research environment). It is noteworthy that causality is understood differently by different researchers. Seeking to clear out how children understand causal relations, particular simulant mechanisms are employed (Frye et al., 1996; Kushnir, Gopnik, 2007; Schulz, Bonawitz, 2007; Schulz et al., 2007a; Sobel, Buchanan, 2009, Sobel, Sommerville, 2009; Waismeyer et al., 2015). For instance, in their experiment, Schulz and Bonawitz (2007) provided children with two boxes equipped with two levers that dropped (or not) dolls. Sobel and Buchanan (2009) used a box with a switch that activated (or not) a melody, whereas Kushnir and Gopnik (2007) employed light switch, etc. In the current research, electronic devices were replaced by spatial bird figures, whereas children should relate certain details of the figures with the object to be found. The children had to understand that the hidden or visible legs of hens were related to the placed egg under a hen rather than understand a particular mechanism, as in the aforesaid researches. Moreover, photographs and pictures were used as simulant materials in other researches. For instance, in the studies conducted by Ahn et al. (2000), Bright and Feeney (2014), Gottfrieda and Gelman (2005), children were shown certain cards of animals, plants and mechanisms. In the latter research, attempts were made to combine similar simulant materials employing spatial visual materials reflecting causality. It is assumed that the choice of simulant materials could have an effect on children's replies and their explanation of the task. It is important to note that children perceived the provided information as compliant with the reality. For example, in the research conducted by Schulz et al. (2007b), some fairy tales were read to children, and they had to define causality. It is obvious that some simulant materials were associated with life situations than others, whereas some mechanisms might not be familiar to children. It is assumed that the results of different aforesaid researches can differ and depend on children's age. In our research, we provided the children with simulant materials, which did not aim at imitating real life situations. However, the children's replies showed that they were not contradicting real life situations, either (e.g. "I know it because there are legs – I recognised by legs (…) these hens are more real, otherwise how will they walk?"). Hence, the diversity of the provided simulation materials and the results obtained on the basis of this research lead to the assumption that the children's explanations of causality can depend on simulant materials. Therefore, when conducting further research on children's understanding and explanation of causality, it is recommended to consider and develop a research using different simulation materials, such certain mechanisms, pictures and life situations. Such being the case, future studies would expand our knowledge on how children of different age groups understand different structures of causality.

5. Conclusions

During the research, it has been determined that pre-school children (aged 4–7) are able to distinguish and explain causality. Besides, the research results demonstrate that the children's abilities to explain and generalise causality do not depend on their age (4–5, 5–6, and 6–7). It is assumed that children of different age groups understand structures of causality in a similar way if simulant materials, such as spatial animal figures, are close and understandable to children.

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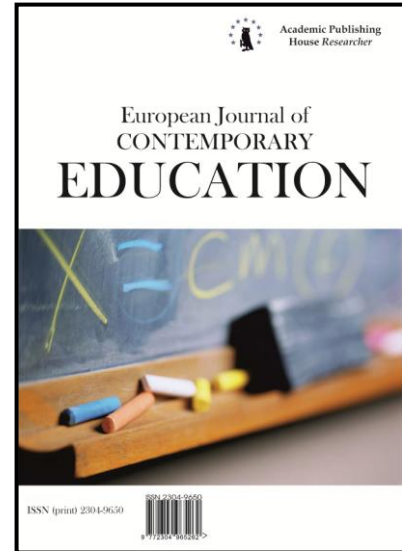
Students' Demographic, Academic Characteristics and Performance in Registered General Nursing Licensing Examination in Ghana

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Abstract

The decreasing performance of student nurses in the professional licensure examinations (LE) in Ghana is a major concern to stakeholders, especially at a time when the nurse-patient ratio stands at 1: 1500. The study sought to determine the effect of students' demographic and academic characteristics on performance in the Registered General Nursing (RGN) LE. A descriptive retrospective study was conducted using a researcher designed checklist to review the administrative and academic records of 324 nursing students who wrote the RGN LE between 2007 and 2012. A stratified sampling method was used to select the participants for the study. Chi-square statistics were used to determine the effect of the predictors: demographic characteristics, entry grade and Final Grade Point Average (FGPA) on the dependent variable (LE performance). The study revealed a relationship between gender and LE performance, residential status, entry grade and students' FGPA at the college. However, no significant relationship was found between the age of participants, subject background at high school and LE outcomes. We conclude that students' socio-demographic and academic characteristics such as gender, campus residential status, entry grade and FGPA influence the outcome of the final LE of RGN students. Consequently, priority should be given to applicants with high pre-entry aggregate during recruitment and on campus accommodation should be provided for all trainee nurses. Furthermore, weak students with low FGPA should be given special tuition before they are registered for the final LE to improve their outcomes.

Keywords: Academic Characteristics, Students' Demographic, Registered General, Ghana.

1. Introduction

A major challenge facing higher educational institutions around the world is how to achieve quality outcomes for students in an increasingly globalized and competitive environment (Harvey,

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Kamvounias, 2008). Nursing education has evolved over the years with the prime objective of providing high quality nursing education that produces well-educated and skilled nurses according to the needs and requirements of the dynamic growing Ghanaian society, as well as, meeting the demands of managing emerging diseases (Nurses and Midwives Council of Ghana, 2003). Mellish and colleagues indicate that nursing education is designed to educate and train nursing students to become competent and qualified professional nurses who have mastered certain skills and are knowledgeable about the science of nursing in order to provide skilled nursing care (Mellish, Brink, Paton, 2009). However, efforts at ensuring quality training of health personnel appears to be threatened by significant failure rates in Ghanaian nursing training institutions (Wilmot, Kumfo, Danso-Mensah, Antwi-Danso, 2013).

The RGN diploma programme is based on the semester and course unit system, and recruits graduates from the Senior High Schools. Applicants should obtain an aggregate of 30 or better in the West African Senior Secondary School Examination (WASSSE) or the Senior Secondary School Certificate Examination (SSSCE). Applicants could be either male or female between the ages of 18 and 35. The grades obtained by students in each semester during the period of training are converted into Grade Point Average (GPA) after which a Cumulative Grade Point Average (CGPA) is computed for each student at the end of the academic year. Upon completion of the six semester course, the students are registered to write the professional LE. A student should maintain a FGPA of 1.5 to qualify for registration to write the professional LE (Academic Unit, 2013).

A report by the Nursing and Midwifery Council of Ghana showed that out of the 2,178 candidates presented for the RGN LE in 2011, only 823 representing 37.7 % passed, whilst the bulk of the candidates (1,355) representing 62.2 % were referred (Bonney, 2011). Beaumont-Walters and Soyibo (1998) argued that many factors influence student performance, either directly or indirectly. Ali, Zubair, Munir, Khan and Ahmed (2013) reported that gender, age, teaching faculty, students schooling, guardians' social economic status, residential area of students, medium of instructions in schools, tuition trend, daily study hour and campus residency influenced students' academic performance.

Even though, a number of studies have reported age as the strongest demographic predictor of academic success in nursing courses (Kostecki, Bers, 2008; Timer, Clauson, 2010), Ali (2008) found that there was no association between age and academic performance among nursing diploma students. He indicated that candidates, regardless of their ages, may apply for admission and perform well in the general nursing diploma programme. Mulholland, Anionwu, Atkins, Tappern and Franks (2008) also reported that academic performance is mostly determined by the gender differences among students, with males being predominantly superior to females. However, a related study showed that female nursing students performed better academically than their male colleagues (Ali, 2008). Haas, Nugent and Rule (2004) explained that student factors like pre-entry qualifications is vital to academic performance. They emphasized that identifying and recruiting students who are most likely to succeed in the nursing programmes should be an important admission criterion for entering into the nursing profession.

Furthermore, academic performance is likely to be high if admission points are high and vice versa (Giddens, Gloeckner, 2005). Studies supporting this argument reported that the previous academic performance of students affect future academic performance (Bratti, Staffolani, 2002; Geiser, Santelices, 2007; McManus, Smithers, Partridge, Keeling, Fleming, 2003). Thus, this is an effective admission criterion which helps in selecting not only the suitable candidates, but also in identifying students who are at a risk of failure (Ali, 2008). Studies reporting on the influence of subject background on academic performance also found that, students with better grades in their pre-university examinations showed better performance in their examinations, regardless of the science subjects they took at the pre-university level (Jeffreys, 2007; Radhakrishnan, Nagarajah, Young, 2012; Newton, Smith, Moore, Magnan, 2007).

The relationship of science courses and successful completion of nursing school has also been cited in multiple literature (Moseley, Mead, 2008; Roncoli, Lisanti, Falcone, 2000; Woodfield, Earl-Novell, 2006). In addition, Students' GPA has been identified as a predictor of NCLEX-RN failure. A study showed that students who did not pass NCLEX-RN on the first attempt exhibited lower GPAs as compared to those who passed the NCLEX-RN (Beeson, Kissling, 2001). Previous studies on predictors of nursing students' success frequently found that higher GPAs are positively correlated with academic success in nursing educational programmes (Jeffreys, 2007; McManus et

al., 2003; Radhakrishnan et al., 2012). Several studies have examined the influence of student socio-demographic characteristics on academic performance. However, these studies frequently ignore the possibility that different groups of students are differently affected by these variables. Besides, significant components of literature focused on mainly inter semester performance of students overlooking the influence of these variables on the final nursing professional LE.

This study is pertinent in identifying specific socio-demographic and academic factors associated with nurse trainee poor performance in the final LE. The RGN LE results of students in Ghana under study have been declining over the past six years. An analysis of the results of the students revealed that, the pass rate of the institution dropped significantly from 82.1 % in 2007 to 28.9 % in 2011. Moreover, majority (71.1 %) of students presented for 2012 professional LE failed (Beaumont-Walters, Soyibo, 1998). Although there have been three major consecutive decline in performances of nursing LE nationwide between 2009 and 2011 in Ghana, few studies have examined the contributing factors of such a high failure rates. Studies conducted did not determine the influence of students' socio-demographic background and academic factors on performance in the LE. Furthermore, no study has been conducted at the institution under study. There is therefore little scientific data that explains why nursing student performs poorly in the LE in Ghana. The main purpose of this study is to statistically validate the influences of specific socio-demographic characteristics of student nurses, as well as the influence of academic factors such as subject background, pre-entry aggregates and FGPA on licensure performance.

2. Methods
Design and Sampling
The retrospective, descriptive study design was used to frame the study. The study collected administrative data to assess the influence of students' socio-demographic characteristics as well as students' GPA/FGPA on LE outcomes. The academic records of 324 students admitted between 2007 and 2012 who wrote the RGN LE conducted between 2007 and 2012 were reviewed using data extraction sheets. A stratified sampling method was used to select 324 student records from the institution's Academic Unit. A proportional allocation was used to select records from each year group. Data on students' GPA, socio-demographic characteristics and students' performance pertinent to this study was also obtained from the Academic Unit. The relationship between students' performance in LE and selected factors were examined using frequencies, correlations, and chi-squares.

Ethical Consideration
The study complied with all the prescriptions for doing research with human samples and related human data. In addition, institutional permission was obtained while the identity of the students and their records were anonymised, protected and kept confidential.

Data processing and Analysis
Statistical Package for the Social Sciences and Microsoft Excel tools were used to process and analyse data that were collected from students' files and records. Bivariate descriptive statistics of cross tabulation and chi-square test at 95 % confidence interval, $p < 0.05$ which was considered statistically significant were used to identify the relationship between the dependent variable (academic performance) and the predictor variables (demographic characteristics, student subject background, student WASSCE/SSSCE performance and semester performance). This statistical technique was used because it helped in exploring the linear and multiple relationships between the predictor variables.

3. Results
The result in Table 1 showed that, 3 out of 5 students were aged 20 years or below (62 %). Female subjects represented 65 %. Other socio-demographic characteristics of respondents included 64.8 % residential students compared to 35 % non-residential students.

Table 1. Background characteristics of subjects

Parameters	Frequency	Percentage (%)	Mean±S.E
Age categories			1.359±0.0308
20 years & below	205	63.3	
21-25 years	112	34.6	
26-30 years	5	1.5	
31-35 years	2	0.6	
Gender			1.648±0.0266
Male	114	35.2	
Female	210	64.8	
Occupation of guardian			1.534±0.0278
Government worker	151	46.6	
Self employed	173	53.4	
Residential status			1.352±0.0270
Resident	210	64.8	
Non-resident	114	35.2	
Total	324		

The study revealed that 3 out of 5 students (63.3 %) aged 20 or below obtained 64.9 % pass rate in the LE, whilst 35.1 % were referred. More than half (58 %) of students aged between 21 and 25 years passed the LE at their first attempt. The results showed that there was no significant association between age categories and performance in the LE at 0.05 confidence level ($\chi 2$= 4.744, p= 0.19). The table also showed that female students formed the majority (64.8 %) of nursing students. Among those who failed, almost 5 out of 10 (47.4 %) male students failed the LE at their first attempt, compared to 3 out of 10 (32.9 %) female students. The chi-square statistics showed that more females students passed the licensure exams at the first attempt compared to males ($\chi 2$= 6.601, p= 0.010).

In addition, 3 out of 10 (31.9 %) resident students failed the LE at first sitting while almost half (49.1 %) non-resident students failed at first sitting. Chi-square statistics showed that campus residence facilitates good performance in LE. The result was significant at 5 % ($\chi 2$= 9.301, p= 0.002).

Table 2. Demographic characteristics and LE outcome

Parameter	Pass (%)	Fail (%)	Total (%)	χ2	P- value
Age					
20 years and below	133(64.9)	72(35.1)	205(63.3)		
21-25 years	65(58)	47(42)	112(34.6)		
26-30 years	3(60)	2(40)	5(1.5)	4.744	0.19
31-35 years	0(0)	2(100)	2(0.6)		
Total	201(62)	123(38)	324(100)		

Gender					
Male	60(52.6)	54(47.4)	114(35.2)		
Female	141(67.1)	69(32.9)	210(64.8)	6.601	0.010
Total	201(62)	123(38)	324(100)		
Occupation of guardian					
Government workers	96(63.6)	55(36.4)	151(46.6)		
Self employed	105(60.7)	68(39.3)	173(53.4)	0.284	0.594
Total	201(62)	123(38)	324(100)		
Residential status					
Residence	143(68.1)	67(31.9)	210(64.8)		
Non residence	58(50.9)	56(49.1)	114(35.2)	9.301	0.002
Total	201(62)	123(38)	324(100)		

The study further showed that guardian occupation does not have any influence on LE performance ($\chi2$= 0.284, p= 0.594). Only 36 % of students whose guardians were government workers failed whilst 39 % of students with guardians who were self-employed failed the LE.

Table 3. Effects of subject background on LE outcome

Subject background	Pass (%)	Fail (%)	Total (%)	χ2	P-value
General science	105(68.2)	49(31.8)	154(47.5)		
General agriculture	5(50)	5(50)	10(3.1)		
General arts	88(56.4)	68(43.6)	156(48.1)	5.467	0.141
Home economics	3(75)	1(25)	4(1.2)		
Total	201(62)	123(38)	324(100)		

The research further revealed that 7 in 10 (68 %) of the students who offered General Science at the Senior Secondary School passed the LE whilst 3 in 10 (31.8 %) failed. Less than half (47.5 %) of students with science background passed the examination at first attempt. Less than half (48.1 %) of the students with general arts background also passed. Chi-square statistics indicated that, there was no significant association between subject background and LE outcome (p= 0.141).

Table 4. Effects of entry aggregate on LE outcome

Entry aggregate	Pass (%)	Fail (%)	Total (%)	χ2	P-value
11-14	10(76.9)	3(23.1)	13(4.0)		
15-19	87(72.5)	33(27.5)	120(37)		
20-24	104(54.4)	87(45.5)	191(59)	11.469	0.003
Total	201(62)	123(38)	324(100)		

The research result in Table 4 also showed that more than 2 out of 10 (45.5 %) of students with entry aggregate between 20–24 failed LE at the first sitting. Majority (76.9 %) of students with entry aggregate of 11-14 passed the examination at the first sitting. Chi-square statistics showed that the higher students' grade point, the better their performance in the LE (p= 0.010).

Table 5. Effects of final GPA on LE outcome

Final grade point	Pass (%)	Fail (%)	Total (%)	χ2	P-value
3.6-4.0	19(95)	1(5)	20(6.2)		
3.0-3.5	81(77.1)	24(22.9)	105(32.4)		
2.5-2.9	84(58.7)	59(41.3)	143(44.1)		
2.0-2.4	16((32)	34(68)	50(15.4)	44.459	0.0001
1.5-1.9	1(16.7)	5(83.3)	6(1.9)		
Total	201(62)	123(38)	324(100)		

The result revealed that Licensure performance was significantly associated with FGPA (p= 0.0001). Majority (95 %) of students with FGPA between 3.6–4.0 passed the LE. Licensure failure rates also increased from 5 % to 83 % for students with FGPA ranging between 1.5–1.9 respectively as shown in Table 5.

Table 6. Effects of size of class on LE outcome

Year Group	Total no. of candidates Presented	Pass (%)	Fail (%)
2007	39	82.1	17.9
2008	95	56.8	43.2
2009	84	65.5	34.5
2010	54	57.4	42.6
2011	90	28.9	71.1
2012	71	87	13
Total	433	60	40

The research further demonstrated that most of the smaller year groups presented for the LE had better pass rates compared to the larger year groups. For instance, in 2007 where only 39 students were presented for the LE, only 17.9 % failed at first sitting. Meanwhile in 2011, 7 out 10 students (71.1 %) failed the LE when 90 students were presented for the LE.

4. Discussion
This study revealed that gender, campus residency, pre-nursing school aggregate, GPA and FGPA of student nurses were the major factors associated with performance in the nursing professional LE. The study showed that female nursing students perform better at 67.1 % in LE than their male counterparts at 52.6 %. These results are in agreement with other studies that found that female students had higher rates of course success than male students in nursing schools (Mulholland et al., 2008). Such performance could be attributed to the assiduous nature of female students as well as institutional, governmental and public encouragement on education female educations (Newton et al., 2007). There was significant relationship between sex and licensure performance. Female students passed the licensure exams at the first attempt compared to males.

The result showed a decrease in the LE pass the rate from 64.9 % for students aged 20 or below to 58 % for students aged 21-25. No students aged 31 between 35 passed the LE at first attempt. This finding could be explained by the fact that, younger students may have lesser stressors and free from certain responsibilities and such are able to concentrate on their academic work. However, there was no significant relationship between age and licensure performance. The findings are consistent with the report of Ali (2008) who reported that there was no association between age and academic performance among nursing diploma students and that

candidates regardless of their age may apply for admission and perform well in the general nursing diploma programme.

Only 31.9 % resident students failed the LE at first sitting whiles almost half (49.1 %) non-resident students failed at first sitting. Chi-square statistics showed that staying on campus was associated with good performance in licensure exams. The findings also showed that most of the students (64.8 %) were not resident on campus. Previous research suggested that living on campus promotes a variety of desirable academic outcomes by enhancing student's involvement and engagement with their institutions and academic work (Ali, 2008; Ali et al., 2013). The result of this study confirmed the strong association between nursing LE outcome and residential status of diploma nurses. Such association could be attributed to social interactions such as forming of discussion groups between peers and extracurricular activities which enhance students' critical thinking and reading abilities. Thus, students become actively involved in academic activities which make them take more responsibility for their studies rather than receiving passive information.

Additionally, the research result revealed that 45.5 % of students with entry aggregate between 20 and 24 failed LE at the first attempt. On the contrary, majority (76.9 %) with entry aggregate of 11-14 passed the examination at the first sitting. Chi-square statistics indicates that the higher grade point a student attains the better performance he or she achieves the LE. The study has found association between grades obtained in the WASSSE/SSSCE and performance in the LE. These findings are congruent with several research findings which have suggested that pre-entry qualification is an important criterion for success in nursing schools (Geiser, Santelices, 2007; Giddens, Gloeckner, 2005; Haas et al., 2004). This could be explained by the assertion that previous performance affects future performance and that if admission grade points are high, then the academic performance is likely to be high and vice versa. We conclude that, students' individual ability and motivation is influenced by previous academic success.

Studies in the past had reported that students who offered science courses in the second cycle institution performed better in the nursing programme compared to students who offered other courses secondary school (Jeffreys, 2007; Newton et al., 2007; Roncoli et al., 2000). Contrary to these previous research findings, the results of this study disclosed that there is no significant association between subject backgrounds on nursing licensure performance outcome. Student nurses could achieve better academic outcomes regardless of their subject area in the senior high school. This finding could be due to individual motivation, self-efficacy and student learning styles.

The results again revealed that the higher GPA a student obtains, the better his or her LE performance. Performance in the LE seems to increase with increase in final grade point. There was positive relationship between final grade point of students and LE outcome at 0.05 confidence level. The study revealed that, only 5 % of students with FGPA between 3.6 and 4.0 failed the LE whilst majority of students (83 %) with FGPA of 1.5 to 1.9 failed the examination at the first attempt. This result supported findings which reported that higher GPAs were positively correlated with academic success in nursing courses or programmes (McManus, Smithers, Partridge, Keeling, Fleming, 2003; Radhakrishnan, Nagarajah, Young, 2012) and that even slight changes in CGPA were significant to predict the successes between student who would pass or fail LE (Landry, Davis, Alameida, Prive, & Renwanz-Boyle, 2010; Pitt, Powis, Levett-Jones, Hunter, 2012; Tipton et al., 2008).

The result further demonstrated that; poor licensure performance is associated with larger class sizes. The association of large class size with failure in the LE could be due to inadequate text books, library space, overcrowding in classrooms and poor student - tutor ratio (Babcock, Bedard, Schulte, 2012; Graue, Hatch, Rao, Oen, 2007; Konstantopoulos, Sun, 2014; Sohn, 2016). These factors could be impacting negatively on the teaching-learning process.

5. Conclusions and Recommendations

The study revealed that, female nurse trainees' performed better in LE than their male counterparts. The results also confirmed strong association between LE outcome and campus residential status students. Students with higher pre-entry and final grade points tend to perform better than their counterparts with lower points in the LE. The final grade point of trainee nurses is also a strong predictor of success in the professional LE.

Based on the findings of this study, we conclude that certain student socio-demographic and academic characteristics whilst in training affect the nurse trainees' final LE outcome. In other to improve upon the licensing pass rate there is the need to review the entry behaviour of students to select applicants who are most likely to perform academically. The teaching and learning methodologies and school environment should be modified to improve student FGPA before they are registered for the professional LE.

We recommend that, policy makers and other stakeholders in nursing education should enforce specific policies and protocols to select applicants with high pre-entry aggregate during student recruitment for training.

6. Conflicts of Interest
The authors declare the work has no conflicts of interest.

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School and University in Soviet Cinema of "Perestroika" (1986–1991)

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Abstract

Films of the "perestroika" period (1986–1991) related to school/university theme showed that:

- the educational / upbringing process has lost the previous strict storylines and in many respects has lost its communist landmarks;

- both school and university have acute problem areas (crisis, disappointment and fatigue, professional "burning out" of teachers, stagnation, hypocrisy, lies, bureaucracy and authoritarianism, pragmatic cynicism of students, teenage cruelty, underage sexual activity, etc.);

- the activity of a schoolchild / student again became more directed toward the outside world than to the inner world;

- appropriate distance in the teacher-student relationship has become more fragile (familiarity, sexual relation, or its provocation); in the films *Work on Mistakes* (1988) and *Asthenic Syndrome* (1989), male teachers even fight with high school students in class or in the school corridor;

- the prestige of the pedagogical profession in the eyes of students and the public has fallen even lower; in accordance with the real state of affairs, female teachers' images (often lonely, unsettled) came to the forefront;

- the main conflicts of plots were built on the opposition of non-ordinary teachers and students with stagnation, bureaucracy, mediocre bosses / colleagues / peers.

In fact, one can probably assume that the exposing "black series" of the perestroika cinema (where the youth theme was one of the most prominent ones) served a kind of "mobilizing purpose", only at the time it was not the orientation of "Soviet power elites in the renewal of the

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tools which they embodied the communist project with". Conversely, a Western-oriented part of the Soviet ruling elite used "uncensored" cinematography as one of the levers for the gradual liquidation of socialism. On the other hand, it is possible not to attach special importance to this "conspiracy" assumption, believing that Soviet cinematographers spontaneously walked in the wake of political and socio-cultural changes of the "perestroika" era. After all, we should not forget that by the end of the 1980s a paradoxical situation arose in the USSR when the state continued to finance film production, but in the actual absence of censorship, filmmakers could produce all that they wanted, practically ignoring the opinion of the leading bodies of the CPSU and the government.

Keywords: audiovisual media text, film, the USSR, perestroika, school, university, student, pupil, teacher, cinema.

1. Introduction

In this article, we address the goals, objectives, and author's concepts of audiovisual media interpretations of the theme of school and university in the Soviet cinema during "perestroika" (1986–1991). As in our previous works (Fedorov et al., 2017), relying on the technologies developed by C. Bazalgette (Bazalgette, 1995), A. Silverblatt (Silverblatt, 2001: 80-81), W.J. Potter (Potter, 2001), U. Eco (Eco, 1998; 2005: 209), O.V. Aronson (Aronson, 2003; 2007), N.A. Khrenov (Khrenov, 2006; 2008), we perform a general hermeneutic analysis of Soviet feature films related to the theme of school and university of this period.

2. Materials and methods

The material of our research is Soviet feature films relating to the theme of school and university. The main method is a comparative hermeneutic analysis of Soviet films during perestroika (1986–1991), including: analysis of stereotypes, ideological analysis, identification analysis, iconographic analysis, plot analysis, character analysis, etc.). Books and articles touching upon school and university subjects in cinema have been also examined (Anninsky, 2006; Arcus, 2010; Belyaeva, Mikhaylin, 2015; Gerber, 1989; Romanenko, 1989; Shipulina, 2010; Stishova, 1992; Sumenov, 1989; Zorkaya, 1989, etc.).

3. Discussion

Keen researchers of films on school and schoolchildren G.A. Belyaeva and V.Y. Mikhailin argue that "the emergence of the school genre was due to the need of the Soviet power elites in updating the tools which they embodied the communist project with and carried out the necessary work to create profitable and acceptable to the viewers matrices, with which the latter could build their own projective realities. In this sense, the customer or the agency, forming the system of expectations necessary for the emergence of the genre is two social groups: the actual Soviet power elite (and the closely related cultural elites) form the "commission" directly, solving very specific mobilization tasks. However they are guided by a very definite set of projective realities, compatible with the positively and negatively colored personal expectations of a "common Soviet man", who, in this way, is also directly involved in shaping this commission" (Belyayeva, Mikhailin, 2015: 551). Aside from the fact that the authors clearly confuse the terms "genre" and "theme" (a film genre isn't its theme, but there may be overlap; so any topic, including school, can be features in different genres), it is quite possible to agree with the rest. However, it was true before the "perestroika" period, when a lot of films about the school and university broke the former Soviet "mobilization agenda": the communism project was rejected, the former idealized screen world of school and university collapsed.

First Western cinema, and a little later – Polish and Hungarian cinema in the 1970s, broke the previous censorship bans and disclosed striking themes of minors' violence, drug addiction, child prostitution, sexual relations not only between students, but also between school teachers and students. Thus the generation gap eternal problem was tinted with new and shocking colors.

With an understandable delay, Soviet cinematography joined this tendency only in the perestroika period, although in the first half of the 1980s it seemed that the *Boys* (1983) and *Scarecrow* (1983) marked the top bar of the censorship permissible representation of youth in the Soviet cinema.

So, in the drama *Arsonists* (1988) a special school for girls aged 15–16 was graphically shown. The action of the first half of the film is transferred from the toilet to the punishment cell, from the shabby barn to the dark closet. Violence, drugs, cruelty, in a spiritually sanctimonious state shell accompanied with the song "My address is not a house or a street...". When a youthy teacher, well aware of the mores of the school's population, prefers not to notice the fresh blood on the mirror in the bedroom for twenty people. When the strong take pleasure in bullying the weak. The first part of the film features some strong episodes. And the main character - the leader of the vocational school's class- is presented by the authors unusually harshly, giving no hints for sympathy, without traditional scenes of reformation and hope.

In our opinion, the second part of the film looks weaker, when a girl, having escaped from the "educational institution", makes her way to Central Asia. A lot of episodes seem superfluous and protracted, and, probably, the picture would only have benefited if the authors had deepened their investigation into the characters and relationship in the special school.

Even more shocking, especially compared to Soviet films about children of the 1950s and 1970s, was the *Government Facility* (1989). The film had a terrifying ending: a 15-year-old orphan killed a man as a revenge for his girlfriend, raped by him. But it was also a vengeance for his ruined childhood, for his friend's drug overdose, for the hypocritical slogans of adults, for the social indifference, for the wretchedness of his life. Only five years earlier Soviet people enjoyed watching a sentimental *Orphanage's Headmistress* (1983), where the caring and affectionate heroine performed by N. Gundareva sincerely tried to create a home comfort for her disadvantaged foster pupils.

But in 1989 the very name of the film *Government Facility* sounded like a severe and ruthless accusation. There's nothing to do about it: by the beginning of the 1990s, almost the entire country turned into an unfriendly and uncomfortable state house, whose inhabitants were doomed to humiliation of human dignity, discomforts and stresses, poverty and lack of freedom; the orphanage, as a water drop, reflected all the vices and misfortunes of Soviet life.

"The headmistress" of the government facility was played by G. Polskhih. Previously she had played a lot of charming, good mothers. But here her character, the head teacher of the orphanage, is far from educational problems. G. Polskhih played an administrative appendage of the government mechanism of foster children's management.

At the same time, she is not at all a monster, at times, she can talk to someone heart to heart. She has quite good relationship with her colleagues. She is not too strict. She may scream with the power of the fire alarm, but she settles the nerves quite quickly, too.

By the way, this feature was pointed out by the authors very accurately. The system of interrelations in an average educational institution made school and orphanage's employees develop an ability to bring oneself almost to hysterics (outwardly) with absolute coldness and indifference (internally). G. Polskhih's character values the facade of well-being in the first place. For its sake, she is ready to turn a blind eye to anything. The film gave a kind of sociological snapshot of the life of the "captives" of orphanages, calling for mercy, compassion, changing the community for the kinder way.

In the film *Made in the USSR* (1990), the usual secondary school became a model of a totalitarian state. A trivial story about a mysterious theft of a VCR (curiously enough, a VCR and a video camera used to be some of the most common objects of theft in "perestroika" films about the school, but today's young audience probably needs a special explanation on the prestigious value of video or branded jeans during perestroika) turns into a grotesque and gloomy farce, when the acting director terrorizes students and teachers as a dictator. Young "patriots" punish their peers "dissidents", joining the ranks of the "pioneer-yugend", and a school laboratory turns into a torture room. The sinister and bitter satire of this film was undoubtedly inspired by the anti-utopias of G. Orwell and E. Zamyatin, but, oddly enough, it does not seem outdated even today.

However, perhaps the most pessimistic view of school problems was in K. Muratova's *Asthenic Syndrome* (1989): in mainstream cinematography "the director would know exactly who is good, who is bad, who is right, who is wrong. If the teacher is not talented, then it's OK for the students not to listen to him; or vice versa: they are loafers and hooligans, if they do not listen to their teacher ... Muratova has a different way; people generally do not care at all who is right, who is wrong, what is going on here or elsewhere: is there anyone here" (Anninsky, 2006: 78-79). Here the students are busy with anything (eating, looking at obscene pictures, chattering, etc.), but not

the subject matter. Here, a teacher, tormented by such a pedagogical process, can easily fight a high school student right during the lesson, and in the end of the film simply fall asleep forever.

It was during the perestroika years that the previously poorly accentuated topic of material inequality was sharply outlined in the films about school.

For example, analyzing the drama *Temptation* (1987), V.S. Ivanova persuaded the readers that it "inherited the best traditions of our school film: careful attitude to the youngest, the conversation is not at different levels, but on an equal footing, because even the smallest creature running around you is a person. In all the high sense of the word. That is, he, she may be already bad, and already good, but they entered life, society, they have a sum of claims, but also a sum of promises. ... Yes, others say, it is necessary to give the injection of adult life to children as early as possible – I do not know if it is so. but let's all the same do this gradually. With anesthesia. And in any case, with love. Otherwise it's a shock. Otherwise, scrap. As in *Temptation* (Ivanova, 1990: 52).

At the beginning of the film *Temptation* it seems that the tenth grade student Zhenya is an elder sister of Lena (Scarecrow, 1983). Firstly, as Lena, she's new in class, and secondly, she falls in love with the cleverest and the most handsome and popular guy. But most importantly – she is a strong personality. But while Lena finds the strength to oppose the crowd one versus all, Zhenya is craving to win a place under the sun of the school elite. Zhenya's and Lena's classmates, if different from each other, it is only by age. The circle of interests they have, in fact, is the same. But the film's directing is deprived of lyricism and semitones.

At pre-perestroika times, the authors would simply have to expose the character possessed by the "thirst for a beautiful life". However, *Temptation* is different. The problem is not about Zhenya dreaming of being accepted to "upper society" at her new school. The drama of the heroine is that she fell victim to the double morality of the society, an imaginary equality of opportunities. When the camera is mercilessly showing the fierce fight of Zhenya with her classmates after they exposed her fictitious elitism, the authors' position is clearly emphasized.

If *Temptation* had been produced in the beginning of the 1980s (actually, the script by Yuri Klepikov was written for Dinara Asanova), it would undoubtedly have produced a shock effect, even more than *Scarecrow*. But at the box office in 1988, along with other "exposing" picture, Zhenya's story was received without any special public resonance.

In 1991, the theme of schoolchildren from "high society" was continued by the film *Darling Ap* (screen version of the story by G. Mikhasenko). E. Stishova wrote that this film priori asked for critical reproaches in the varnishing of reality. Severe critics had a lot of remarks. Children's Versailles, arranged by the director in the pavilions of the Belarusian film studio, was a nice change to people, exhausted by perestroika. Teenagers dressed in tuxedos with bow ties at a classmates' birthday party, girls dressed up in haut couture gowns, the americanization of interiors and conversations, the rejection of everyday truth in the name of Beauty was, of course, an attempt for poetics, polemical in relation to the symbol of faith of the modern screen, pretending to reflect "life in the forms of life itself". To the critic's taste, there was not enough author's presence in the film, irony could be barely read, which is why the system of conventions, consciously chosen by the director, can be perceived as the relict thinking of the times of socialist realism, and not at all like a fairy tale movie, deliberately dropped out of social coordinates, deliberately abandoned psychology and connotation. *Darling Ap* manifests a certain intention of the film process, ready to form in the direction. It's the break with ideology, in the place of which any mythology will do - from Hollywood to the ancient one (Stishova, 1992: 135).

We must pay tribute to the perspicacity of E. Stishova: the proportion of films that got rid of connotations and psychological underpinning became noticeably larger in Russian cinema both in the 1990s and in the 2000s, affecting the school theme, too.

Perestroika cinema about schoolchildren has also broke old sexual prohibitions. Virtually, university teacher-university student affairs (albeit puritanically shown) were possible in Soviet cinema (*Grasshopper*, 1979), but the sexual relationship between school teachers and high school students was taboo (although there might be a hint of it, for example, in the melodrama *The Story of the First Love,* 1957).

It started small: in the drama *Come What May* (1986), the zealous head teacher accused an innocent school dance production in the propaganda of "lecherous break dance," and an extraordinary high school student called his young teacher a beauty and declared his love in front of the whole class.

However in *Work on Mistakes* (1988), one of the key scenes of the film was a seduction attempted by a school girl of her teacher (the teacher, though, resisted); schoolchildren mocked a classmate, who's still a virgin being 16. Scenes of seduction (although unsuccessful) of teachers are also present in the films *Joys of the Youth* (1987) and *Slap in the Face that Never Happened* (1987).

The drama *The Doll* (1988) boldly violated the last censorship bastion, featuring (no details) the sexual relationship between a female schoolteacher and a male high school student. Against the backdrop of the flow of perestroika revelations and turbulent political events of the late 1980s, *The Doll* did not cause a sensation. Someone grumbled, but press reacted calmly – as to the usual fact of life, transferred to the screen (Gerber, 1989). To a greater extent, the film proved to be interesting because of the different highlight: exhausting sports work from early childhood leaves not a second of childhood, turning a living girl into an elastic doll. The fairy tale ends, the doll gets ill and is no longer of interest to the state sport committee. She used to be a princess, but becomes a Cinderella, she has to start all over again in a new class. And she does so according to the principles developed by professional sport: twice two makes only four (Gerber, 1989: 7).

In the perestroika period, the storyline of an extraordinary university / school student was developed again (*Come What May*, 1986; *Work on Mistakes*, 1988; *The Whistler*, 1988; *The Jester*, 1988; *Puppy*, 1988; *Darling Ap*, 1991, etc.). One can probably agree with the opinion of A. Romanenko, voiced by her in 1989: no matter how bitter it is, but still we must admit that the inner life of a young man remained for decades closed not because our grown-up children are so complicated and closed for us, but because the art was afraid to look at their features, to describe their morals, to listen to a sincere confession. Because it would require new ways of analysis, and civic courage, and awareness of the fact that the film may not be allowed on the screens. Too strong were obstacles for such films and books, the whole period of a person's maturing was missed. Now the art has begun to make up for lost time, but it does it sometimes feverishly and hurriedly, going only the upper layer of life deep. Because life that has gone ahead requires new forms of communication, and new tools for analysis, philosophical equipment, sociological thinking, and the publicist's gift. ... A decade ago, three points of view on the current generation of young people were widely popular. The first argued that our youth is wonderful, heroic, almost burning with enthusiasm. The second focused on negative phenomena in the youth environment. They even exaggerated their scale. Still others ironically lamented: two thousand years ago people used to complain about the youth's moral degeneration, nothing new about that. Meanwhile, no one was able to penetrate into the real essence of the issues bothering young people, to feel the guilt and responsibility of the older generation, to understand the role of that social atmosphere that reigned in the seventies and influenced the spiritual warehouse and the attitude of the young. Today, the problem of youth has become the key one in life and in art. ... It is not surprising that keen interest, which was caused by the films offering a new level of truth in the conversation about youth (Romanenko, 1989: 43, 46).

Despite the acuteness of many "perestroika" films, the most debated film, where the main character was an offbeat schoolboy, was *Plumbum, or a Dangerous Game* (1986). Ruslan Chutko, nicknamed "Plumbum" is a young assistant of the police, using for the sake of "high" goals any means - betrayal, blackmail, lies, violence. But the authors of this dramatic parable do not make him a disgusting monster. Yes, Ruslan meticulously and pedantically interrogates his father-poacher, reveling in his incorruptible authority. But the audience can see some human, even children's feature. But the line of Ruslan's parents is schematic: his mother is only interested in sentimental songs, fashion and figure skating on TV, and his father - in fishing in the wrong place. These are not alive characters, but signs, symbols of superficial slip in life. Other characters are somewhat hyperbolized too. Earlier works of A. Mindadze and V. Abdrashitov did not contain such obsessive symbolism and frank didacticism. However in *Plumbum* almost every episode is translated unambiguously.

Apparently, given the relatively small box-office success of their previous works (*The Word in Defense*, *The Turn*, *The Fox Hunt*, *The Train Stopped*, *Planet Parade*), the authors decided to get own back by making a spectacular picture, aimed at disputes. In order for the film to become more understandable and easier to read, they intentionally chose to simplify the characters, to repeat the symbolism, to add suspense. Perhaps, it made sense in terms of building a bridge between popular culture and more complex works of art. *Plumbum* just became such an link.

However, in the second half of the 1980s, the main character, Plumbum caused drastic disagreement among the audience. Some considered him a hero, others – a scoundrel. Some saw him as a role model, others angrily exposed his ignoble actions.

Film critics' opinions differentiated, too. For example, A. Romanenko wrote: "Today the screen exposes the stereotypes of our thinking, explodes the usual patterns and approaches to analysis. According to generally accepted indicators, the hero of the film by V. Abdrashitov *Plumbum* – a teenager Ruska – can quite claim the role of a hero. An excellent student, a public figure, an obedient son. But if one correlates Ruska's world with universal moral values: mercy, love – all his qualities begin to grow smaller and are seen as if in a different light. The knowledge he has mastered is just information that cannot become the basis of human culture, the relationship with parents is a ritual, the struggle against the criminal world is a way to test one's self, a self-assertion. Everything is turned inside out, the polarity is being reversed (Romanenko, 1989: 44).

A. Gerber believed that Vadim Abdrashitov and Alexander Mindadze's film does not reassure or cheer. Some people might even humble with its impartial truth. She anticipated the irritation of the viewer, who is used to treating art as a well-groomed cemetery in the summer months, where everything is quiet and simple – "neither friends, nor enemies can be seen", as she puts it. However other audiences will say that this is not our boy, not our criminals, not our problems, it's disgusting, sick, pathological. The author argues that all of us, one way or another, are contaminated with this sickness, and on the screen we see an open form, with obvious symptoms. As a society, we have not yet thought about the destructive power of social activity, not backed by moral ideals, devoid of moral guidelines. Abdrashitov and Mindadze have (Gerber, 1989: 24).

This opinion was challenged by M. Kuznetsova: "I'm infinitely sorry for the boy named Plumbum. I'm tormented by the question: is it right with an unmercifully almighty author's will to load an incredibly heavy weight onto the immature shoulders of a child? All the sad experience of disappointment in people, piles of lies, which a person by the age of forty goes through... multiplied by talent, impassivity of the film director about the most painful moral issues of our time and the nearest past, – all this causes controversy, rejection and – worst of all – misunderstanding. I'm afraid that the younger generation can perceive Plumbum as an example to follow" (Kuznetsova, 1989: 130).

S. Shumakov was even harsher in his assessment: "If the authors of *Plumbum* set themselves the task of waking up the viewer, make him think about the destructive power that the right words can be charged with, what threatens society and people, especially the young, the principle that the goal always justifies the means, – then the authors have achieved their goal. The film certainly hits the mark. It is watched, it is argued about, it touches everyone, including those who do not want to admit it. ... In essence, we are dealing with a trap, an intellectual labyrinth, which it is very easy to get into, but it is almost impossible to get out of it.

The parents' hypocrisy turns into a total imitation of life. Aspiration of their son by any means to reunite the word and the deed turns this life into a dangerous game. Both ways are bad. Where is the way out? The authors do not know. This is not surprising. They faced one of the fundamental questions of our history, culture, social life. ... The authors of the film *Plumbum, or a Dangerous Game* pushed us into the sphere of speculative constructions and abandoned us there. Get out, they say, as you want. We opened the box, showed it, spotlighted it, and it's up to you to decide. But we cannot decide, because there is no image of the human soul in the film. We have no one to feel compassion for, so, there is nothing for our morals. A cold, distant glance, that has no sympathy, kills all life in the picture... And in the end the authors' become captives of their own game. Ruslan Chutko shamelessly manipulates people. It's immoral. But, while proving this to us, the filmmakers themselves did not notice the way they manipulated the hero, lost their moral reference point and found themselves in Plumbum's situation" (Shumakov, 1989: 131-134).

Two years later the theme of an unconventional personality of a school pupil was presented by the director A. Eshpai in a more aesthetic perspective in his film *The Jester* (1988). The main character Valentin is a nice guy, an honors pupil, a son of a professor, a researcher specializing in Japan studies. Valentin's film forerunners, who did not want to put up with the surrounding evil, tried to defeat it with its own weapon (*Plumbum*), escaped into the world of rock music (*The Burglar*), furiously and hopelessly took revenge (*The Blackmailer*), or sarcastically played a simple-hearted mask of a folklore Ivan the fool (*Courier/ Messenger Boy*). Valentin chooses a

different form of confrontation and self-affirmation, perhaps a more sophisticated one – his biting jests stick into a person's self-esteem.

Breaking the narration (based on the story of Y. Vyazemsky) about Valentin Uspensky's life with the subtle vignettes of the chapters, Andrei Eshpai was in no hurry to convict his hero with a guilty verdict. Valya is smart, charming, witty. His "jesters" at first are completely harmless and even justified in their own way. Isn't it fair to play a trick on a self-confident handsome teacher who humiliated a student in love with her? Or to give a verbal injection to a shop assistant, whose rudeness is truly boundless? Valya has a solid philosophical justification for his jests. But, alas, his jests are becoming more and more aggressive. The game gradually turns into a disease. Valya "creates a kind of a space of general buffoonery around him, contempt for others, which is difficult to break out of" (Khloplyankina, 1988: 14).

At first glance, it seems that the visual imagery of the film is too refined for the genre of a quite dramatic comedy. Mists, greenish-pastel colors, luminosity of interiors, unclear fading of bizarre dreams. However, it is surprisingly in harmony with the image of the protagonist, with his low-key, but good manner of dressing, with his outward invisibility, hiding an unshakable confidence in his abilities and powers.

In fact, Valya has only one worthy opponent – a Maths teacher, an ironic skeptic and a brilliant professional. He even resembles Valya in some ways – independent in his judgments and actions, witty. He is the only person, who Valya's tricks won't go down with. Only he can unravel the jester's philosophy. The actor's charisma of I. Kostolevsky suited the role well. To the authors' credit, they were not tempted to offer a trivial solution to the conflict in the form of re-formation of the main character by a talented teacher. The question of Valentin's future remains open.

Cinema of the reformation period reinforced the critical attitude towards the teaching profession. One after another, miserable portraits of unhappy women teachers, whose salary was 20-30 dollars per month, appeared on screen. Thus, the drama *Homo Novus* (1990) featured high school pupils bullying their depressed, gloomy teacher (I. Kupchenko). Moreover, they went as far as kidnapping her only son...The film meticulously depicted details of the characters' boring, dark life. To make the effect more powerful, the authors used black-and-white film, perhaps feeling themselves as cold surgeons operating on a tumour.

School pupils from the drama *Dear Elena Sergeevna* (1988) displayed the similar attitude to their naive teacher. To tell the truth, the story of an appalling blackmail that students initiated to get better exam marks, was presented unconvincingly in the film. Moreover, abstract, constructed image of an idealist teacher deprived the screen character of life authenticity (Sumenov, 1989: 15). It was hardly believable that a teacher in her forties over all the years of her teaching experience had not got to know her pupils. It was also doubtful that an impudent son of a big boss, a straight "A" student, who was going to enter MGIMO university, decides on the criminal act: in real life he would find a safer and more effective way to achieve his goal.

Images of male teachers in perestroika films were as well not positive. For example, director V. Derbenev totally relied on the talent of I. Smoktunovsky in the screen adaptation of V. Tendryakov's novel *60 Candles* (the film had a gloomy title *Black Corridor*, 1988). Smoktunovsky plays a history teacher recalling his far from ideal career. But actor's efforts were not backed up by the script and directing. Literally every shot is too straightforward and didactic. "No, you are not a villain, you're worse, – his ex pupil tells the teacher. – A villain simply violates the rules. But the one who sincerely believes that a white lie is necessary for the humankind, that person makes his meanness a rule. You are not a villain, you are an evil idea!"

The teacher's image is absolutely low leveled in K. Muratova's film *Asthenia Syndrome*, where the teacher Nikolai Alekseevich teaches an English class as if in the desert, in a class where pupils are busy with what not, but not the subject of the lesson. Dethroning of the teacher's image, that had started quite harmlessly, since the rethinking of the theme in *We'll Live Until Monday*, reached its logical end (Shipulina, 2010).

Against such a background, Perestroika films about school often featured teachers' phrases like:
- What if they jump on your head? (*Work on Mistakes*);
- Oh my God, when will I finally retire and get rid of these criminals? (*The Doll*);
- I don't know if there is a borderline that you (pupils) will not cross (*Dear Elena Sergeevna*).

On the wave of easing censorship's bans during Perestroika, some cinematographers thought that it was rather simple to make a film about school. Their formula was: a new sensational play/ novel or a short story used as a scenario basis, dialogues updated with sharp phrases from the current press (about the commodity and food deficit, about the low standard of living of the working people, etc.), and a popular actor invited to play the leading role. Alas, they often forgot a "trifle", which, probably, would not even be worth mentioning if it did not distinguish art from kitsch: artistry. But without it, any, the most beautiful slogans remain just newspaper headlines. Without it the audience is going to see ridiculous theatrics, falseness and overracting, only reinforcing the contrived scenarios.

Something of the sort happened to the drama *On the Outskirts, Somewhere in Town...* (1988), which became anemic, deprived of the author's pain, sluggish collection of cliché situations that were moving about from one "school film" to another in the late 1980s. A tormented teenager associates with shadowy personalities. A "progressive" teacher tries to pull the poor fellow out of the mess. No doubt, such situations do happen. The idea of the film is humane. But the attempt is in vain, since the cast is failing, the script is weak, as well, as director's work. Instead of sincerity and pain, a bad theater and a primitive chronicle reign here...

N.M. Zorkaya in her article published in the year of the release of another revelatory film – *Puppy* (1988) wrote that this "picture is serious, bitter, and tough. It makes one doubt if a praised "glasnost" really triumphed in our lives. In the village where the action takes place, it is unlikely that it will ever triumph. A sixteen-year-old boy, the film protagonist, pays the ultimate price for telling the truth. Without sparing us, the spectators, adult people, the screen unveils the mechanism of isolation and revenge, which throws out the one who dared to say out loud what everyone knows but keeps silent about. This is the only fault of the incautious truth-seeking school pupil, who is only supported by a very young idealist teacher – too fragile support!" (Zorkaya, 1989: 14). In fact, we can agree that in those episodes where the director gave way to improvisation, the story of a truth-loving high-school student who decided to write an expository letter to the central newspaper takes the breath of life. But these episodes, alas, are rare. A surface-deep publicist scenario was composed, essentially, of the "seamy side" stamps: drinking, orgies in a dormitory, corruption, fights, etc. Let's add here the inexpressive acting. All this taken together negated the critical pathos of the film.

However, one should bear in mind that the cinematographic process is one of the most inertial, from the script concept to its screen release, it often takes more than one year. Hence it is clear that a considerable number of films that came out during perestroika period, had been made according to the patterns of the previous epoch (*The White Horse is not My Grief*, 1986; *Hello, Gulnora Rakhimovna!*, 1986; *Leaf Fall in Summertime*, 1986; *Malyavkin and Company*, 1986; *A Very Scary Story*, 1986; *Examination for the Headmaster*, 1986; *We Are Your Children*, 1987, etc.).

Thus, in the comedy *Malyavkin and the Company* (1986), the pioneers are delighted with a personal computer, they search for a missing dog, collect paper for recycling, save a drowning man, and in the finale perform a heartfelt song "Sing, my youth". In the drama *We Are Your Children* (1987), students of the vocational school eagerly go to work in a rural cowshed. And *Examination for the Headmaster* (1986) was just about the only feature film that directly responded positively to the school reform of 1984: the main character of this picture is a young teacher who came to a rural school charged to be a true proponent of pedagogical progress.

Among such late comings was a semi-detective melodrama *A Slap in the Face, That Never Happened* (1987).

A seventeen-year-old boy, contrary to the title of the picture, gives a sonorous slap to his former classmate (a girl), who, out of jealousy, gave a teacher a "compromising document" – a photo of a timid kiss of two high-school students. The boy in the picture was the one she was in love with, the girl was her more successful rival. As a result, the young headmaster calls the police, insists that a criminal case must be initiated against the boy, and the innocent photo is declared nothing less than pornography.

Is it possible to imagine such behavior of a teacher in a Soviet school? Certainly. For example, in a school in 1937 or 1947. Back then, in fact, because of tenth graders' kiss, at times, urgent Komsomol meetings were convened, or politically incorrect school paper article could result in much serious sanctions.

However, the action of the film *A Slap in the Face, That Never Happened* takes place in the second half of the 1980s, when both school and schoolchildren had very different problems. When cases of intimate relations between high school students did not seem sensational, because the problems of drug abuse and other substance abuse were on the agenda. Compared to this, the sterile world of the film seemed archaic and false at that time. Moreover, the actor's pinch (in gestures, facial expressions, intonations), noticeable literally in every episode, plus the negligence of visual techniques, the banality of mise-en-scène and montage.

Perhaps, to a lesser extent, but also rather archaic was *Work on Mistakes* (1988), based on the story of Y. Polyakov. The film was about a young journalist and a teacher of the Russian language and literature who was looking for a manuscript of a writer repressed in 1937. He got a difficult class of students that was led by an irresistible and spoiled "A" pupil, the daughter of a big boss. Maiden love, rivalry, search of a case with the manuscript, stolen from the teacher, a seduction scene, – all this makes the audience involved, although one can feel some things stretched or artificial. For example, why does this versatile group easily become helpful pathfinders searching for a novel that disappeared in the 1937 when the author was arrested? Why does the teacher easily give up, capitulate, throwing his case into the fire? (Zorkaya, 1989: 15).

It should be noted that *Work on Mistakes* was not the only film plot that the politics directly entered. Politically, *The Whistler* (1988) concept was quite sharp, as the beginning of the film featured the scene of the recruitment of a first-year student by a KGB officer. However, later the authors, as if frightened of their "perestroika" courage, changed the situation: the recruiter was not a real agent, but the rector's son. But the leader of the underground circle of students was presented as an ideological fighter against the authorities and organizer of student protests.

An individual place in the "school series" of perestroika period is occupied by few films, the action of which took place in the 1920s and 1930s. On the one hand, we have to admit that the author of the brilliant film about teachers and schoolchildren of the 1920s *The Republic of ShKID* (1966), G. Polok was not able, as they say, to set foot in the same river twice. *Our Calling* (1981), as well as *I am the Leader of the Outpost* (1986) were a pale shadow of his ShKID story. On the other hand, a notable event in the second half of the 1980s was the screen adaptation of the novel *Tomorrow Was the War* by Boris Vasilyev (1987), which first touched upon the theme of Stalin's repressions of the 1930s in the context of school theme. In this drama, young high school students come across manifestations of human betrayal, deception, hypocrisy (which at the state level has already led to the planting of a system of denunciations, arrests and quick massacre (Kudryavtsev, 2006).

4. Results
The perestroika period films (1986-1991) on the school/university topic.
Place of action, historical, social, cultural, political, and ideological context
Historical context (dominant concepts: "media agencies", "media categories", "media representations" and "media audiences").
Features of the historical period when media texts were created, market conditions that contributed to the idea, the process of creating media texts, the degree of influence of that time on media texts.

The timeframe for the historical period has been defined conditionally since 1986 (the beginning of the "perestroika" processes after Mikhail Gorbachev's coming to power) up to 1991 (when the Soviet Union was liquidated by proclaiming the independence of the former Soviet republics).

The main characteristics of this historical period:
- the proclamation of M.S. Gorbachev's policy of "restructuring and glasnost", pluralism, democratization and improving socialism (including holding free elections with alternative candidates);
- the official condemnation of the communist regime's crimes and the rehabilitation of about a million of innocently convicted, and dissidents;
- the gradual abandonment of ideological struggle and the withdrawal of troops from Afghanistan, the proclamation of a disarmament policy;
- a course towards the gradual abolition of censorship bans and the free exchange of specialists and ideas with the West;

- a new "perestroika" impulse to continue the exploitation of the official doctrine of the established common community of the Soviet people and the absence of class, ethnic, national, racial problems in the USSR; the possibility of peaceful coexistence of socialist and capitalist systems (against the background of improving political relations with the U.S. and western European countries);
- an attempt to open the way for private cooperation, i.e. to partially revive the trends of the Soviet "new economic policy" of the 1920s;
- economic (largely due to a steep drop in oil prices) and the ideological crisis that eventually led to an attempt at a conservative coup d'etat in the summer of 1991;
- the disintegration of the Soviet Union in late 1991;

Table 1. Key dates and events in the USSR and worldwide in perestroika period (1986–1991): politics, economics, culture (compiled by A. Fedorov)

Year	Key dates and events in the USSR and worldwide in perestroika period (1986–1991): politics, economics, culture
1986	XXVII Congress of the CPSU: February 25 – March 6. Accident at the Chernobyl nuclear power plant: April 26. V Congress of USSR Cinematographers: a film director E.G. Klimov was elected the chairman of the USSR Cinematographers Union: May. Resolution of the CPSU Central Committee. "On disadvantages of buying and distributing foreign films": June 4. The threefold drop in world oil prices (from $29 to $10 per barrel), which sharply intensified the economic crisis in the USSR: June. The announcement of M.Gorbachev that "perestroika" has begun: June. French President F. Mitterrand visits the USSR: July 7–10. M.S. Gorbachev and R.Reagan meet in Reykjavik: October 11–12. Opening of the Conference on Security and Cooperation in Europe in Vienna: 4 November. The return to Moscow of the nuclear physicist and activist for human rights and peace A.D. Sakharov from a 7 year exile: December 23.
1987	M. Thatcher's visit to the USSR: March 28–April 1. The abolition of most western radio stations' jamming on the USSR territory: May 23. The unauthorized flight of the German amateur pilot M. Rust from Hamburg (via Helsinki) to Moscow (illegal landing on the Red Square): May 27. The 70th anniversary of Soviet power: November 7. Mikhail Gorbachev's visit to Washington. The signing of the treaty on the elimination of medium-range nuclear missiles: December 1–10. M. Gorbachev was declared Person of the Year by *Time*. Low world prices for oil, contributing to a further decline in the economy of the USSR and the standard of living of its population.
1988	The beginning of the withdrawal of Soviet troops from Afghanistan: May 15. M. Gorbachev and R. Reagan meet in Moscow: May 29 - June 2. Chancellor of Germany H. Kohl visits the USSR: October 24–27. French President F. Mitterrand visits the USSR: November 25–26. The abolition of jamming the radio station "Free Europe" on Soviet territory: November 30. Visit of M.S. Gorbachev in New York (UN). His statement on the reduction of the Soviet armed forces and the beginning of the withdrawal of Soviet troops from Eastern Europe: December 6–8. Low world prices for oil, contributing to a further decline in the economy of the USSR and the living standards of its population and to the rising desire of some citizens to (now authorized) emigrate.
1989	The end of the withdrawal of Soviet troops from Afghanistan: February 15. George Bush Sr. becomes the US President.

	Numerous meetings of M. Gorbachev with world leaders (including US President George W. Bush) and his statement on further disarmament. The literary magazine "New World" was the first one in the USSR to publish a book by A.I. Solzhenitsyn "The Gulag Archipelago": July. The 70th anniversary of Soviet cinema: August 27. The fall of the Berlin Wall begins: November 9. The overthrow of T. Zhivkov's regime in Bulgaria: November 10. The victory of the Velvet Revolution in Czechoslovakia: November 24. The victory of the anti-communist opposition in the elections in Hungary: November 26. The victory of anti-communist forces in Romania: December. A.D. Sakharov's death: December 14. Further decline in the economy of the USSR and the living standards of its population, and the growth of emigration.
1990	Consent of the USSR to the unification of Germany: January 30. XXVIII Congress of the CPSU: July 2–13. The USSR gives consent for united Germany to join NATO: July 14–16. Numerous meetings of M. Gorbachev with western countries leaders. Mikhail Gorbachev is awarded the Nobel Peace Prize.
1991	The war in Kuwait between the US and Iraq: January 16–19. World oil prices remain low, which leads to a further decline in the economy of the USSR and the living standards of its population. the Warsaw Treaty after 36 years of military alliance of Central and Eastern Europe states with the USSR disestablished: July 1. The attempt of a coup d'état, organized by the conservative part of the leadership of the USSR: August 19–21. The actual disintegration of the USSR: December 8. Voluntary resignation of Mikhail Gorbachev from the post of the President of the USSR, transfer of power to Boris Yeltsin: December 25. Official disintegration of the USSR: December 26.

How the knowledge of real historical events of a particular period helps to understand the given media texts, examples of historical references in these media texts.

Soviet audiovisual texts of 1986–1991 on the school and university, according to the authorities, were supposed to support the main lines of the then state policy in the educational and socio-cultural spheres, that is, to show that the Soviet system of education, upbringing and culture, while maintaining common ideological guidelines:

- has some challenging issues in education and upbringing, but is being reformed and is capable of changing for the better;

- the teacher-pupils relation continues to be democratic, to some extent creative.

However, these tendencies were characteristic mainly of the initial stage of "perestroika".

At the final stage of perestroika, the absence of state censorship and ideological vacuum resulted in filmmakers' focusing on the acute painful issues of school / university and society.

Social, cultural, ideological, and religious context (dominant concepts: "media agencies", "media categories", "media representations" and "media audience").

- ideology, directions, goals, objectives, world outlook, the concepts of the media texts' authors in the socio-cultural context; ideology, culture of the world, depicted in media texts.

In the perestroika era, the communist ideology in the USSR continued to dominate (although it was gradually criticized by the opposition), but the film industry was under less censorship, than in the past, so school and university themes in Soviet cinema very quickly entered previously forbidden plot territories.

- the world outlook of the characters of the "school world" depicted in media texts

The world view of the characters was increasingly losing its optimism, some films contained shockingly graphic scenes. Films based on the normal Soviet hierarchy of values (communist ideology, collectivism, diligence, honesty, willingness to help people in need) became history. More

and more often the screen was reflecting life realia. For example, the films *Avaria - a cop's daughter* (1989), *Government Facility* (1989) and *Made in the USSR* (1990), were factually based on cases of soulless bureaucracy, lies, violence, substance abuse and other vices of society including school.

Structure and narrative techniques in these media texts (dominant concepts: "media categories", "media technologies", "media languages", "media representations")

Schematically, the structure, plot, representativeness, ethics, features of genre modification, iconography, character characters of audiovisual media texts on school and university topic in the perestroika period can be presented as follows:

- *the location and time period in media texts.* The main location in films is school classes and corridors, schoolyards and flats; the plot is set mostly (if it's not a retro) at the time when the film is made.

- *the environment typical for these media texts, household items*: the furnishings and household items of school films are still modest, however oftener than before wealthy apartments are shown (*Come What May*, 1986; *Temptation*, 1987; *Work on Mistakes*, 1988; *The Whistler*, 1988; *Darling Ap*, 1991, etc.);

- *genre modifications of school and university subjects:* predominantly – drama; filmmakers in the second half of the 1980s, seemingly, decided that a comedy genre was absolutely inappropriate in the hard, incriminating "perestroika film flow";

- *narrative techniques, narrative bias*: positive characters are rarely idealized, and negative ones tend to be presented ambiguously too;

- *typology of characters (character traits, clothing, physique, vocabulary, facial expressions, character gestures, the presence or absence of the stereotypical manner of representing the characters in these media texts): characters' age*: the age of schoolchildren is in the range of 7–17 years, however, teenage characters are most common; the age of other characters (teachers, parents, grandparents, etc.) varies, but adults but adults under 60 prevail; *education level*: corresponding school year for students, teachers presumably have a university degree, supporting characters can have any level of education; *social status, profession*: the financial situation of students is basically the same (although the material inequality of individual characters began to be clearly indicated), they can be either from the families of workers and farmers, or from the intelligentsia. The parents' jobs are diverse; *characters' marital status*: school students, naturally, are not married; adult characters are mostly married, however, single teachers also appear on the screen (resulting in plot twists connected with the love relationships of teachers and students); *appearance, clothing, physique of characters, features of their characters, vocabulary*: the appearance of the characters of school children and students in the films of the perestroika period is within the framework of the canons of the student's image of that time, which was by far more free than in the 1970s.

A frame from the film *Non Slap in the face* (1987) gives an idea of the appearance, clothes, physique of the characters – students of the era of "perestroika".

Fig. 1. A frame from the film *Non Slap in the face* (1987)

Schoolchildren in the films 1986–1991, unlike the "thaw" and "stagnation" periods, have a rather pragmatic life vision, related to material prosperity, or, on the contrary, are in deep depression. Screen teachers often put up with the idea that it is impossible to reform a "bad" student. Perestroika period teachers are even more melancholic than in the films of stagnation period. The professional distance between them and the students becomes even more fragile (that is vividly illustrated in such films as *Come What May,* 1986; *Temptation,* 1987; *Work on Mistakes,* 1988; *The Doll,* 1988; *Dear Elena Sergeevna*, 1988; Avaria – a cop's daughter, 1989; Homo Novus, 1990). Like in films during stagnation period, some screen faculty wear rather casual clothes.

A shot from the movie *The Doll* (1988) reflects the appearance, clothing, physique of the character-teacher of "perestroika" years.

Fig. 2. The frame from the film *The Doll (1988)*

A significant change in the life of media characters and the challenge that the characters face (a violation of the usual life):

Option 1: among the next-door characters, schoolchildren who live a normal life, are those who for some reason do not fit into the standard framework of interpersonal communication and learning process, that is:

- the behave abnormally, sometimes steal (*Come What May*, 1986; *Haunted House*, 1987; *Blackmailer*, 1987; *The Doll*, 1988; *The Whistler*, 1988; *Avaria – a cop's daughter*, 1989; *Government Facility*, 1989; *Made in the USSR*, 1990, etc.);

- try to dominate, subjugate their classmates and/or teachers, acting sometimes violently (*Plumbum of the Dangerous Game*, 1986; *Haunted House*, 1987; *Work on Mistakes*, 1988; *The Doll*, 1988; *Dear Elena Sergeevna*, 1988; *Government Facility, 1989; It Happened by the Sea, 1989; Homo Novus, 1990, The Window, 1991*);

- stand out among classmates (in a good way or in a bad way) so conflict with the rest of the class and / or teachers (*Come What May*, 1986; *Plumbum of the Dangerous Game*, 1986; *Work on Mistakes*, 1988; *The Doll*, 1988; *Dear Elena Sergeevna*, 1988; *Puppy*, 1988; *The Jester, 1988; Dear Ap, 1991, etc.*);

- fall in love (*Come What May*, 1986; *The Slap in the Face that Never Happened*, 1987; *Temptation*, 1987; *Work on Mistakes*, 1988; *Dear Ap*, 1991, etc.).

Option 2: there are extraordinary teachers among faculty - those who also do not fit into the standard school framework, that is, they try to:

- resist the outdated and / or, from their point of view, incorrect methods of the school principal and / or teaching staff and collide with him / them (*White Horse is not My Grief*, 1986; *Examination for the Headmaster*, 1986, etc.);

- establish trust-based relations with the students, no matter how difficult it may be (*Hello, Gulnama Rahimovna!*, 1986; *Leaf Fall in Summertime*, 1986; *Examination for the Headmaster*, 1986; *We are Your Children*, 1987; *The Doll*, 1988; *Work on Mistakes*, 1988; *Accomplice*, 1990, etc.).

Solving the problem:

Option 1 (student-centered): "odd ones out" school students keep their belief, because they do not comply to educational/parental influence (*Come What May*, 1986; Plumbum or the Dangerous Game, 1986; *Work on Mistakes*, 1988; *The Doll*, 1988; *Dear Elena Sergeevna*, 1988; *Avaria- a cop's daughter, 1989; Dear Ap, 1991);*

Option 2 (teachers-centered): unconventional teachers triumph (*Hello, Gulnama Rahimovna!*, 1986; *Leaf Fall in Summertime*, 1986; *We are Your Children*, 1987), lose (*Slap in the Face that Never Happened*, 1987; *Temptation*, 1987; *Work on Mistakes*, 1988; *Dear Elena Sergeevna*, 1988; *Avaria- a cop's daughter, 1989*; *Asthenia Syndrome*, 1989, etc.) or (as in *The Doll*, 1988) the result of their relations with students becomes ambiguous...

We agree with N. Sumenov: a lot of films about school and the youth were limited only to ascertaining acute problems, hence the straightforwardness of oppositions arose: often young film authors held elder generations responsible for the troubles of the young, and older film creators blamed the youth (Sumenov, 1989: 53).

5. Conclusions

Summing up, the films of "perestroika" period (1986-1991) on the school-university theme showed that:

- the education / upbringing process has lost its previous strict storylines, in many respects has lost its communist landmarks;

- school and university have acute problem areas (crisis, disappointment and fatigue, professional "burning out" of teachers, stagnation, hypocrisy, lies, bureaucracy and authoritarianism, pragmatic cynicism of students, teenage cruelty, underage sexual activity, etc.);

- the activity of a student / student again became more directed toward the outside world than to the inner world;

- appropriate distance in the teacher-student relationship has become more fragile (familiarity, sexual relation, or its provocation); in the films *Work on Mistakes* (1988) and *Asthenic Syndrome* (1989), male teachers even fight with high school students in class or in the school corridor;

- the prestige of the pedagogical profession in the eyes of students and the public has fallen even lower; in accordance with the real state of affairs, female teachers' images (often lonely, unsettled) came to the forefront;

- the main conflicts of plots were built on the opposition of non-ordinary teachers and students with stagnation, bureaucracy, mediocre bosses / colleagues / peers.

Actually, one can probably assume that the exposing "black series" of the perestroika cinema (where the youth theme was one of the most prominent ones) served a kind of "mobilizing purpose", only at the time it was not the orientation of "Soviet power elites in the renewal of the tools which they embodied the communist project with" (Belyaeva, Mikhailin, 2015: 551). Conversely, a Western-oriented part of the Soviet ruling elite used "uncensored" cinematography as one of the levers for the gradual liquidation of socialism (Razzakov, 2013: 404-405). On the other hand, it is possible not to attach special importance to this "conspiracy" assumption, believing that Soviet cinematographers spontaneously walked in the wake of political and socio-cultural changes of the "perestroika" era. After all, we should not forget that by the end of the 1980s a paradoxical situation arose in the USSR when the state continued to finance film production, but in the actual absence of censorship, filmmakers could produce all that they wanted, practically ignoring the opinion of the leading bodies of the CPSU and the government.

6. Acknowledgements

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Psychometric properties of the RMARS Scale in High School Students

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Abstract

The purpose of this study was to determine if there is a structure of variables that allows us to understand the level of Anxiety towards Mathematics in high school students from the municipalities of Zacatal and Jamapa, Veracruz, Mexico. This was based on the seminal works of Richardson and Suinn [1972], who developed the Mathematics Anxiety Rating Scale (MARS) instrument with 98 items. This was later modified by Alexander and Martray [1989] to develop the Revised Mathematics Anxiety Rating Scale (RMARS) with only 25 items. For this study, the test was applied to a sample of 200 high school students of first, third and fifth semesters. The reliability of the test was α: 0.934 per item and 0.693 per dimension, which suggests acceptable validity and consistency in terms of what Hair, et al. point out [1979]. For the test of the H1 and H2 hypotheses, Exploratory Factor Analysis with extraction of the Principal Components and the $Chi^2_c > Chi^2_t >$ statistic suggest that, as a whole, the dimensions of the RMARS scale explain mathematical anxiety. In addition, they indicate that anxiety towards mathematics classes is greater than anxiety towards exams and mathematical tasks; all this accounts for 74 % of the assimilable variance. For H3, the ANOVA test is used to show if there is a difference in means. The results suggest that there are no differences by Gender, Age. Or School Grade, although the MATHTEST dimension in Gender, showed differences in variances.

Keywords: beliefs, attitudes, emotions, mathematical anxiety, mathematical exams, numerical tasks, mathematical courses, MARS and RMARS scales.

1. Background

One of the policies promoted by the Organization for Economic Cooperation and Development (OECD) is the achievement of economic growth in the field of employment, as well as a better standard of living in member countries. Derived from the above is the Program for the

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International Assessment of Students (PISA), whose main function is to evaluate reading, mathematics, and science competencies in secondary school students.

In the evaluation carried out in 2015, Mexico was ranked 56 out of 70 OECD countries. In learning of mathematical competence in 15-year-old Mexicans, 56.6 % placed in levels 0 and 1, which means that learning is insufficient. 26.9 % placed in level 2 which means minimal learning; 12.9 % in level 3 which means that learning is satisfactory and only 3.5 % placed at level 4 which represents a good or outstanding learning in mathematical competence.

In 2016, PISA reported that the percentage of Mexican students who did not reach the minimum level in mathematical competence remained the same between the years of 2003 and 2015.

With respect to the gender differences that exist in mathematical performance, men outperform women by seven points and the expectation and interest that Mexican students have towards mathematics is low due to anxiety and concern.

Mexico offers high school studies through several different modalities. For example, there are private schools; there are autonomous schools and technological (vocational) schools. There is also a modality called community *Telebachillerato*. These operate in communities with fewer than 2500 inhabitants where there is no nearby high school; thus, they are rural schools. There are three teachers per school, each teaching different subject areas: mathematics, social sciences, and communication skills. They rely on guided lesson plans and audiovisual materials to cover the curriculum.

In 2017, the results of the National Plan for the Evaluation of Learning (PLANEA) indicate that students score above the national average in autonomous schools, in private schools, and in technological schools, with autonomous schools showing the highest score on average. On the other hand, *Telebachillerato* students obtained the lowest score. Likewise, the gender results showed that the men obtained slightly higher scores in mathematics, which coincides with the results obtained by PISA. Anxiety towards the discipline may play a role in these results.

To evaluate mathematical anxiety, Richardson and Suinn [1972] developed the MARS scale that measures mathematical anxiety, since previous studies had shown that many people suffer it when working with numbers and solving problems. Later, Alexander and Martray [1989] reviewed and modified the instrument to 25 items. They named it RMARS.

Mathematical anxiety includes affective, cognitive and behavioral components. Fennema and Sherman [1976] found that a high number of students decide not to study mathematics due to these, with more women than men making that decision. Thus, their concern to create mathematical attitude scales to obtain more information about women's learning in mathematics.

In the educational context, there has been a great interest in analyzing and understanding the cognitive and behavioral traits that facilitate or hinder students' performance in academic matters, and how these relate to their psychosocial development. Understanding the concepts of self-efficacy and anxiety has contributed to improving teaching-learning practices (Contreras et al., 2005).

The phenomenon of anxiety towards mathematics has been explored for decades (Aiken, 1961, 1976, Brasell et al., 1980, Sandman, 1980, Satake, Amato, 1995, Suinn, Winston, 2003; Adelson, McCoach, 2011; García-Santillán et al., 2014, 2015, 2016 and 2017; Navarro-Ibarra et al., 2017). One such study found noticeable math anxiety present in the behavior of some students when they hear the word mathematics, when performing mathematical tasks, when studying the subject, or when solving an evaluation (Eccius, Lara-Barragán, 2016).

Other studies have given evidence that anxiety towards mathematics differs with respect to gender, age, or academic status among other factors of the student's profile. In this regard, Pérez-Tyteca et al. [2007] analyze the anxiety levels presented by students entering the University of Granada when they are faced with mathematical tasks. They found significant differences between men and women, with men reporting less mathematical anxiety.

In this same line, Martínez-Artero and Nortes [2014] demonstrated in a study carried out among students who are training to be teachers of mathematics, that women have more anxiety than men do. Additionally, age makes a difference; that is, students older than 21 report greater anxiety in comparison with those who are younger (<21 years old).

Very similar to the result obtained by the previous authors, is the study carried out by Nortes & Nortes [2017], where they take a sample of 829 second, third, and fourth grade students from

future primary school teachers. Their findings show significant differences in gender aspects where the level of mathematical anxiety in academic courses is higher in women than in men.

Likewise, a study by Agüero, Meza, Suárez and Schmidt [2017] with a sample of 3,725 students at the secondary level in public school in Costa Rica, found statistically significant differences in relation to mathematical anxiety by gender, since women apparently have higher levels of anxiety towards mathematics than men do. In addition, another interesting data finding is related to the variable degree of education. The study identified that the level of anxiety differs with respect to the students of the third grade versus those who are in other grades, the latter being the students who showed slightly higher levels of anxiety.

Thus, this study aims to answer the following research questions: How do tests, tasks and courses, all of them associated with mathematics, constitute factors that generate anxiety in the student? Does anxiety differ according to gender, age or degree of study?

General Objective:

●Evaluate how tests, tasks and math courses generate anxiety in the student.

Specific objectives:

●Identify which of the three factors explain mathematical anxiety in *Telebachillerato* students in the municipalities of Zacatal and Jamapa, Veracruz.

●Analyze if there are significant differences by gender, age and school grade that explain mathematical anxiety.

Working hypothesis:

H_1 Examinations, assignments and math courses constitute a structure of latent variables that generate anxiety in the student.

H_2 There is at least one factor that explains mathematical anxiety in *Telebachillerato* students in the municipalities of Zacatal and Jamapa, Veracruz.

H_3 There are significant differences by gender, age and school grade in the elements that explain mathematical anxiety.

2. Literature review

This section seeks to explain from theory how the construct of mathematical anxiety has been defined, from the dimensions of beliefs, emotions and attitudes towards exams, tasks and courses. These last three are an essential part of this research.

When Aiken [1961] decides to investigate the effect of attitudes in mathematics, he discovers that they are related to factors of intelligence and achievement, but not to variables such as temperament. In a later study [1976], this author states that changes in attitude toward mathematics imply an interaction between the characteristics of teachers and students, giving greater emphasis to the behavior that is had in the classroom and the didactic techniques that are used for the teaching of mathematics.

In 1968, Dutton and Blum selected a sample of 342 students to apply an assessment and know what they thought of mathematics. They found that students did not like to work with math problems outside of school, nor did they like to commit arithmetical errors. Most agreed that the best way to accomplish this was to avoid arithmetic whenever possible, since they indicated that mathematics was not useful in daily life and that arithmetic was a waste of time.

In seminal studies by Richardson and Suinn [1972], mathematical anxiety involves feelings of tension and anxiety that interfere with the use of numbers and the solution of mathematical problems in daily life and in academic situations. Their MARS scale consists of 98 statements, which gave rise to six factors: general evaluation anxiety, daily numerical anxiety, passive observation anxiety, performance anxiety, mathematical test anxiety and problem solving anxiety.

Later, Suinn et al. [1972], mention a study by Richardson with a sample of 400 university students. He discovered that 28 % showed high levels of tension associated with mathematical situations or the use of numbers and that more than a third of them sought help through therapy in a counseling center, explaining that the reason for consultation was related to mathematics.

Benz [1978] complements the above, stressing that mathematical anxiety was seen as a psychological problem. Psychologists became very much in demand to help design and implement plans for improvement, which included techniques for the general management of anxiety,

modification of irrational beliefs and negative attitudes towards mathematics. The aim was to develop more positive attitudes and self-concepts.

Later, McLeod [1988] studied emotions and feelings about mathematics, analyzed the intervention of attitudes, and found that affective influences in the solution of problems vary in intensity (magnitude) and direction (positive or negative).

In the correlational analysis of Bessant [1995], the author indicated that the interaction between the attitude towards mathematical anxiety and the MARS scale factors depends on the level of anxiety with respect to the experience one has regarding it. It was also found that learning was significant to a specific type of anxiety, to attitudes and to factors of giving instructions. Likewise, the result confirmed the functionality of using teaching-learning theory and instruments to analyze the relationship between the cognitive and affective components in mathematical anxiety.

The results of the meta-analysis research developed by Ma [1999] can be understood as a relationship between mathematical anxiety and performance. Thus, it can be understood as a psychological issue derived from emotional reaction that has beliefs, attitudes, and sensations such as the panic and fear that arise when presented with mathematics.

In this order of ideas, Gil, Blanco, and Guerrero [2005] indicate that positive and negative attitudes have traditionally been studied. However, these authors complement the research with concepts of emotional literacy, which in mathematics education is oriented to the affects, beliefs, attitudes, emotions and feelings as a determining factor to learn, understand and perform in the discipline of mathematics.

Studies conducted by Sánchez, Segovia and Miñán [2011] indicate that teachers' negative attitudes and anxiety can be transmitted to their students. They cite Johnson's [1981] work, and highlight that in his research, the professor's attitude will be reflected in the attitude of the students towards arithmetic and if the attitude is negative, it will cause anxiety and fear. For that reason García-Santillán, Escalera-Chávez and Venegas-Martínez [2013] consider it necessary for the professor to do the work of improving emotional issues so that the student avoids paralyzing himself when he is studying mathematics.

It is important to distinguish between mathematical attitude and attitude towards mathematics. The former refers to the cognitive capacity that the person has; for example, analysis, problem solving, cognitive openness, critical thinking, etc. and the latter has to do with affective capacity, that is, the value and satisfaction that this subject generates (Palacios et al., 2014).

A recent study carried out by Navarro-Ibarra, García-Santillán, Cuevas, and Ansaldo [2017] found a high level of anxiety between mathematics courses and numerical tasks. The students showed less anxiety when they were in mathematics class than when an evaluation was applied and less anxiety between the numerical tasks and the evaluations. They also identified that mathematical attitude is greater when there is a correlation between affective commitment and mathematical confidence followed by the correlation between a commitment behavior and mathematical confidence. Finally, they discovered that the correlation that exists between the affective commitment and the commitment behavior was slightly lower.

It is also important to note that in several studies, anxiety scales towards mathematics have shown a very acceptable Cronbach's Alpha reliability index. Table 1 is an inventory of scales that have been designed to measure this phenomenon of anxiety towards mathematics.

Table 1. Reliability index of math anxiety scales

Year	Author	Anxiety measures test	Items	α
1958	Saranson , Davidson, Lighthall & Waite	Saranson's TASC	30	.85
1968 1988	Cole & Oetting Frank & Rickard	Scale of anxiety towards the Specific Concepts	20	.84/.95
972	Richardson & Suinn	MARS	25	.78/ .95 .96 / 99
1972	Richardson & Suinn	MARS-a	25	.89 / 96

1973	Sztela	Debilitating anxiety towards mathematics scale	10	.83
1975	Spielberger & Guerrero	State-Trait Inventory (IDARE-RE) Pre and Post Experimental	20	.75 / 95
1978	Sepie & Keelin	Mathematics anxiety scale	20	.90
1980	Cruise & Wilkins	Statistics anxiety scale	51	.67 /.94
1981	Meece	Mathematics anxiety questionnaire	19	.81
1982	Plake & Parker	MASC	22	.97
1989	Alexander & Martray	SMARS	25	.71
2007	Muñoz & Mato	Mathematics anxiety scale	24	.71

Source: prepared with data from García-Santillán et al. [2017].

As can be observed, this type of scale has shown a good index of reliability and validity as well as high psychometric properties. In addition, when they have been replicated in different contexts, their results have given significant empirical evidence in this field of knowledge. As an example of this, a study by García-Santillán, Moreno-García and Ramos Hernández [2017] demonstrated that the Three-factor model of anxiety towards mathematics of Richardson and Suinn's MARS scale [1972], modified by Alexander and Martray in 1989 into what is now known as the RMARS scale, can be explained by five factors (Fig. 2), as follows:
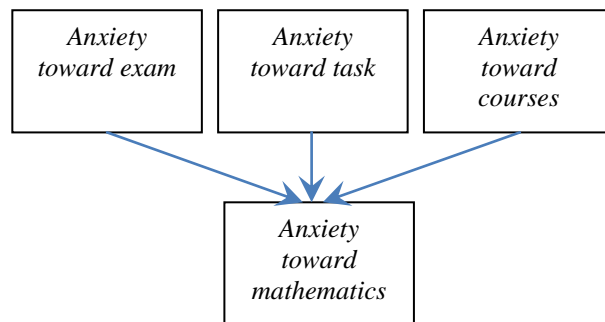
Fig. 1. Three factor model of Richardson & Suinn [1972], modified by Alexander & Martray [1989] taken from Navarro-Ibarra et al. [2017].
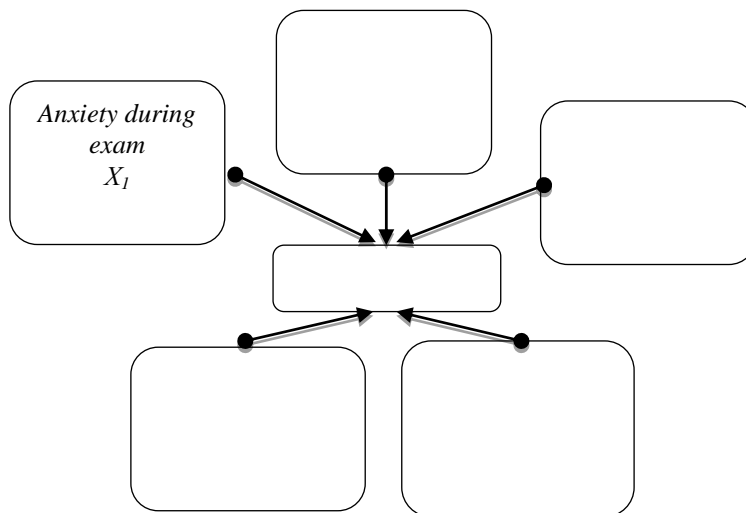
Fig. 2. Penta-dimensional model of mathematics anxiety (taken from García-Santillán et al., 2017)

With these theoretical and empirical arguments, the study is carried out according to the following:

3. Method

The present empirical research is of non-experimental design since the independent variables will not be manipulated, in order not to condition the results and their generalization. Its design is transversal because the data collection was carried out in a single moment of the study. All the surveys were applied during the month of November, 2017.

Since the study focuses on assessing how exams, tasks and mathematics courses are factors that generate anxiety in the student, it is a correlational explanatory study. It seeks to evaluate and explain the whole of underlying variables that would explain the phenomenon of study.

It also seeks to explain if there are differences in means according to gender, age and school grade with respect to the level of anxiety towards mathematics.

Population

The population under study was applied taking as reference the locality of Jamapa, Veracruz in the *Telebachilleratos* of the rural area of El Zacatal and of the Jamapa municipal area, belonging to the School Supervision Zone of Veracruz [2017] that in turn depends on the General Division of *Telebachillerato*.

The population is constituted by the students enrolled in the regular semester June-December of 2017 of a *Telebachillerato* of the public sector, morning shift, where the level of schooling of the students is first, third and fifth semester.

The characteristics of the population are as follows: ages range from 14 to 20 years of age, 55 students belongs to the *Telebachillerato* of El Zacatal and 155 students belong to the *Telebachillerato* of Jamapa. 104 students are male and 96 students are female.

Within the inclusion criteria are students enrolled in this *Telebachillerato*, who are studying first, third, and fifth semester and have agreed to answer the survey voluntarily. It is important to note that at all times the confidentiality of the student's name was maintained.

Sample

For the study in question, of the total population surveyed, they subscribe to a non-probabilistic convenience sample, since the researcher obtained direct contact with the school's educational authorities and was allowed to apply a survey to all current students in that area and moment. The total sample in this case is 200 students.

Our key informants were the students who were supervised by the teacher in turn and by the interviewer for the correct response of the same. The confidentiality of the students surveyed was requested at all times, obtaining only the demographic data.

Instrument

For the purpose of this empirical study, the RMARS scale of Richardson and Suinn [1972] was used, which was modified in 1989 by Alexander and Martray, and which consists of 25 indicators integrated into three dimensions. Table 2 is described below:

Table 2. Structure of the instrument

Definition	Items
Anxiety towards mathematics quizzes	1-15
Anxiety towards numerical tasks	16-20
Anxiety towards mathematics courses	21-25

Source: Taken from Alexander & Martray [1989].

The instrument includes the socio-demographic profile: Gender, Age, School Grade and Locality. It consists of a Likert scaling where the student has to choose between Not at all, A Little, Somewhat, A Lot, and Too Much.

Statistical procedure

For the testing of hypotheses H1 and H2, the Exploratory Factor Analysis (AFE) procedure is used with the extraction of Principal Components (CP). First, Bartlett's of Sphericity test is

calculated from the transformation of the correlation matrix of the determinant, the same determinant that allows us to identify the power of the correlations according to the following:

$$d_R = \left[n - 1 - \frac{1}{6}(2p+5)\ln|R| \right] = -\left[n - \frac{2p+11}{6} \right] \sum_{j=1}^{p} \log(\lambda_j)$$

Where: N = sample size, ln = natural logarithm, $\lambda_j (j=1,..., p)$ values pertaining to R, R= correlations matrix

Likewise, the Chi square test (Chi²), KMO (Kaiser-Meyer-Olkin) and the Sample Adequacy Measure (MSA) with a level of significance $\alpha = 0.01$; all of the above from the following mathematical expressions (Table 3):

Table 3. Mathematical expressions KMO, MSA and Chi²

Bartlett's test of sphericity	KMO and MSA
$$\chi^2 = -\left[n - 1 - \frac{1}{6}(2p+5)\ln|R| \right] = -\left[n - \frac{2p+11}{6} \right] \sum_{j=1}^{p} \log(\lambda_j)$$ Where n= sample size; p= number of variables; ln=Neperian logarithm R= correlations matrix. Satisfying the following element: $$\left[n - \frac{2p+11}{6} \right] \log \frac{\left[\frac{1}{p-m}\left(trazR^* - \left(\sum_{a=1}^{m} \lambda_a \right) \right) \right]^{p-m}}{|R^*| \Big/ \prod_{a=1}^{m} \lambda_a}$$	$$KMO = \frac{\sum_{j\neq i}\sum_{i\neq j} r_{ij}^2}{\sum_{j\neq i}\sum_{i\neq j} r_{ij}^2 + \sum_{j\neq i}\sum_{i\neq j} r_{ij(p)}^2}$$ $$MSA = \frac{\sum_{i\neq j} r_{ij}^2}{\sum_{i\neq j} r_{ij}^2 + \sum_{i\neq j} r_{ij(p)}^2}; i = 1,.....,p$$ Where: $r_{ij (p)}$ is the partial coefficient of the correlation between the variables X_i y X_j in all cases.

Source: own

Therefore, if H_0 is true, the eigenvalues are worth one, its logarithm is null and the test statistic is zero. Otherwise, with high values of Chi₂ and a low determinant, there is evidence of a high correlation. So, if the Critical Value: Chi₂ calculated is> Chi₂ tables, there is evidence for the rejection of H_0. In order to measure the data obtained from the students surveyed, the following is obtained:

Table 4. Matrix of the population under study

Variables
$X_1, X_2,....X_p$
$X_{11} X_{12} ....X_{1p}$
$X_{21} X_{22} ....X_{2p}$
....
$X_{n1} X_{n2} ....X_{np}$

Source: own

If we assume that the common factors have been standardized or normalized $E(F_i) = 0$, Var $(f_i) = 1$, then the specific factor will have a mean equal to zero and the correlation between both factors is $Cov(F_i, u_j) = 0$, $\forall_i = 1,...,k$; $j=1,...,p$. With this consideration: if the factors are correlated $(Cov (F_i, F_j) = 0$, if $i \neq j$; $j, i=1,.....,k)$ we will be talking about a model with orthogonal factors, otherwise, if they are not correlated, it is a model with oblique factors. Hence, the equation can be expressed as: $x = Af + u$ $\hat{U}$ $X = FA' + U$

Where:

Data matrix	Matrix of factorial loads	Factorial matrix
$x = \begin{pmatrix} x_1 \\ x_2 \\ ... \\ x_p \end{pmatrix}, f = \begin{pmatrix} F_1 \\ F_2 \\ ... \\ F_k \end{pmatrix}, u = \begin{pmatrix} u_1 \\ u_2 \\ ... \\ u_p \end{pmatrix}$	$A = \begin{pmatrix} a_{11}a_{12}.....a_{ik} \\ a_{21}a_{22}.....a_{2k} \\ .... \\ a_{p1}a_{p2}.....a_{pk} \end{pmatrix}$	$F = \begin{pmatrix} f_{11}f_{12}.....f_{ik} \\ f_{21}f_{22}.....f_{2k} \\ .... \\ f_{p1}f_{p2}.....f_{pk} \end{pmatrix}$

With a variance equal to

$$Var(X_i) = \sum_{j=1}^{k} a_{ij}^2 + \Psi_i = h_i^2 + \Psi_i; i = 1,.....,p$$

Where the commonality and specificity of the variable Xi is given by:

$$h_i^2 = Var\left(\sum_{j=1}^{k} a_{ij}F_j\right).....y........\psi_i = Var(u_i)$$

The variance of each variable can be divided into two parts: a) in its commonality h_i^2 which represents the variance explained by common factors, and b) specificity $\Box_I$ which represents the specific variance of each variable. Hence we obtain

$$Cov(X_i, X_1) = Cov\left(\sum_{j=1}^{k} a_{ij}F_j, \sum_{j=1}^{k} a_{lj}F_j\right) = \sum_{j=1}^{k} a_{ij}a_{lj} \quad \forall i \neq \ell$$

Source: taken from García-Santillán [2017]

To test hypothesis H3, an ANOVA analysis is developed to test the null hypothesis (H$_o$) of the population means of Mathtest, Mathtask and Mathcourses, versus the alternative hypothesis (H$_a$) that at least one of the scores obtained differs with respect to the expected value.

$$Ho : \mu_1 = \mu_2 = \mu_1$$

$$Ha : \ni \mu_t \neq \mu \_\_\_ j = 1, 2......., K$$

According to the theoretical criteria, to perform the ANOVA calculation it is required that the assumptions of Normality and Homoscedasticity be met: the populations (probability distributions of the dependent variable corresponding to each factor) are normal; The K samples on which the treatments are applied are independent and the populations have all the same variance (homoscedasticity).

Within the ANOVA procedure, the following elements intervene:

Total Variation: $SCT = \sum_{J=1}^{K} \sum_{i=1}^{nj} (x_{ij} = \bar{X})^2$ Intra-group Variation: $SCD = \sum_{J=1}^{K} \sum_{i=1}^{nj} (x_{ij} - \bar{X}_j)^2$

Global Means: $\bar{X} = \dfrac{\sum_{J=1}^{K} \sum_{i=1}^{nj} x_{ij}}{n}$. Inter-group Variation: $SCE = \sum_{J=1}^{K} (\bar{X}_j - \bar{X})^2_{nj}$.

Xij being the i-th value of the j-th sample; nj the size of said sample and $\bar{X}$ its mean. When the null hypothesis is true, SCE/K-1 and SCD/n-K are two unbiased estimators of the population variance and the quotient between them is distributed according to a F of Snedecor with K-1 degrees of freedom in the numerator and N-K degrees of freedom in the denominator. Thus, if H$_o$ is true, then it is expected that the quotient between both estimates is approximately equal to 1, so that H$_o$ will be rejected if said quotient differs significantly from 1.

The following section discusses the data analysis.

4. Data analysis

To answer the main research question and thereby achieve the purpose of the study, we analyze and discuss the data obtained after the statistical processing of the AFE.

In the first place, we proceeded to the validation of the data, starting from the assumption of normality through the K-S statistic of one sample, which determines the level of asymptotic significance ($\alpha > .05$). As can be seen in Table 5, the values of the asymptotic (bilateral) significance give evidence of the level of normality or non-normality of the data. In this case, the three variables have a normal distribution (0.943, 0.078 and 0.307).

Table 5. Kolmogorov-Smirnov test for one sample

		Math Tests	Numerical Tasks	Math Courses
N		200	200	200
Normal parameters (a,b)	Mean	42.5350	13.0600	13.0550
	Absolute Stan. Dev.	12.31042	4.67393	4.71840
Most extreme differences		.037	.090	.068
	Positive	.037	.090	.068
	Negative	-.034	-.042	-.045
Z Kolmogorov-Smirnov		.528	1.275	.967
Asymptotic. sig. (bilateral)		0.943	0.078	0.307

a) The contrast distribution is Normal. b They have been calculated from the data.
Source: own

As can be seen in Table 5, the normality of the data is present in the three variables of the study phenomenon according to the theoretical criteria (Hair et al., 1979). In addition, to measure the reliability and validity of the test, Cronbach's Alpha index is calculated to obtain the correlations between the items of the instrument whose minimum acceptable value is 0.70 (Oviedo, Campo-Arias, 2005), since the closer to 1 the result, the greater the reliability of the scale used.

For this study, the following coefficients were obtained: individual (0.934), grouped in three dimensions (0.693), in both cases yielding acceptable values, which confirms the validity of the instrument (Table 6).

Table 6. Case processing summary

		N	%	α Individual	α Grouped
Cases	Valid	200	100	0.934	0.693
	Excluded[a]	0	0	Items	Items
	Total	200	100	25	3

 a. The elimination by list is based on all the variables of the procedure.
Source: own

Tables 7 and 7.1 show the mean descriptive statistics and standard deviation of the variables grouped by dimension and individually (25 items): This is the basis for calculating the coefficient of variation to identify the variable (s) with the greatest variation with respect to the rest.

Table 7. Descriptive statistics

	Mean	Standard deviation	Number of analyses	CV=DVμ
Math Tests	42.54	12.3104	200	28.94%
Numerical Tasks	13.06	4.6739	200	35.79%
Math Courses	10.44	3.8378	200	36.76%

Source: own

Table 7.1. Descriptive statistics

	Mean	Typical deviation	Number of analyses	CV=DVμ
Math Course21	2.25	1.27	200	56.75%
Math Tests12	2.63	1.37	200	52.29%
Math Course23	2.51	1.30	200	51.77%
Math Course25	3.01	1.46	200	48.63%
Numerical Tasks19	2.52	1.19	200	47.50%
Numerical Tasks18	2.50	1.17	200	47.03%
Math Tests5	2.50	1.17	200	46.94%
Math Course22	2.68	1.25	200	46.80%
Math Course24	2.62	1.21	200	46.16%
Numerical Tasks17	2.45	1.13	200	46.07%
Math Tests10	2.93	1.34	200	45.72%
Math Tests3	2.61	1.17	200	44.92%
Math Tests7	2.67	1.20	200	44.87%*
Math Tests11	2.69	1.18	200	43.95%*
Numerical Tasks20	2.60	1.13	200	43.45%
Math Tests14	2.80	1.20	200	43.09%
Math Tests9	3.16	1.34	200	42.52%
Numerical Tasks16	3.00	1.26	200	42.14%
Math Tests15	2.84	1.19	200	41.83%
Math Tests2	2.83	1.17	200	41.30%
Math Tests13	2.94	1.21	200	41.01%
Math Tests8	3.02	1.21	200	39.97%
Math Tests4	3.12	1.24	200	39.69%
Math Tests6	3.08	1.20	200	38.98%
Math Tests1	2.76	1.03	200	37.44%
Mean coefficient of variation				44.83%*

Source: own

The results of Table 7 show that numerical tasks and mathematical courses have a higher coefficient of variation with respect to mathematical exams. Table 7.1 shows items of the Mathcourse dimension (items 21, 23 and 25) that show the greatest variation with respect to the others and above the mean (44.83 %) are several of the items grouped by the NumericalTask dimension (items 19, 18, 17).

On the other hand, we must justify that the AFE is a suitable technique for data analysis. Hence, Table 8 and 8.1 show the values obtained from Bartlett's test of Sphericity with Kaiser

(KMO), Chi square with n gl, the significance α <0.01 as well as the Sample Adequacy Measures by variable (MSA), all by grouped dimensions and by items (25 items).

Table 8. KMO Test and Bartlett's test of Sphericity (by grouped dimensions)

Kaiser-Meyer-Olkin measure of sampling adequacy		0.720	MSA	
Bartlett's Sphericity Test	Approx. Chi-squared	218.036	Math test	0.730[a]
	gl	3	Math task	0.734[a]
	Sig.	0.000	Math courses	0.697[a]

Source: own.

Table 8.1. KMO Test and Bartlett's test of Sphericity (by items)

Kaiser-Meyer-Olkin measure of sampling adequacy		0.917	MSA	
Bartlett's Sphericity test	Approx. Chi-squared	2679.407	The values range are between of 0.96[a]	
	df	300	(MathTest10) to 0.81[a]	
	Sig.	.000	(MathCourse23)	

Source own

In the previous table, acceptable values of the KMO (0.720), Chi^2 with 3 degrees of freedom (218.036) are observed, as well as the significance <0.00 and the MSA values, the latter all exceed the theoretical threshold that establishes that they should be > 0.5 (0.730a , 0.734a; 0.697a), all by grouped dimensions and Table 8.1 shows the values KMO (0.917), Chi^2 with 300 degrees of freedom (2679.407), as well as the significance <0.00 and the MSA values, all exceeding the theoretical threshold that states that they should be > 0.5

On the other hand, the linear correlations between the analyzed variables are shown, both grouped and individually. In addition, the correlation matrix in Table 9 provides evidence of positive and significant correlations (> 0.5), although the determinant is not as close to zero as suggested by the theoretical criteria (Hair et al., 1979).

Table 9. Correlation matrix[a]

		MathTests	NumericalTasks	MathCourses
Correlation	MathTests	1.000	.584	.630
	NumericalTasks		1.000	.626
	MathCourses			1.000

a. Determinant = .331
Source: own.

Likewise, Table 9.1 shows positive correlations in all the items, as well as the value of the determinant close to zero. This provides evidence of significant correlations as suggested by the theoretical criteria (Hair et al., 1979).

Table 9.1. Correlation matrix ([a])

	Math Tests1	Math Tests2	Math Tests3	Math Tests4	Math Tests5	Math Tests6	Math Tests7	Math Tests8	Math Tests9	Math Tests10	Math Tests11	Math Tests12	Math Tests13	Math Tests14	Math Tests15	Numerical Tasks16	Numerical Tasks17	Numerical Tasks18	Numerical Tasks19	Numerical Tasks20	Math Course21	Math Course22	Math Course23	Math Course24	Math Course25
Math Tests1	1																								
Math Tests2	0.57	1																							
Math Tests3	0.47	0.62	1																						
Math Tests4	0.48	0.52	0.5	1																					
Math Tests5	0.34	0.21	0.3	0.3	1																				
Math Tests6	0.44	0.42	0.4	0.4	0.3	1																			
Math Tests7	0.37	0.3	0.2	0.4	0.3	0.5	1																		
Math Tests8	0.45	0.33	0.3	0.5	0.3	0.4	1	1																	
Math Tests9	0.46	0.34	0.3	0.4	0.3	0.5	1	0.7	1																
Math Tests10	0.36	0.24	0.2	0.3	0.4	0.4	1	0.5	1	1															
Math Tests11	0.45	0.43	0.4	0.5	0.3	0.5	0	0.4	0	0	1														
Math Tests12	0.4	0.42	0.3	0.4	0.2	0.4	0	0.5	0	0	0	1													
Math Tests13	0.35	0.38	0.3	0.4	0.3	0.4	0	0.5	1	0	1	0	1												
Math Tests14	0.54	0.38	0.3	0.3	0.5	0.5	1	0.6	1	1	1	0	1	1											
Math Tests15	0.47	0.44	0.3	0.4	0.4	0.4	0	0.5	1	0	0	0	1	1	1										
Numerical Tasks16	0.38	0.31	0.2	0.3	0.3	0.3	0	0.3	0	0	0	0	0	0	0	1									
Numerical Tasks17	0.31	0.3	0.2	0.2	0.4	0.2	0	0.4	0	0	0	0	0	0	1	0	1								
Numerical Tasks18	0.35	0.25	0.2	0.2	0.3	0.2	0	0.4	0	0	0	0	0	0	0	0	1	1							
Numerical Tasks19	0.34	0.2	0.2	0.2	0.4	0.3	0	0.3	0	0	0	0	0	0	0	0	1	1	1						
Numerical Tasks20	0.28	0.19	0.2	0.2	0.3	0.3	0	0.3	0	0	0	0	0	0	0	0	1	1	1	1					
Math Course21	0.38	0.32	0.4	0.3	0.4	0.2	0	0.3	0	0	0	0	0	0	0	0	0	0	0	0	1				

Math Course22	0.41	0.25	0.3	0.3	0.5	0.3	0	0.5	0	0	0	0	0	0	0	0	0	0	0	0	1	1		
Math Course23	0.26	0.4	0.4	0.4	0.2	0.2	0	0.3	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	
Math Course24	0.32	0.28	0.3	0.2	0.3	0.3	0	0.4	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	
Math Course25	0.31	0.18	0.1	0.2	0.4	0.2	0	0.4	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1

Determinant = 7.42E-007
Source: own

Next, Table 10 shows the matrix of component and communalities under the criterion of eigenvalue > a 1. The table shows the factorial weights obtained by each of the dimensions of the RMARS scale used, as well as the proportion of the variance represented by their communalities, whose sum represents the self-value and the total percentage of the variance explained. It is also observed that the only extracted component collects factorial weights> to 0.5 of each of the three factors.

Table 10. Component matrix[a] and extraction of communalities

Variables	Component 1	Commonalities
MathTests	0.856	0.732
NumericalTasks	0.854	0.729
MathCourses	0.875	0.766
Eigenvalues	2.227	
Total variance explained	74.223%	
Extraction method: analysis of main components.		
[a] 1 extracted components		

Source: own.

As can be seen in Table 10, the factorial weights are > 0.5 and the square of them shows the proportion of the variance represented by their commonality (Ψ). The three factors integrate a component whose weight of 2.227 of the Eigenvalue accounts for 74% of the total variance explained by anxiety towards mathematics. The variables that explain the component are hierarchized in the following way: MathCourses (0.875) followed by MathTest (0.856) and finally MathTasks (0.854).

In the same way, the extraction of the main components was carried out, using the Varimax rotation method with Kaiser Standardization. The rotated components show a perfect order as indicated by Alexander and Martray (1989). That is, the dimensions of Anxiety towards tasks, exams and courses, all associated with mathematics, constitute a set of variables that explain the phenomenon of mathematical anxiety, as shown in Table 11.

Table 11. Matrix of rotated components[a]

	Component		
	1	2	3
NumericalTasks	.917		
MathTests		.916	
MathCourses			.902

Extraction method: analysis of main components. Rotation method: Varimax with Kaiser normalization.
The rotation has converged in 5 iterations.

Source: own.

With the previous analysis, we can say that hypotheses H_1 and H_2 are checked. If there is a set of latent variables that explain mathematical anxiety, the value of the calculated Chi^2 gave evidence of this assertion, since the calculated Chi^2 exceeds the theoretical criterion of theoretical Chi^2 in both cases. In addition, anxiety is explained by at least one factor as indicated in Table 10 and in the rotated matrix described in Table 11.

Now, according to the three-factor model of Alexander and Martray [1989] and the resulting model of five factors of García-Santillán et al [2017], the extraction analysis is now carried out by the factors criterion. Table 11.1 shows the matrix rotated by items.

Table 11.1. Matrix of rotated components ([a])

	Component			
	1	2	3	4
Math Tests9	0.777			
Math Tests7	0.743			
Math Tests8	0.731			
Math Tests14	0.679			
Math Tests13	0.643			
Math Tests6	0.639			
Math Tests11	0.596			
Math Tests10	0.566			
Math Tests15	0.530			
Numerical Tasks18		0.839		
Numerical Tasks19		0.802		
Numerical Tasks20		0.765		
Numerical Tasks17		0.749		
Math Tests3			0.744	
Math Tests2			0.718	
Math Course23			0.676	
Math Tests4			0.600	
Math Course21			0.540	
Math Course22				0.780
Math Course25				0.687
Math Course24				0.575
Math Tests5				0.575

Extraction method: analysis of principal components. Rotation method: Varimax with Kaiser normalization.

Source: own

The result is surprising; unlike the models shown in Fig. 1 and 2, four components are now obtained. This fact leads us to think that the RMARS scale, applied in Latin contexts, reclassifies the items into other components. Table 12 describes the extracted components resulting from the rotated matrix.

Table 12. Extracted components

Component 1	Component 2	Component 3	Component 4
9.- Think about an upcoming math exam one hour before (0.777) 7.- Think about an upcoming math exam one week before (0.743) 8.- Think about an upcoming math exam one day before (0.731) 14.- Study for a math exam (0.679) 13.- Open a math or physics textbook and see a page full of problems (0.643) 6.- Receive an assignment with several difficult problems which must be turned in the following class (0.639) 11.- Grab a math book to start a difficult task that involves reading mathematical theory (0.596) 10.- Realize you have to take math classes during the three years of middle and high school (0.566) 15.- The moment you receive a test during a math class (0.530)	18.- Receive a series of subtraction problems to solve (0.839) 19.- Receive a series of multiplication problems to solve (0.802) 20.- Receive a series of division problems to solve (0.765) 17.- Receive a series of numbers to add on paper (0.749	3.- Present a quiz during a math class (0.744) 2.- Present the math section of an institutional exam(0.718) 23.- Register for a math class (0.676) 4.- Present the final exam during a math class (0.600) 21.- Buy a math textbook(0.540)	22.- Watch the teacher solve a math equation on the board (0.780) 25.- Enter math class (0.687) 24.- Listen to another student explaining a math problem to someone else (0.575) 5.- Grab a math book to start an assignment (0.575)

Source: own

Under the criterion of factorial loads > 0.5 in the component extraction procedure, the following items are left out: item 1 (Study for a mathematics test), item 3 (Present a quiz in a mathematics course), item 16 (Do mental calculation). In this way the rotated component matrix is made up of four components, which are explained in the final discussion section of the results and conclusions.

Thus, for the test of H3 hypothesis of difference of means with respect to gender, age and school grade, the result shown in Table 13 is obtained.

Table 13. Test of homogeneity of variances by Gender, Age, and School Grade

	Levene's test	gl1	gl2	Sig.
	Gender			
MATHTEST	.080(a)	1	198	.777
MATHTASK	.334(b)	1	198	.564
MATHCOURSES	.008(c)	1	198	.928
	Age			
MATHTEST	.302(a)	1	197	.583
MATHTASK	1.378(b)	1	197	.242

MATHCOURSES	3.461(c)	1	197	.064
		School grade		
MATHTEST	1.147(a)	2	197	.320
MATHTASK	2.147(b)	2	197	.120
MATHCOURSES	.059(c)	2	197	.943

a Groups with a single case will be ignored when calculating the homogeneity of variance test for MATHTEST.
b Groups with a single case will be ignored when calculating the homogeneity of variance test for MATHTASK.
c Groups with a single case will be ignored when calculating the homogeneity of variance test for MATHCOURSES.

Source: own

Table 13 shows the Levene statistic that allows us to test the hypothesis of equality of population variances. Since the value of significance is greater than 0.05, the null hypothesis of equality of variances is accepted. That is, the sampled populations have the same variance, which leads us to reject the alternative hypothesis that states that there is a difference of means in at least one of the populations.

On the other hand, Table 14 shows the ANOVA analysis, with the F statistic with its level of significance for each group (gender, age and school grade), which are greater than 0.05. This allows us to accept the null hypothesis, that is, there is sufficient evidence to indicate that there is no significant difference between the groups in terms of the elements that explain mathematical anxiety. However, the value of the significance for the MATHTEST dimension in relation to gender seems to present a difference in their means as indicated by the F statistic (3.739) and the significance less than 0.05 (0.025). This makes us suppose that if there is a difference. The Levene statistic suggests the rejection of the alternative hypothesis, that is, that there is no evidence to reject the null hypothesis of equality of variances.

Table 14. ANOVA

Factor		F	Sig.
MATH TEST	Gender	3.739	.025
MATH TASK		.869	.421
MATH COURSES		.565	.569
	Age		
MATH TEST		.020	.980
MATH TASK		.030	.971
MATH COURSES		.433	.649
	School grade		
MATH TEST		.006	.994
MATH TASK		.618	.540
MATH COURSES		.281	.755

Source: own

5. Discussion and conclusions

Based on the purpose of the study, we focused on evaluating the factors that underlie the phenomenon of anxiety towards mathematics. The foregoing based on the data revealed by the OECD in the evaluation carried out in 2015, where Mexico ranks 56 out of the 70 OECD member countries in terms of learning and mathematical competence among 15-year-olds. 56.6 % is at level 0 and 1 which means that learning is insufficient, 26.9 % is at level 2 which means minimal learning, 12.9 % is at level 3, which means that learning is satisfactory and only 3.5 % is at level 4, which represents good or outstanding learning in mathematical competence.

These figures are not entirely satisfactory; if we consider that the average age of access to high school ranges from 15 to 17 years, and is the prelude to entry to higher education.

In this study, we used the RMARS scale, which presented acceptable indicators of internal consistency with Cronbach's Alpha scores for all items of 0.934 and a grouped 0.693, which shows a concordance with the reliability indexes collected in studies by García-Santillán et al. [2017].

Among the important findings in this empirical study carried out among *Telebachillerato* students from the municipalities of Zacatal and Jamapa in the state of Veracruz Mexico, they show empirical evidence to affirm that mathematical anxiety depends on 74.22 % of the variables, mathematical exams, numerical tasks, and mathematical courses. This means that if these variables are present in *Telebachillerato* students the level of anxiety towards mathematics will be high.

However, undoubtedly the most important finding appeared when analyzing the data through the statistical procedure of extraction of components by the factor criterion. This refers to the matrix of rotated component obtained (Table 11.1), since the data aligned to a model of four factors, not the three of Alexander and Martray, nor the five factors that García-Santillán et al [2017] obtained as shown in Fig. 1 and 2.

Now, analyzing the indicators that were grouped in each one of the extracted components, we could think that the sense and interpretation that the students give to each one of these items, changes depending on the context; that is a population studied in Mexican territory may differ in interpreting.

In this way, considering the original items that integrate each dimension of the scale used by Alexander and Martray [1989], versus the accommodation or reclassification obtained in this study, the following is shown in Table 15: the result obtained from the four factors in the rotated component matrix.

It is important to note that the extraction test of rotated components was done using the Varimax method with loads greater than 0.55, so items that did not present loads higher than this criterion are excluded in the procedure (1, 12, 16 and 23).

Table 15. Comparison of components vs. Extracted components

Dimension	Items of the original scale	Extracted components	Concordance
MATHTEST	1-15	6, 7, 8, 9, 10, 11, 13, 14, 15	Coincide
MATHTASK	16-20	17, 18, 19, 20	Coincide
MATHCOURSES	21-25	2, 3, 4, 21, 23	2, 3, and 4 are reclassified
Mathematic interaction		5, 22, 24, 25,	Items that are reclassified in a new component associated with mathematical interaction

Source: own

As can be seen in the previous table, the items of the MATHTEST component coincide with that presented by Alexander and Martray, as does the MATHTASK component. However, items 2, 3 and 4 of the MATHTEST component are now aligned to the MATHCOURSES component, which leads us to think that presenting a quick quiz or exam, a final institutional exam in the mathematics course, associates it with the dimension of anxiety towards the mathematics course.

Regarding the fourth component, observing a teacher solving an algebraic equation on the blackboard, entering the math class, listening to another student explaining a mathematical formula to someone else and grabbing a math book to start an assignment, could well be interpreted as an interaction with mathematics. The reclassification of these items in the fourth component leads us to think that the Latino student perceives in a different way the items of the scale designed by Alexander and Martray [1989].

Other important findings are shown in Tables 16, 17 and 18, which refer to the descriptive statistics by gender, age and school grade, respectively, where the mean and standard deviation are specified, which allows the coefficient of variation to be obtained algebraically (Ds / μ), and in this way identify the greater variation that they present with respect to the rest of the variables.

Table 16. Descriptive statistics by gender

	Gender	Number	Mean	Standard deviation	CV=DVμ
MathTests	Male	104	40.27	12.61	31.32%
	Female	96	44.97	11.54	25.67%
	Total	200	42.53	12.31	28.94%
NumericalTasks	Male	104	12.65	4.75	37.58%
	Female	96	13.51	4.56	33.83%
	Total	200	13.06	4.67	35.79%
MathCourses	Male	104	12.87	4.81	37.38%
	Female	96	13.25	4.63	34.96%
	Total	200	13.05	4.71	36.14%

Source: own.

The results of Table 16 indicate that males have a higher coefficient of variation with respect to mathematical exams, numerical tasks and mathematical courses. So specifically in this population we can highlight that this finding is in contrast with studies shown by Pérez-Tyteca et al. [2007], Rosário et al. [2008], Martínez-Artero and Nortes [2014] and Agüero et al. [2017], where they point out that males have a lower level of anxiety than women.

Findings of the descriptive statistics by Age are shown in Table 17:

Table 17. Descriptive statistics by Age

	Age	Number	Mean	Standard deviation	CV=DVμ
MathTests	from 12 to 15	92	42.5	12.60	29.67%
	>15 < to 20	107	42.54	12.16	28.59%
	>20 < to 23	1	45	0	0.00%
	Total	200	42.53	12.31	28.94%
NumericalTasks	from 12 to 15	92	13.09	4.42	33.75%
	>15 < a 20	107	13.03	4.92	37.75%
	>20 < a 23	1	12	0	0.00%
	Total	200	13.06	4.67	35.79%
MathCourses	from 12 to 15	92	12.94	4.28	33.08%
	>15 < to 20	107	13.18	5.08	38.57%
	>20 < to 23	1	9	0	0.00%
	Total	200	13.05	4.71	36.14%

Source: own.

In this table we can see that the highest coefficient of variation for the mathematical exams is the age of 12 to 15 years. That is, those who are in this age range generate greater mathematical anxiety when they know that they are going to take an exam, while for numerical tasks and mathematical courses it is age > 15 < to 20. This means that those who are in these ages represent a higher level of anxiety when doing numerical tasks and attending mathematical courses (math

class). These results coincide with the research of Martínez-Artero and Nortes [2014] which found that at higher age the level of mathematical anxiety increases.

Finally, in Table 18 we find the descriptive statistics by School Grade:

Table 18. Descriptive statistics by School Grade

	Grade	Number	Mean	Standard deviation	CV=DVμ
MathTests	First	113	42.61	13.12	30.80%
	Third	68	42.42	11.08	26.13%
	Fifth	19	42.42	12.07	28.48%
	Total	200	42.53	12.31	28.94%
NumericalTasks	First	113	13.23	5.03	38.08%
	Third	68	12.58	4.06	32.25%
	Fifth	19	13.73	4.55	33.17%
	Total	200	13.06	4.67	35.79%
MathCourses	First	113	13.16	4.71	35.83%
	Third	68	12.73	4.58	36.04%
	Fifth	19	13.52	5.33	39.46%
	Total	200	13.05	4.71	36.14%

Source: own.

The results of Table 18 indicate that the highest coefficient of variation for the mathematical exams and for the numerical tasks is found in the students who attend the first semester. This means that those who have just entered *Telebachillerato* suffer greater mathematical anxiety, unlike those in the Fifth Semester who show a higher coefficient of variation when taking the subject. This is related to the studies of Agüero et al. [2017] by identifying significant differences in mathematical anxiety between one school grade and another.

Final considerations and future research

Finally this result leads us to a reflection, especially if we consider that the three-factor model of Alexander and Martray [1989] is met with some items that are grouped in the dimensions described in Table 2 (MATHTEST, MATHTASK, MATHCOURSES), but in the extraction of rotated components it has four components, which leads to a reclassification of the original items, as previously discussed.

Of course, these findings are significant and should lead to empirical studies in other populations. That is, it would be convenient to carry out research to discover how mathematical anxiety is present in the teachers of that sector evaluated (*Telebachillerato*) in order to demonstrate how it influences students.

Similarly, it would be convenient to investigate if there are elements that explain mathematical anxiety in rural contexts at all educational levels, both in students and teachers, in order to have elements that justify and allow us to design strategies to improve the teaching-learning of the mathematics in those populations.

Finally it is suggested to extend the research to another context, for example, the family. Within the family, it would be interesting to know how this apparent rejection towards mathematics is present, and if it generates anxiety towards mathematics in other family members. This could give evidence of whether or not it is a significant factor affecting what young people think regarding exams, numerical tasks, and mathematical courses.

The current challenge of education focused on the national strategy of the new educational model, seeks among other things, to reduce the gap that exists in the use of mathematical skills in the Mexican student. Hence, the importance of knowing and understanding the beliefs, attitudes and emotions that cause anxiety towards mathematics. This would lead us to develop action plans

in the search to increase the level of understanding and mathematical ability in teaching-learning. Getting students to understand mathematical benefits and their multiple applications in daily life in the mind of the student would help change thoughts and feelings of rejection, to acceptance.

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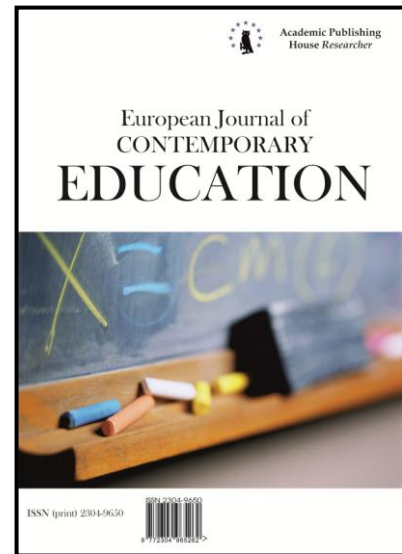
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Organizational and Pedagogical Conditions for the Development of Professional Competencies in the Technical Students' Individual Work through the Example of Studying the Discipline «Hydraulics and Fluid Mechanics»

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Abstract

The urgency of the given problem is caused by the necessity to develop an innovative education system capable of producing highly qualified specialists with a wide range of social and professional activities and broad-based abilities ready for individual operating innovative activities.

The article is intended to searching for the ways of scientifically based organization of students' individual work which is one of the most up-to-date area of a pedagogical research (focus), contributing to the development of professional competencies and the optimization of higher technical education.

The leading method of the given problem research is the pedagogical experiment, which makes it possible to identify, theoretically substantiate and experimentally test the organizational and pedagogical conditions for the development of professional competencies in the students' individual work.

In this research students' individual work is considered as an important pedagogical subsystem of the educational process, built with regard to its essential characteristics on the competency based and learner-centered approaches; at the same time, organizational and pedagogical conditions are realized: subject-subject relations between the teacher and students are built up, the prolonged differential tasks are used in the educational process with their gradual complication from adaptive to developing and constructive in the process of studying the academic disciplines, the development of professional competencies is regularly monitored.

The scientific and methodological materials presented in the article, used in the practice of professional education, ensure the development of professional competencies in the individual work of technical university students and streamline the workflow of the institutions of higher professional education improving the quality of education.

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1. Introduction

Significant changes taking place in the society at the modern stage, moving from industrial to information-oriented society have demanded the improvement of Russia's educational system and higher technical education as well. In the context of the Bologna Process, the Russian system of higher education must compliant with European standards for the training of a highly-competent specialist capable of continuous professional self-improvement, with competences that would enable him to use them actively in professional activities (Gazaliev et al., 2004; Berulava, Berulava, 2010; Shaidullina et al., 2017). In Russia, in vocational education competency-based approach began to be implemented through the development of students' competencies, developed on the basis of professional standards (Mikhaylichenko, Gromova, 2011).

In the light of the before-mentioned, from our point of view, the development of various types of individual work emerges full blown for higher technical universities.

The significance of individual work is greatly growing up due to the increase in the volume of scientific and practical information.

According to the opinion of many scientists, individual work forms at students the necessary volume and level of knowledge, skills and abilities for solving cognitive tasks at every step of training (Pidkasistyi, Korotyaev, 1985), and develops mental set to systematic knowledge and skills acquisition. Individual work is one of the major conditions for student's self-organization in mastering the methods of professional activity.

In the context of the outlined problem, the implementation of the learner-centered approach seems to be productive for the organization of students' own activity, which improves the raising of professional development level.

The Russian Association of Engineering Education conducts public and professional accreditation of educational programs in Russian universities in engineering areas and occupations in accordance with international standards. The RAEE makes demands on graduates of engineering professions taking into account native and global trends. The basic requirements for professional competencies are reduced to the ability of graduates to deal with complex and innovative engineering challenges. Accreditation of educational programs contributes to the development of education and its further improvement.

Competencies are designed on the basis of the professional duties of the employee, but the understanding of competences which is put in the modern educational standards is not adapted. Such extremely generalized formulations of competencies leave considerable freedom for higher educational institutions in planning, organizing and measuring of learning outcomes. Freedom in determining learning needs or learning outcomes has required from higher school the solution of qualitatively new tasks in pedagogical activity.

2. Materials and Methods

Theoretical and empirical research methods were used: analysis of philosophical, pedagogical, psychological and methodical literature on the research problem; method of didactic modeling, discussion, questioning, questionnaire, testing of students, observation, generalization of pedagogical experience, pedagogical experiment, analysis and generalization of experimental data, methods of mathematical statistics. The methods of mathematical statistics include the statistical processing of data that was obtained during the experimental work. For the processing of the data obtained, the technique "Theory of Latent Variables" was applied, the criterion U of Mann Whitney was calculated and the angular transformation of Fisher were calculated. The choice of Mann Whitney's U criterion is based on the fact that the criterion is one of the most common and is used to assess the differences in severity for two unrelated samples, and the number of subjects in the samples may vary. The application of the criterion is most convenient in these cases when the samples are small in terms of the number of subjects (Ermolaev, 2003).

"The theory of latent variables", which is based on the Rasch model allows also to assess the quality of the measuring instrument. Every measuring tool had Chi-square that is greater than critical value at a significant level of 0.05 statistics, allowing you to use them as measuring tools.

The study measured locus of control. The definition of the control document was carried out according to the experimental-psychological method developed on the basis of the scale of the G. Rotter's locus of control in the Research Institute. Bekhterev and published by E.F. Bazhinym in co-authorship with E.A. Golynkoy and A.M. Erkind (Bazhin et al., 1984). The authors note the high reliability of the test. Validity is proved by the relationships of the questionnaire scales with other personality traits that were measured using the 16-PF Cattel's test.

Also according to the method, T.D. Dubovitskaya determined the level of motivation of students to learning. The methodology is characterized by a high degree of reliability and validity, calculated according to the formula of Rylon, the indicator was 0.933, and the value of the Student's criterion significantly exceeded the one-percent level of significance (Dubovitskaya, 2002).

A set of tasks was developed for assessing the operational-effective criterion in the discipline «Hydraulics and fluid mechanics» in branch of the University.

The trial facilities of the research was a Branch of Ufa State Petroleum Technological University in the City of Oktyabrsky, Republic of Bashkortostan. The study covered 265 students, activities among students in the second and third years, full-time, part-time and correspondence forms of training.

The study was conducted in three stages.

At the first stage the analysis of available sources in the domestic and foreign literature on the research problem was carried out; the experience of an individual work organizing in the institutions of higher education of the humanitarian and technical profile was studied; the study on up-to-date requirements to vocational training of technical university students was conducted; professional competencies were specified; the set of competencies was determined; a criterial-evaluation tooling for determining the development of professional competencies was revealed and justified; the organizational and pedagogical conditions were justified.

At the second stage, the formative experiment was carried out to verify the developed organizational and pedagogical conditions for the development of professional competencies.

The third stage of the study included testing, analysis and processing of experimental results; verifying of the effectiveness of the organizational and pedagogical conditions for the development of professional competencies in the individual work of students; generalization of the results obtained during the experiment; clarification of the research conclusions.

3. Discussion

The problem of students' individual work organizing has emerged not at present days, it has been discussed by many educator thinkers for centuries. In the writings of Ancient Greek scientists – Socrates, Plato, Aristotle it is mentioned about the importance of individual acquirement of knowledge. In the pedagogical works of I.G. Pestalozzi, Ya.A. Comenius, J.-J. Rousseau ideas associated with the individual development of children are considered. In different years of the twentieth century, teachers appealed to understanding of individual work, in the 20s–30s they tried to determine the essence of this concept. In the 1930s and 1940s, individual work was considered from the point of view of the didactic-methodological approach. In the 60s–80s scientific and technical revolution put school to the task of forming conscious creative activity and independence in the perception of students. By the beginning of the 21st century information and computer technologies had a favorable effect on the organization of learning and cognitive activity. A whole generation of training resources has emerged that operate on the basis of computer technologies, in addition, they generate a higher return from education. This has required increase of the amount of students' individual work, and also it induced to look for the ways of improving the quality of individual work, which relates to the basic forms of the educational process organization.

The concept of "individual work" is revealed in the works of many researchers. Individual work is considered as an activity; includes the search for necessary information, the acquisition and use of knowledge; it is conducted by the student independently without direct participation of the teacher (Gomoyunov, 1988); acts as a system of organization of pedagogical conditions that ensure the management of learning activities in the absence of a teacher (Graf et al., 1981); supposes the performing of various tasks, which are a means of mastering knowledge and forming creative skills and abilities; supposes the creation of problematic situations in the form of cognitive tasks (Pidkasistiy, Korotyaev, 1985).

The competency-based approach at the present time of the society development, being an advanced model of education determines a set of competencies and competences representing the body of knowledge, skills, experience, work methods. The competency based model was reflected in pedagogical researches of many scientists.

There is a theory of language competence, which means "catholicity of linguistic knowledge of the native language" (Chomsky, 1965). Competencies can be filled with personal components, such as motivation; consist of a large number of relatively independent from each other components (Raven, 1984); cause difficulties in measuring and evaluating them as a learning outcome (Zimniaya, 2003); in education it can designate integrated characteristics of the training quality (Shadrikov, 2004).

Competence is regarded as: the quality of a person who has got education at a certain stage and is ready for productive activity, considering its social importance and social risks associated with it (Tatur, 2004); possession of certain skills, knowledge, life experience that allow you to judge something, do something, or decide something (Shadrikov, 2004); substantial generalizations of empirical and theoretical knowledge, presented in the form of principles, concepts, sense-making matters (Zeer, 2006); possession of the relevant competence by a person, which includes personal attitude to the subject of activity and competence (Khutorskoi, 2005); integrated characteristics of personal qualities, the training of a graduate, contributing to the conducting activities in certain areas, expressed in the readiness for carrying out any activity in specific professional situations. Competence is a total of cognitive, motivational, value-based and social components (Frolov, Makhotin, 2004).

Despite a significant amount of researches and developments in the area of a competence approach implementation in vocational education, only some works to the problem of professional competencies development for engineering specialities in technical universities are devoted. The possibilities of individual work in this area remain insufficiently investigated. One should note the inadequacy of the development of theoretical and methodological foundations that ensure large-scale implementation of a competency-based approach into engineering degree.

4. Results
4.1. Theoretical basis of the development of students' professional competencies
In our research, competence represents an ability to apply knowledge and skills for successful activities in a certain field, an ability to perform labor functions, the conformity of a professional with the requirements for a definite occupation.

The concept of "professional competence" can be presented as an opportunity to acquire new knowledge, skills, abilities, powers; the possibility of effective use of abilities in the course of professional activities; as well as integration in the field of expertise, knowledge and skills, the presence of personal qualities.

Based on the researches (Dyachenko, Kandybovich, 1976), the criterial structure of professional competencies development, consisting of cognitive, operational-effective, motivational-value and reflective-evaluative criterion was determined and proposed. The basis of the motivational-value criterion is the system of the student's motivational value-based attitude toward himself and his activity. He describes the student's need for research, cognitive activity, the need for self-expression in the process of cognition, decision-making and evaluation. The cognitive criterion is the system of knowledge that works towards development of students' scientific world views. This criterion forms methodological skills at students, allowing the student to organize individual cognitive activity. The operational-effective one is manifested in qualities necessary for comprehension of individual activity goal, creativity, as well as for the vision of the problem, the posing of questions, the hypothesis, the ability to structure the material. Reflective-evaluative criterion is a cognitive attitude of students to learning outcomes, an ability to evaluate results, mistakes of his own and other students' activity, an ability to self-regulation.

For the motivational-value criterion the level of interest to the developed profession is the developmental quotient. The level of lessons learned is the developmental quotient of the cognitive criterion, and the level of individual cognitive activity is the quotient of an operationally effective criterion. The reflective-evaluative criterion is characterized by the degree of adequate evaluation of the results of competence development. Each criterion is represented by three indicators: low, medium and high.

The development of professional competencies in the individual work in our research was actualized on the interrelation of the basic principles of system, competency based, learner-centred and activity-based approaches.

The learner-centred approach lays the groundwork for the formation of a student as an actor able to realize his life-sustaining activity and his personal essence in the educational process and in the future professional activity. The implementation of the learner-centred approach takes place in conditions of individual identification and awareness of the means and conditions of the students' activity, ensuring their subjective position in the teaching and educational process, building the relational system between the teacher and students on the basis of frankness, trust, dialogue. The effectiveness of the educational process depends on the involvement of students into active learning activity, as a person develops and presents himself in activity. By organizing the students' activity, the teacher develops students' social and professional work experience, functions and abilities.

The main conceptual situations of methodological approaches became the basis for the realization of organizational and pedagogical conditions: the creation of subject-to-subject relations, the use of differentiated prolonged tasks, and the monitoring of the educational process (Guseynova, 2015).

In our study, subject-subject relations represent the business relationships of equal partners in joint working, which are built on the basis of support, trust and cooperation. Students, being the subjects of learning and cognitive activity, should know how this activity is carried out, they should have the potential for searching and making independent creative decisions, for unveiling their creative abilities. Dialogue is one of the most effective ways of subject-subject interaction, reflecting the transition of pedagogical interaction to a personal level.

The effective formation of subject-subject relations is influenced by the subjective characteristics of teachers: an ability to build relationships based on the dialogue, the presence of professional and pedagogical knowledge and skills, the presence of personal qualities, the focus on mutual understanding and mutual trust.

The prolonged tasks in our study are represented by professional, differentiated tasks of a long-lasting nature, which are carried out in stages, on the basis of their gradual complication in the process of studying the student course. The students organize the order of task performance with their gradual complication in the process of studying the student course from adaptive to developing and creative.

The third pedagogical condition for the development of professional competencies is the monitoring of the educational process, which represents a regular and systematized procedure of the accumulation, storage, processing and dissemination of information about the educational system. Monitoring enables the educational process to be followed and corrected timely and it becomes directed.

4.2. Experimental work on development of professional competencies of students in the individual work

At the ascertaining stage of the experiment, factors and conditions that influence the development level of professional competencies were revealed.

There was defined a set of professional competencies in the discipline «Hydraulics and fluid mechanics», the development of which was supposed to be obtained at students.

In the discipline «Hydraulics and fluid mechanics» it is supposed to have lectures, practicals, lab practicals as well as the performance of homework calculation tasks. The organization of individual work is provided during all types of classes.

At the ascertaining stage of the experiment a questionnaire was conducted among intramural (173) and extramural (48) students for identifying the level of students' motivation to study at the university, which showed that the students have insufficient level of internal motivation for learning activity. The survey was conducted in eleven study groups of second and third year of the branch. In general, extramural students show a higher percentage of internal motivation.

At the ascertaining stage of the experiment, we conducted a survey to determine the formedness index of locus of (direction) control of students. The survey conducted among the third-year-students in the Branch of Ufa State Petroleum Technological University in the City of Oktyabrsky showed that all interviewed students have an average level of subject control development. This index corresponds to the fact that students can take responsibility, and they also can charge with other people, declining all responsibility for what is happening.

At the forming stage of the pedagogical experiment, a set of organizational and pedagogical conditions for the development of professional competencies was realized. In the early stages of the competence development process, according to the requirements of educational state standards, the most important professional competencies were determined. Then the forming experiment was arranged in the following order: pedagogical technologies directed to the competence development were used; an educational environment was formed in which students and teachers were equal subjects of the educational process; the educational process was monitored.

Students of the training program 131000 «Petroleum Engineering», an educational program specialization «Operation and Maintenance of Oil Production Facilities» took part in the experiment. At the premises of the testing site for conducting the experiment and for testing the hypothesis, two groups of students were formed: control and experimental. While creating samples, the strategy of attracting real groups of students was applied. The selected student groups were homogeneous in composition. The group BGR-11-11 took on the role of experimental group (23 students), and the group BGR-11-12 – of control one (21 students).

In the experimental and control groups of students, a testing was conducted aimed to identify the initial level of training, which did not reveal any significant differences in the training of students. The measurement was carried out within the framework of the "Theory of Latent Variables" on the basis of the Rush model.

The basis for the motivation and value criterion for the development of professional competencies is the motivation for learning activity, manifested in its interest. In the control and experimental groups of students there was conducted a questionnaire, aimed at identifying the direction and level of the internal motivation development of students' learning activities. In the control and experimental groups, a questionnaire was conducted using the Dubovitskaya technique, aimed at identifying the direction and level of development of the internal motivation of students' learning activities. At the initial stage of the experiment, a low level of motivation in the control group was observed in 19 % of students, the average in 57 %, and a high level of motivation showed 24 %. In the experimental group, a low level of motivation was noted in 22 % of respondents, an average in 65.2 %, a high level in 12.8 %.

At the next stage of professional competencies development in the students' individual work, it was supposed to organize the teacher's activity on the basis of previously selected educational technologies, approaches and methods.

We proposed to increase the effectiveness of the professional competencies development in the individual work of technical university students by the organization of pedagogical conditions promoting to maximum display of students' independence.

We used the following pedagogical methods, tools and organizational forms of training: the use of prolonged tasks and problems associated with specific workplace problems; the mainstreaming used during lecture reading (keeping the log-books); the students' research work during the preparation of reports for conferences; individual work in small groups during lab practicals.

In the implementation of first organizational and pedagogical condition – the creation of subject-subject relations between the teacher and students – we cultivated sincerity and authenticity in communication, finick, benevolence, tact and pointed to the creation of equal relations. The development of students' subjective position was facilitated by their involvement in various activities, the enabling of free choice capability of educational activity elements. In the course of experimental work, to the development of students' abilities to put up the goals of the forthcoming activity was paid much attention as well as to the independent achievement of their objectives. In the course of the experiment, the teacher is keen to develop at students the communicative and reflexive skills. The students were given the opportunity to ask, perceive, comprehend the necessary information, also they gained reasoning experience, arguing experience and the experience for defending their point of view. The dialogic communication promotes more conscious creative acquisition of the material, provides a supportive environment in the classroom, develops equitable and open relations.

The usage of point rating system at students promotes the increasing of motivational level, allowing to monitor the quality of the knowledge and skills acquisition by the students, in particular inducing the latter to performing the tasks properly, to reducing timely performance, to the pursuance of creativity. For its successful implementation the individual schedule of individual work was drawn up, in which different types of work, the meeting deadline and the points given for

it were reflected. The problem of motivation was solved during the performance of the tasks, the doing of which gave the opportunity for students to see the results of their activities clearly. Also, pedagogical impact with motivation and encouragement contributed to the increase of the motivational level. In the course of the work, the teacher gave additional points to the students for displaying an active attitude on their own initiative and for perfect performance of the tasks. Charitable conditions were created for less advanced students, additional time for pondering a solution of the tasks was given. At the same time, a system of penalty points was used for the late performance of the tasks and for substandard quality of performance. Some students received additional tasks. Personal individualization of the tasks was widely encouraged.

In the course of the formative experiment we managed to discover new aspects of individual work conducting at the lectures. The originality of our approach during this part of the experimental work consisted of that we had changed the role functions of the subjects of the educational process.

During the lectures, the students of the control group had the opportunity to prove themselves as lecturers, that promoted the formation of search skills and information processing skills, the mastering of new interaction technologies between the group and information delivery methods with the developing public speech and listening skills, the communicative culture of students was developed.

The application of the «Log-book» strategy makes possible to have the dialogue between the lecturer and students. The students were given the opportunity to work out the learning material during the lecture in an active form.

The use of the individual work in small groups during the lab practicals contributed to the creation of conditions for self-development and self-realization, to the formation of cooperative relationship while searching for ultimate solution to the problem.

The realization of the second pedagogical condition which is the use of the prolonged tasks took place during the practicals. In our research, developing variative types of differential prolonged tasks for individual work, providing for the gradual complication of tasks, we looked out of the following types of tasks: adaptive, developing and creative. The students chose the appropriate level of tasks themselves. The individual work was conducted during the in-class learning. The students received bonus points for their active work.

The third pedagogical condition for the development of professional competencies in the students' individual work is the monitoring of the learning process. Monitoring promotes the development of the addiction to systematic task performing. We conducted a current and a final control. «The schedule for students' individual work» was developed in the discipline, which reflects the main "working points" of the discipline, according to which the points are scored within the frame of the point rating system. Additional monitoring was conducted during lectures, practicals and lab practicals.

The comprehensive realization of the organizational and pedagogical conditions for the development of professional competencies in the students' individual work made it possible to conclude that the technical university has the potential for the training of specialists capable of functioning in the constantly developing professional environment.

During the formative experiment, the students were able to develop communicative skills while working in small groups in practicals and laboratory practicals, creative skills in choosing the ways of performing the work, the skills to acquire knowledge independently, to use the basic laws of science disciplines in professional activities, to plan and conduct experimental activities.

At the final stage of the formative experiment on the professional competencies development in the students' individual work, analytical, corrective actions of pedagogical activities were carried out. A comparative analysis of the results obtained in the experimental and control groups of students was carried out based on the criterial apparatus for the development of professional competencies developed initially.

Table 1 presents comparative analysis of the level of cognitive criteria development in the control and experimental groups of students' preparedness during the semester.

Table 1. A comparative analysis of the level of students' preparedness

Group	Time	Average value	Standard error	Low level	High level
BGR-11-11	1	1,786	0,201	1,387	2,185
	2	2,443	0,201	2,044	2,842
BGR-11-12	1	1,561	0,210	1,144	1,979
	2	1,694	0,210	1,267	2,122

Table 2 presents the criteria for development of professional competencies in the control and experimental groups at the end of the experimental work.

Table 2. Levels of professional competencies development at the end of experimental work

Groups	Components	Levels of professional competencies development					
		Low		Average		High	
		man	%	man	%	man	%
EG	Cognitive	1	4,3	5	21,7	17	74
	Motivational value	2	8,7	13	56,5	8	34,8
	Operational-effective	1	4,3	9	39,2	13	56,5
	Reflective-evaluative	1	4,3	13	56,5	9	39,2
	Professional competencies	1	4,3	10	43,5	11	52,2
KG	Cognitive	5	23,8	8	38,1	8	38,1
	Motivational value	2	9,5	15	71,4	4	19,1
	Operational-effective	4	19,1	11	52,4	6	28,5
	Reflective-evaluative	3	14,3	13	61,9	5	23,8
	Professional competencies	3	14,3	12	57,1	6	28,5

A comparison of the results of the implementation of organizational and pedagogical conditions showed that the experimental group had experienced a greater increase in the level of professional competencies development. In the experimental group, the number of undeveloped students decreased by 13.1 %, and the group with a high level increased by 30.5 %. In the control group, these figures are lower, a decrease by 4.7 %, and an increase by 4.5 %.

To assess the effectiveness of the experimental impact, statistical processing was carried out on the basis of nonparametric methods. Based on the results of the calculation of Mann-Whitney U, a conclusion was made about the criterion for the reliability of the difference between groups ($p \leq 0.05$), which was subsequently confirmed by calculation of φ^*-the criterion o of the Fisher angular transformation. Critical values of φ^* were obtained for two levels of statistical significance 1.64 ($p \leq 0 .05$) and 2.31 ($p \leq 0.01$). The calculated empirical values φ^* for the transition from a low level of development of professional competencies to the average level (3.062) and at the transition from the middle level to the high level (2.509) are greater than the critical values, which was confirmed by the effect studied.

The value of Chi-square $\chi 2$ calculated for each component of professional competence in the experimental and control groups, with statistical significance level $p \leq 0.05$ was higher than the critical value. For cognitive and operationally-effective criteria obtained value of $\chi 2$ was higher than the critical values at the significance level $p \leq 0.01$. The obtained results also confirmed the investigated effect.

5. Conclusion

The experimental work on the development of professional competencies has made an impact on the effectiveness of the formation of a competent specialist ready to work in a professional environment.

The information of the article can be recommended to teachers of higher and secondary educational institutions to ensure the development of professional competencies in the individual work of students and to optimize the work of higher vocational training institutions for improving the quality of education.

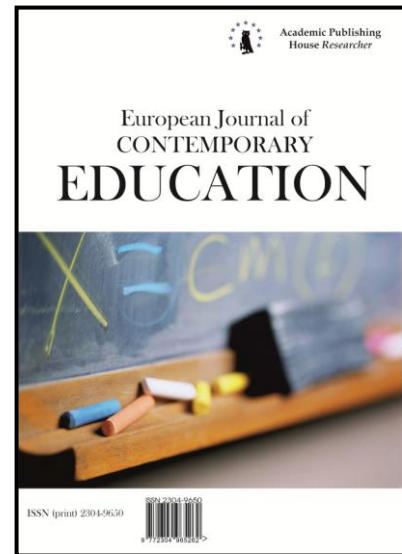The study does not pretend to have exhaustive results on this subject and can be continued.

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**Effects of a 7-month Exercise Intervention Programme
on the Psychosocial Adjustment and Decrease of Anxiety Among Adolescents**

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Abstract
This study investigated the psychosocial adjustment and anxiety of adolescents during a 7-month exercise intervention programme. In addition, extensive research on the psychosocial adjustment of adolescents during intense physical activity was performed. The experimental group included adolescent girls (n=110) and boys (n=107) aged between 14 and 15 years while the control group included adolescent girls (n=99) and boys (n=112) of the same age group attending the same school. The girls and boys in the EG participated in modified physical education lessons two times a week. Once a month they received a theory class where they were taught about communication disorders of adolescents and ways of preventing them by means of physical activities. In practical classes, the girls and boys in the EG had sports and games (basketball, volleyball and football) as well as Pilates, enhancing physical abilities. The measurement of psychosocial adjustment included the modification method developed by Roger and Daimond. The measurement of anxiety, the methodology of Reynolds and Richmond. In summarising the results of the 7-month exercise intervention programme of enhancing psychosocial adjustment and its components (self-esteem, dominance, positive self-evaluation, emotional comfort, internality, and evaluation by others) and decrease in anxiety in physical education lessons, we can state that after the intervention there are certain tendencies towards improved psychosocial adjustment that assists in overcoming various critical situations.

Keywords: physical activity, psychosocial adjustment, anxiety, adolescent.

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1. Introduction

The positive effect of exercise intervention programme, physical activity (PA) on psychosocial adjustment and anxiety is a widely held and accepted belief among scholars and practitioners alike (Paluska, Schwenk, 2000). Several cross-sectional studies have supported the association between physical self-perception and self-reported levels of exercise (Fox, 2000). Although evidence of the positive effects of exercise and exercise training on depression and anxiety is growing, the clinical use-at least as an adjunct to established treatment approaches like psychotherapy-is still in its infancy (Strohle, 2009).

Although the many physical and psychological health benefits of PA are commonly recognised, participation in PA declines among girls and boys during adolescence with dramatic decreases shown for girls between the ages of 12 to 15 years (Nader et al., 2008). Regular PA during adolescence as well as leading an active lifestyle is associated with several physical and psychological benefits (Janz et al., 2006) including the likelihood of reducing health problems such as hypertension, osteoporosis, and the incidence of chronic diseases, including coronary heart disease and diabetes in later life (Warburton et al., 2006). PA and the positive effects of exercise are also associated with enhanced psychosocial adjustment (Klizas et al., 2012) and improved self-esteem and self-identity among adolescent girls (Fitzgerald et al., 2012). Adolescents' physical and socio-emotional competencies are developed through engagement in team sports with their peers as well as other physical and leisure activities (Salvy et al., 2008). Peer relationships and friendships developed through PA offer important opportunities for companionship, support and recreation. Peer victimisation and social isolation, on the other hand, may impose constraints on access to PA (Storch et al., 2006). Considering the potential role that peer and/or friend influences may have on adolescents' PA, further comprehensive understanding and synthesis of research carried out in this area is required (Fitzgerald et al., 2012). It has been established that PA has a significant impact on the psychosocial adjustment of adolescents. Psychosocial adjustment during adolescence may be interpreted as the striving of adolescents to discover their place and to alter it in order to adapt it to themselves. A review by Goldfield et al. (2011) indicated that effect of intensity of PA and psychological distress was observed whereby those who performed greater bouts of PA exhibited better psychosocial adjustment than adolescents engaging in mild to moderate intensity activity. Gender impacted the results as PA was associated with reduced depression but not anxiety in boys, and reduced anxiety but not depression in girls. The positive association between total volume of PA and psychological functioning in the overall sample was no longer significant when gender was considered, except for reduced anxiety in girls. However, most previous works have evaluated overall PA and not structured activity, which may have a different set of predictors. Total PA is a combination of structured (e.g. physical education classes, organised sports and activity lessons) and unstructured PA. Since many PA interventions for this age group are structured in nature, it is important to understand the correlates of structured physical activity.

It should be pointed out that adolescent health disorders and their psychosomatic troubles are on the increase with students complaining about different pains and sleep disorders. There is a general belief that physical activity and exercise have positive effects on anxiety and a great number of studies describe an association between physical activity and anxiety (Strohle, 2009). Klizas (2009) points to the most frequent difficulties of adolescents' psychosocial adjustment which include general anxiety that expresses the emotional state related to their entire school-life; experience of social stress due to interpersonal relationships with peers; fear of self-expression when negative emotions hinder exposure of oneself and one's abilities; the fear that their own results will not meet the expectations of others; and the emerging anxiety as a consequence of negative evaluations. A significant feature in the school context is the adolescent-teacher relationship, due to the essential role teachers play in the academic performance and psychosocial adjustment of adolescents in the classroom (Koth et al., 2008; Estévez et al., 2014). Anxiety has been identified as a potential barrier to physical exercise due to concerns over revealing one's physique to others despite the incentive that taking part in exercise is a means of decreasing anxiety through the development of a fitter and more attractive physique (Hausenblas et al., 2004). Intervention studies over five months (McAuley et al., 1995), ten weeks (Bartlewski et al., 1996), and six weeks (Williams, Cash, 2001) have demonstrated that exercise and circuit training may effectively reduce anxiety.

The aim of the study was to establish the effects of a 7-month exercise intervention programme on the psychosocial adjustment and decrease of anxiety among adolescent girls and boys.

Purpose of the research

Our study is the first time that an extensive investigation into the peculiarities of the components influencing the psychosocial adjustment and decrease of anxiety in adolescents during a 7-month exercise intervention programme has been recorded. In addition, extensive research on the psychosocial adjustment of students during intense PA was performed. In this research, the attitude of students towards the psychosocial adjustment expressed in scholarly sources was confirmed. The selected components of the construct of psychosocial adjustment: self-esteem, dominance, positive self-evaluation, emotional comfort, internality, and evaluation by others, revealed the novelty of this research as no literature was found dealing with the impact of a 7-month exercise intervention programme on the alteration of indices of the psychosocial adjustment of students of this age group.

2. Materials and Methods

Ethical considerations

The research protocol was discussed with and approved by the Kaunas Regional Biomedical Research Ethics Committee (Report Number BE-2-24). Before the investigation began, each subject read and signed a written informed consent form, and the study protocol was consistent with the principles outlined in the Declaration of Helsinki.

Research design

In the present research, a pre-test/post-test experimental design was used. This design was chosen because experimental design can encumber educational activities due to the random selection into groups. The experimental group was provided with 7-month exercise intervention programme aimed to strengthen psychosocial adaptation-related behaviours of adolescent girls and boys during physical education lessons. On the other hand, the control group was not provided with any treatment (girls and boys in the control group attended physical education lessons which were not modified). Each subjects read and signed a written informed consent form, we informed consent from the parents/guardians of the adolescents (below 16 years) involved in the study.

Participants

The participants consisted of non-physically active adolescent boys and girls. The adolescent students of both genders were selected for the experiment by applying a two-stage sampling strategy. First, the school was randomly selected from secondary schools (in Lithuania). Next, all students from eighth and ninth forms were tested (every second form was experimental). The experimental group (EG) included 14–15-year-old adolescent girls (n=110) and boys (n=107), and the control group (CG) included adolescent girls (n=99) and boys (n=112) from the same age group attending the same school. The age of the participants ranged from 14.7 ± 0.51 EG and CG groups. Mean weight, height, and BMI at pretest for girls in the EG and CG groups were 54,3±12 (kg), 1.65±11 (m), and 20,1±1,72 (kg/m²); and for boys in both groups, 59,3±11 (kg), 1.76±14 (m) and 19,6±2,41 (kg/m²) respectively.

Instruments

Two questionnaires, namely the Rogers and Dymond's (1954) questionnaire (Klizas et al., 2012) and Reynolds and Richmond's Anxiety Scale (1994), were used. The Rogers and Dymond's questionnaire was chosen for the evaluation of psychosocial adjustment (Klizas et al., 2012) and had been translated into Lithuanian and validated in early studies with Lithuanian adolescents (Klizas, 2009). This questionnaire consists of 101 items with psychosocial adjustment rated on a 7-point scale. The respondents were asked to choose one answer out of the seven possible variants:

'This is definitely not about me,' = a score of 0;
'This does not look like me,' = a score of 1;
'I doubt that this could be applied to me,' = a score of 2;
'I do not dare to apply it to me,' = a score of 3;
'This is similar to me, but I am not sure,' = a score of 4;
'This is similar to me,' = a score of 5; and
'This is definitely about me,' = a score of 6.

The main subscale that best reveals the nature of psychosocial adjustment is an adjustment subscale (the internal validity of this subscale [Cronbach α] was 0.76). The subscale includes 67 items of the questionnaire. Besides the psychosocial adjustment subscale, other subscales (self-esteem, dominance, emotional comfort, internality and evaluation by others) were analyzed as well, which helped reveal the individual's psychosocial adjustment. The self-esteem subscale consisted of 18 items. Cronbach α of the self-esteem subscale was 0.72 for the present sample. The subscale 'dominance' consisted of nine items with a Cronbach α of 0.72 for the present sample.

In order to evaluate adolescent girls' and boys' anxiety, the methodology of Reynolds and Richmond (1994) was used (Dewaraja et al. 2006; Klizas, 2009). The Revised Children's Manifest Anxiety Scale (RCMAS) contains 37 items with 28 items used to measure anxiety and an additional nine items that present an index of the child's level of defensiveness. For our study, we were only concerned with the factor analysis of anxiety; therefore, only those 28 items used to measure anxiety were used in this factorial analysis. The RCMAS consists of three factors, 1) somatic anxiety consisting of 12 items, 2) personality anxiety consisting of eight items, and 3) social anxiety consisting of eight items.

The results are estimated as follows: 1) somatic anxiety (up to 6.0 points – high somatic level, from 5.9 to 4.5 points – average somatic level, from 4.4 to 1.0 point – low somatic level); 2) personality anxiety (from 2.0 to 2.5 points – low personality anxiety level, from 2.6 to 3.5 points – average personality anxiety level, from 3.6 to 4.5 points – high personality anxiety level); and 3) social anxiety (to 5.5 points – high social anxiety level, from 5.4 to 4.5 points – average social anxiety level, from 4.4 to 3.3 points – low social anxiety level). Cronbach's alpha coefficient for subscales ranged from 0.72–0.73

Procedure

Both adolescent girls and boys in the CG attended physical education lessons which were not modified and took place twice a week (Klizas, 2009; Klizas et al., 2012). The girls and boys in the EG participated in modified physical education lessons two times a week. Once a month they received a theory class where they were taught about communication disorders of adolescents and ways of preventing them by means of physical activities. In practical classes, the girls and boys in the EG had sports and games (basketball, volleyball and football) as well as Pilates, enhancing physical abilities (Klizas, 2009; Klizas et al., 2012). The exercise intervention programme aimed to strengthen psychosocial adaptation-related behaviours of adolescent girls and boys during physical education lessons and adaptation of personality psychological features of this age group.

Adolescent girls and boys in both the experimental and control groups filled in questionnaires in the presence of a teacher and researcher (who monitored the course work and instructed the respondents). The survey lasted 30–35 minutes. Physical education lessons for both groups (experimental and control) were conducted by the same teacher, the author of this research. The study followed the principles of prior informed consent and voluntary participation. Hence the aim of the research was explained to the students and those who refused to participate were able to leave the study. The adolescents were also informed about the anonymity of the research.

The study was carried out in several stages. The adolescents in both EG and CG underwent initial testing of their psychosocial adjustment (baseline measurements) after which the girls and boys in the EG experienced experimental impact (7-month exercise intervention programme of enhancing psychosocial adjustment in the lessons of physical education). After the experiment all subjects in both EG and CG were tested again.

Statistical analysis

Data analysis was performed using the Statistical Package for Social Sciences (SPSS) version 21. Descriptive statistics (M, SD and SEM) were calculated. Teams were compared by means of a one-way Analysis of Variance (ANOVA), followed by the Least-Significant-Difference *post hoc* procedure. Statistical significance was set at p≤0.05.

3. Findings

Table 1 reports the between-group (EG and CG) comparisons for psychosocial adjustment before pretest and post-test. Fig. 1 illustrates the differences between the respective groups.

The results of the alteration of the levels of the psychosocial adjustment of the adolescents (girls and boys) in the experimental and control groups were compared before and after the

intervention programme. Before the experiment (pretest), there was no significant difference in the score of the psychosocial adjustment scale comparing both the groups EG and CG (54.74±9.85 vs. 55.11±9.27; F=0.174; p>0.05; P=0.065). The analysis of the data demonstrated that when comparing the psychosocial adjustment of the adolescents (girls and boys) in the experimental group pretest and post-test, a significant difference in the psychosocial adjustment score was observed (54.74±9.85 vs. 59.69±11.20; F=21.99; p<0.05; P=0.792), although this cannot be said about the results of the psychosocial adjustment in the control group (Fig. 1a).

Analysis of the self-esteem scale showed that the results of the experimental and control groups before the intervention programme were similar: there was no significant difference in the score comparing the experimental and control groups (59.04±11.76 vs. 59.55±11.00; F=1.768; p>0.05; P=0.258). Post-test showed that the results of the experimental group after the intervention programme changed significantly in comparison with those before the experiment (59.04±11.76 vs. 64.65±12.45; F=13.715; p<0.05; P=0.884) (Fig. 1b).

Fig. 1c shows that evaluation by others of the adolescent pretest showed there was no significant difference in the score comparing both the groups EG and CG (53.61±11.25 vs. 54.25±11.32; F=0.428; p>0.05; P=0.095). The analysis of the data demonstrated that when comparing the evaluation by others of the adolescents (girls and boys) in the experimental group pre-test and post-test, there was a significant difference (53.61±11.25 vs. 58.89±15.87; F=56.081; p<0.05; P=1.000), although this cannot be said about the results of the evaluation by others in the control group.

a

b

c

d

e   f
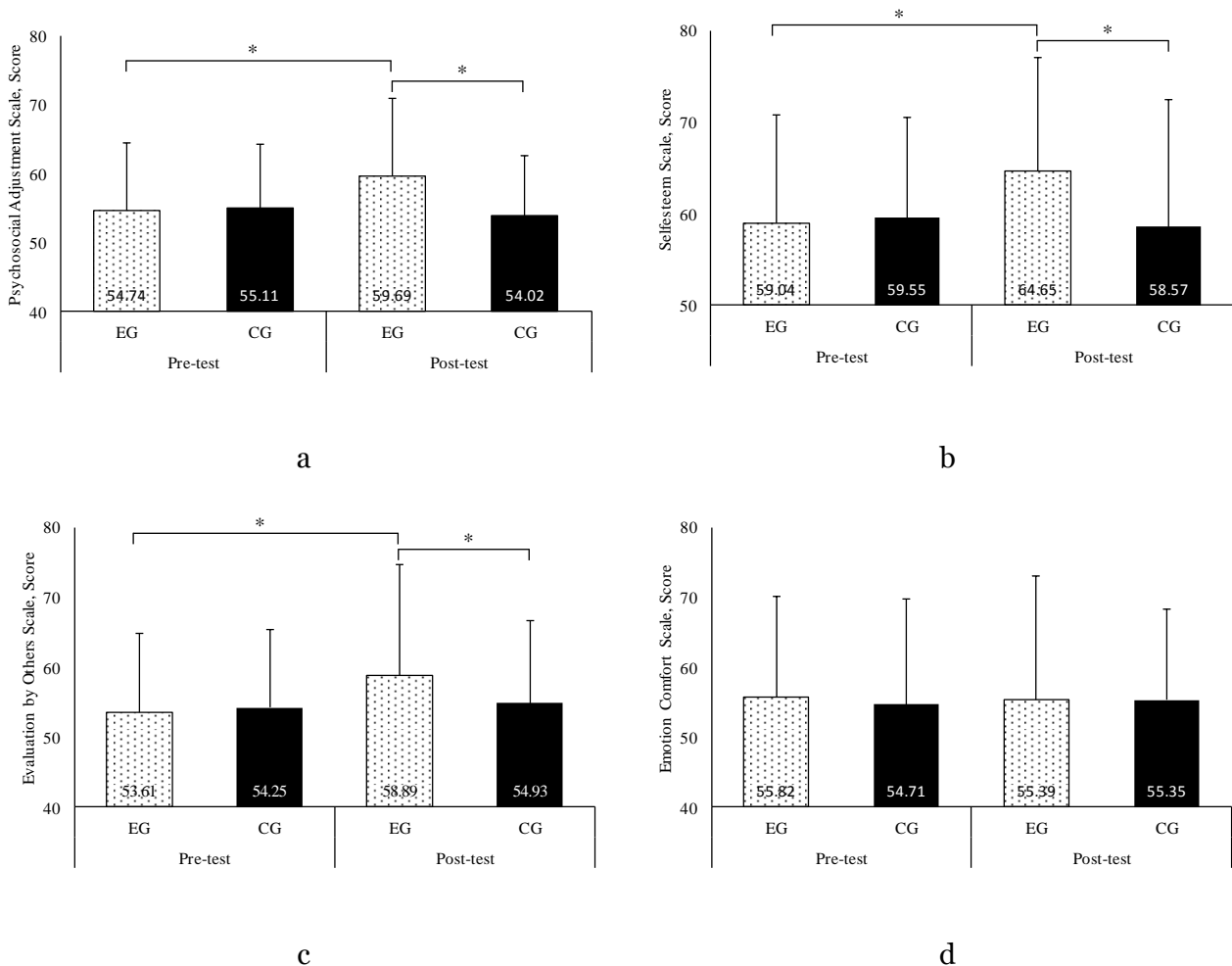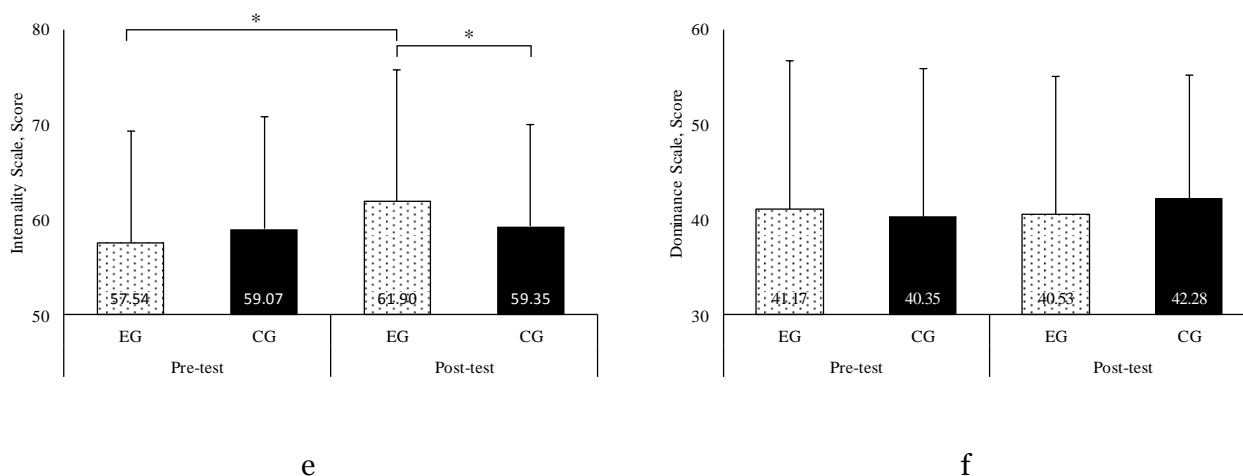
* Significal difference (p<0.05)

Fig. 1. The level of adolescents' psychosocial adjustment: (a) self-esteem, (b) evaluation by others, (c) emotional comfort, (d) internality, (e) dominance, (f) at pre-test and post-test.

Analysis of the emotional comfort scale showed that the results of the experimental and control groups before the intervention programme were similar: there was no significant difference in the score comparing the experimental and control groups (55.82 ± 14.27 vs. 54.71 ± 15.02; $F=0.616$; $p>0.05$; $P=0.118$). Post-test showed that the results of the experimental group after the intervention programme changed significantly in comparison with those before the experiment (55.82 ± 14.27 vs. 55.39 ± 17.79; $F=0.228$; $p>0.05$; $P=0.072$) (Fig. 1d).

Figure 1e shows that internality of the adolescent pre-test showed there was no significant difference in the score comparing both groups EG and CG (57.54 ± 11.84 vs. 59.07 ± 11.83; $F=2.099$; $p>0.05$; $P=0.298$). The analysis of the data demonstrated that when comparing the internality of the adolescents (girls and boys) in the experimental group pre-test and post-test, there was no significant difference (57.54 ± 11.84 vs. 61.90 ± 13.91; $F=11.896$; $p>0.05$; $P=0.884$).

Figure 1f shows that dominance of the adolescents' pretest no significant difference in the score comparing both the groups EG and CG (41.17 ± 15.61 vs. 40.53 ± 14.57; $F=7.955$; $p>0.05$; $P=0.070$). The analysis of the data demonstrated that when comparing the dominance of the adolescents (girls and boys) in the experimental group pretest and post-test, there was no significant difference (41.17 ± 15.61 vs. 40.35 ± 15.53; $F=0.313$; $p>0.05$; $P=0.082$).

The research performed at the beginning of the experiment showed that at pre-test, the level of somatic anxiety of the adolescents in CG (girls and boys) was average (4.55 ± 1.18 points). When exploring the results of the somatic anxiety in EG (4.55 ± 1.18 points) before the experiment and after it, we established that after the intervention programme, a somatic anxiety in EG was established (4.18 ± 1.09 points). This demonstrates lower levels of depression, seclusion, somatic complaints, aggression and delinquent behaviour ($F=4.195$; $p<0.05$; $P=0.510$) (Fig. 2a).

When dealing with the results of the anxiety of personality, we established that pre-test and post-test, the results of CG students were not statistically significantly different (2.45 ± 0.73 points and 2.27 ± 0.73 points correspondingly) ($F=0.127$; $p>0.05$; $P=0.047$). When analysing EG personality anxiety results pre-test and post-test we established that after the intervention programme, EG personality anxiety results decreased (3.27 ± 1.00 points and 2.55 ± 0.82 points correspondingly) ($F=5.501$; $p<0.05$; $P=0.684$) (Fig. 2b).

At the pre-test the level of social anxiety CG showed was 4.09 ± 1.18 points. The post-test CG result was statistically significantly lower (3.82 ± 1.09 points) ($F=3.845$; $p<0.05$; $P=0.687$). When analysing the levels of the social anxiety of EG pre-test and post-test results decreased after the intervention programme (5.91 ± 1.00 points and 4.45 ± 1.27 points correspondingly) and were significantly different ($F=7.086$; $p<0.05$; $P=0.702$) (Fig. 2c).

a

b

c
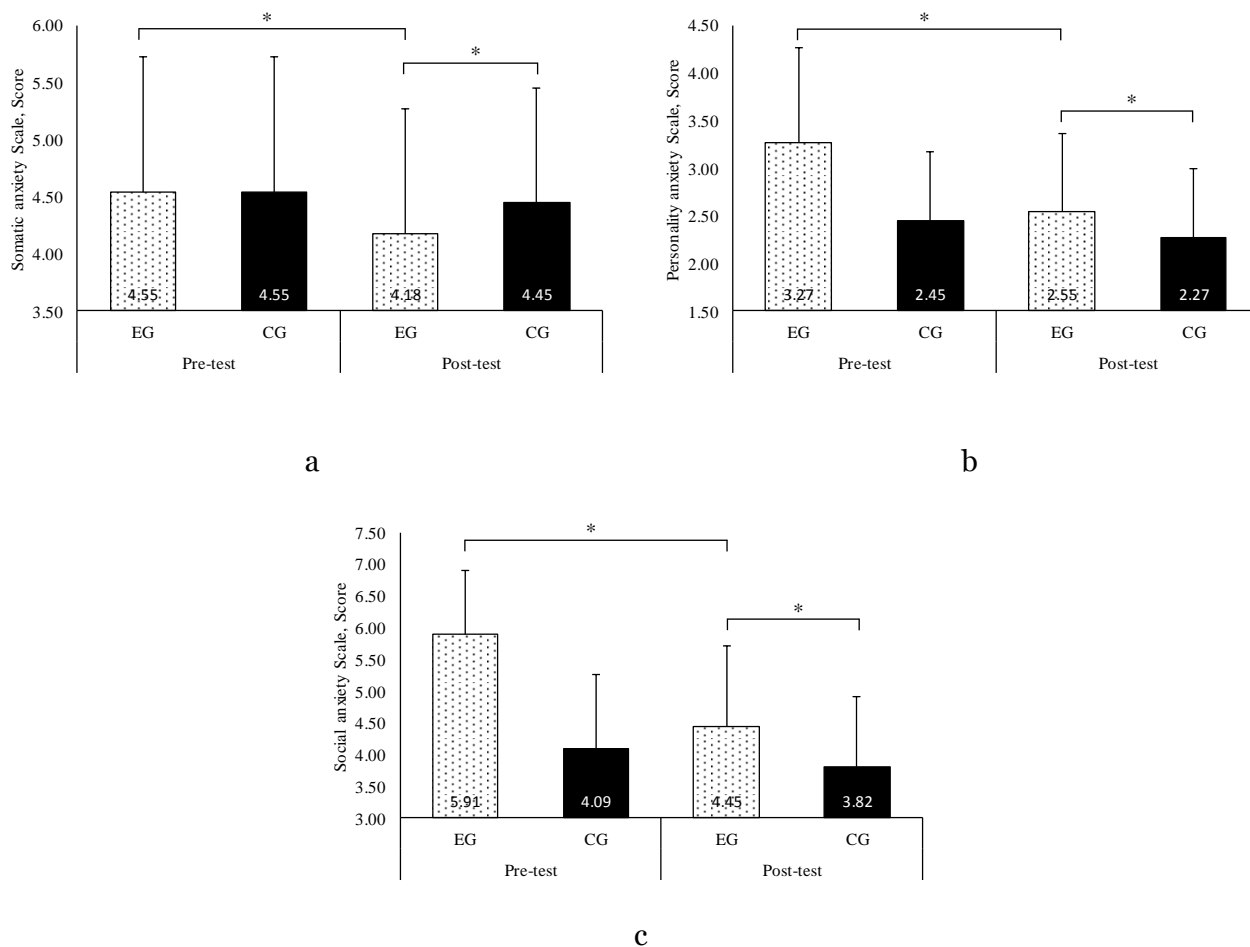
* Significal difference (p<0.05)

Fig. 2. The level of adolescents' somatic anxiety (a) personality anxiety, (b) social anxiety, (c) at pre-test and post-test.

4. Discussion

The purpose of this study was to establish the effects of a 7-month exercise intervention programme on the psychosocial adjustment and anxiety among adolescent girls and boys. It was established that psychosocial adjustment of adolescent girls and boys in the EG and the components of this construct (self-esteem, evaluation by others, emotional comfort, internality and dominance) were higher after the 7-month exercise intervention programme compared to those of the EG before the experiment, and those of the CG before and after the experiment. In accordance with the hypothesis, overall the results support the positive effects of a 7-month exercise intervention programme in enhancing psychosocial adjustment through the lessons of physical education on psychosocial adjustment and decrease of anxiety, with the EG showing a positive, or more positive, change in psychosocial adjustment, and a decrease of anxiety compared to the control group where the changes were less positive.

Moreover, these results corroborate some previous intervention studies, namely that PA and exercise have positive effects on the psychosocial adjustment of middle school-aged students. Due to multiple reasons, the lessons of physical education are an excellent opportunity to get children interested in intense physical activities (Malinauskas et al., 2008). Research shows that during physical education lessons, students strive for improvement and satisfaction in vigorous PA; thus, physical education acquires a pedagogical meaning and value (Bobrova, 2009). As physical education and exercise intervention programmes are linked to many personal qualities, such as morality, self-confidence, self-actualisation and self-esteem, it helps enhance psychosocial adjustment for school children (Klizas et al., 2012). After a 6-month exercise intervention

programme, researchers established that no significant improvement in physical self-perception profile subdomains, but lower social physique anxiety scale scores for the intervention group, compared to the control group. The changes in physical self-perception profile and social physique anxiety scale scores were not linked to changes in physiological variables (Lindwall, Lindgren, 2005). Regular exercise (a 12-week programme) was found to be an impacting variable in improving self-esteem and decreasing the hopelessness level of females (Yigiter, 2014). Klizas et al., (2012) established that after the educational experiment for adolescent girls, the index of the psychosocial adjustment in the EG improved statistically significantly as well as the values of the three structural components of the psychosocial adjustment: self-esteem, dominance and life satisfaction. Blauzdys & Vilkas (2007) carried out the pedagogical experiment in five third-form students in one gymnasium of Vilnius. For five months, 58 girls and 35 boys were analysed. At the beginning and the end of the experiment, the subjects were interviewed in writing, and their PA was fixed by five tests. Besides offering the usual physical education curriculum during lessons, four theoretical lessons were added and conducted at two forms of the experimental impact. During the first two lessons, the history and classification of basketball and volleyball were analysed, during the other two – of gymnastics sport branches – information on the educational mission of motions, their bio-mechanical structure, and the importance of social assignments was provided, as well as their benefit for students discussed. Scientists determined that after the pedagogical experiment some indicators of PA and exercise training improved, during the experimental period the need for information on the promotion of the students' health, emotional comfort and the formation of an attractive body increased statistically reliably ($p < 0.05$) (Blauzdys, Vilkas, 2007).

It should be noted that disorders of adolescents' health and their psychosomatic troubles continue to increase; students complain about different pains and sleep disorders. Anxiety disorders are one of the most common psychiatric disorders among children and adolescents (James et al., 2013). Point prevalence estimates of anxiety disorders suggest a prevalence of 2.27–4.55 %. Anxiety that occurs during childhood has a moderate-to- high impact on functioning and could lead to severe disability which, if left untreated, continues into early adulthood (Rapee et al., 2009). Having summarised the results of our 7-month exercise intervention programme on anxiety research, it is evident that, although the period of applied educational influence was relatively long, certain tendencies of the change in the adolescents' anxiety level were observed in the EG. At the beginning of the experiment, the performed research showed that the level of *somatic anxiety* of the EG students was average before the experiment. It was determined that 40.82 % of the group experienced average anxiety levels, while 31.54 % (i.e. every third child) experience high anxiety levels (Grigaitė et al., 2009). It was identified that the prevalence of somatic anxiety among students is characteristic from 10 to 23 % (Berntsson et al., 2001). According to Caciopo et al. (2006), who summarised the data of most adolescent researches, children of this age felt great stress related to unhappiness, fear of isolation, remoteness from parents and relatives as well as contemporaries, experiencing it as a sad state and rejection by contemporaries. Physical exercise appears to improve depressive symptoms in adolescents; higher methodological quality and lowered statistical heterogeneity suggests that exercise may be a useful treatment strategy for depression and anxiety (Carter et al., 2016).

5. Conclusions

It was established that the properly construed and purposefully applied complex of the 7-month exercise intervention programme of enhancing psychosocial adjustment and its components (self-esteem, evaluation by others, internality) caused the statistically significant changes in the dependent variables: increased psychosocial adjustment and decreased anxiety.

On a practical level, the findings have implications for the development and implementation of exercise intervention programmes for adolescents. The present study offered important information that can be used by educators, parents and policymakers to enhance psychosocial adjustment among adolescents because the findings suggest that existing exercise-based intervention programmes may have a positive influence on psychosocial adjustment and decrease anxiety. It would be worthwhile to implement exercise-based intervention not only on 14–15-year-old adolescents but also students of other age groups.
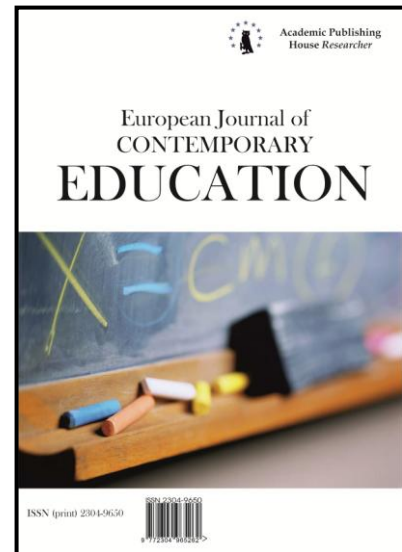
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The Realization of the System Programme "Health Saving Education" in the Pedagogical University

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Abstract

The purpose of the article is to develop a system programme "Health saving education" on the basis of creating a structural model and model of management and ensuring health and preventive activities and experimentally prove the effectiveness of its implementation in the educational process of the university. The solution of research problems was ensured by a set of complementary theoretical methods on the analysis of domestic and foreign pedagogical theory, practice and experience in the field of health of saving education and professional standards. And also general scientific methods such as classification, modeling, comparison, comparison and generalization; experimental methods with the involvement of diagnostic tools based on B. Bloom's classification in the author's modification and expert assessments. The research reveals and scientifically proves that the process of health of the saving education of future teachers in the aspect of implementing the author's system programme becomes more effective while ensuring the systemic nature of provision and management. The practical significance of the research is that using the author's programme will allow us to reach the highest quality level of professional training of teachers, which ensures health saving individual-differentiated development of the student. The proposed patterns, provisions and conclusions create the prerequisites for further study of the phenomenon of realization of the health of saving education in methodological, content and management aspects. The presented practical experience of realization of the programme "Health saving education" can be used at building of professional space, in other educational organizations.

Keywords: programme, health saving education, teacher training, model.

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1. Introduction

The preamble to the statutes of the World Health Organization states: "Health is a state of complete physical, mental and social well-being, and not only the absence of disease and physical defects." Health to a great extent depends on the relationship of man with the environment, society and production activities. Proceeding from this, it is possible to define health as well as the state of the human body (its physical and mental qualities), enabling it to actively live and work under various environmental conditions and to withstand its unfavorable factors.

At the present time, a new attitude to health is forming as the basic value of life activity. However, this process is in the making, and the attitude of Russians (including young people) to their own health is mainly instrumental in nature, serves as a means of realizing various goals (for example, getting a job).

According to theoretical studies, the situation with respect to the awareness of young people studying, about the most common diseases, methods of taking care of their health, the genetic characteristics of their bodies leaves much to be desired, since only one third of the citizens own this information. In various educational organizations, conditions are created to strengthen the health of students and schoolchildren, sanitary and hygienic education in the field of health culture and the formation of a stable need for a healthy lifestyle are realized, and active theoretical and practical measures are taken to prevent socially caused diseases. In this regard, one of the urgent problems in the field of training future teachers is the implementation of the educational process, using the health of saving technologies and preparing students for their subsequent use in school. In the scientific literature, the issues of introducing health technologies into the professional training of teachers have been thoroughly studied, namely:

- research on the theoretical and methodological justification of the process of forming the health of the saving competence of students using different innovations;

- creation of the currently required social and pedagogical conditions for the formation of a physically, intellectually and spiritually developed personality;

- solving the problems of insufficient response of the system of vocational education, the rapidly changing conditions of the life of the society in the aspect of meeting the health of the saving educational needs of modern students.

However, the development of a structured health-preventive environment of a pedagogical university has not been implemented to the present day. Therefore, the goal of the article is to develop a systematic program "Health saving education" in a pedagogical university on the basis of creating a structural and management model and experimentally prove the effectiveness of its implementation in the educational process.

2. Materials and methods

As a methodological substantiation of the author's research, a systematic approach is considered, the implementation of which, in conjunction with competency, activity, personality-oriented and culturological approaches, provides a higher quality level through the integration of various clusters, components and innovative technologies of health-saving education. The solution of research problems was provided by a set of complementary theoretical methods, on the analysis of domestic and foreign pedagogical theory, practice and experience in the field of health-saving education and professional standards; general scientific methods such as classification, modeling, comparison, comparison and generalization; experimental methods with the involvement of diagnostic tools based on B. Bloom's classification in the author's modification and expert assessments.

At the first stage of the 2560 students attending the Institute, a set of willing students was announced for experimental work. As a result, 186 students enrolled in day schools and those in correspondence courses expressed their desire to participate. In the second stage, out of 186 students, 96 students were identified who meet the following criteria:

- age of respondents – 18–25 years;

- on the characteristics of the level of health (basic or preparatory health group);

- on the level of educational training (who scored an average of 60–72 points for entrance examinations to the institute for 1 course of study).

Of the 96 students selected, 2 groups were formed: 46 students enrolled in day schools – the experimental group (EG) and 50 students of those in correspondence courses – control (CG). From all participants in the experiment, informed consent was obtained to participate in this study.

During 2011–2016 years we conducted research work in the Glazov State Pedagogical Institute. In the experimental group (EG), the program "Health Savings Education" was implemented during the three academic years (2012/13, 2013/14, 2014/15). In the control group, during the same years, health-preventive and health-saving activities were implemented, but not according to the author's program.

Based on experimental methods involving diagnostic tools, a criterial-level research apparatus was determined. Three main indicators of quantitative and qualitative assessment were determined on three levels (high, average, low): educational, health and upbringing (Table 1).

Table 1. Criterial-level research apparatus

Low	Average	High
Upbringing indicator		
Purpose: to determine the presence of a culture-oriented belief, the need for a physical and healthy image and lifestyle. Method: the author's method of determining the physical culture and health outlook on the analysis of data in the social network "In contact". Contents of the diagnostic: the respondent needs to answer 14 questions: 1. Is (there) present at you physical culture and health topics in the "status" on your page. 2. The presence of photographs and videos (your personal) on the physical culture and health topics on your page. 3. The presence of photographs and videos on the physical culture and health topics on your page 4. Is there (was present) you have physical culture and health in the "lichke" on your page. 5. Is there (was present) whether you have a health and fitness theme "on the wall" and in the "news" on your page. 6. Do you leave the health information on other pages (bookmarks, meetings, applications, subscriptions, etc.). 7. Do you leave comments on the physical culture and health topics on other pages. 8. Do you use the content laid out in the social network for physical training and sports. 9. Athletic and health information, laid out on the pages of people you do not know, leaves you indifferent. 10. Do you put "Laiki" on the physical culture and health information on other pages. 11. Do you participate in "groups" (discussions) on physical culture and health topics. 12. Are you positive about the spread of physical culture in social networks. 13. Did you distribute the fitness and health information to other pages (videos, photos, etc.). 14. Do you use the social network to search for sports and health information. The diagnostic key: the evaluation is based on the summation of all points scored by the subject on the following scale: "Yes" – 3 points, "More Yes, No" – 2 points, "No more than Yes" – 1 point, "No" – 0 points (except 9 questions – "Yes" – (-2) points, "More Yes than No" – (- 1) point, "No more than Yes" – 0 point, "No" – 3 points).		
Less than 10 points: the student does not show a value need for physical culture and health activities and, in general, the process of forming a physical and healthy image and lifestyle.	From 10 to 20 points: the student shows interest and need, realizes the social importance and necessity of forming a physical and healthy image and lifestyle, actively participates in discussions and discussions on physical culture and health topics.	Over 20 points: the respondent reveals an active physical culture and wellness outlook through conviction in the idea of the impossibility of normal vital activity and effective professional activity without maintaining a physical and healthy image and lifestyle

Health indicator		
Purpose: to determine the level of physical health, based on the evaluation of the indicator of functional characteristics. Method: Diagnosis of the level of somatic health. Contents of the diagnostic: monitoring the number of students who have hospital sheets or certificates for hospitalization or exemption from training for health reasons, including physical education classes or a sports section. The diagnostic key: Low level – the student missed for health reasons over three academic years more than 60 hours (inclusive). The average level – the student missed for health reasons over three academic years more than 30, but less than 60 hours. High level – the subject missed for health reasons for three school years not more than 30 hours (inclusive).		
Characterized by a low level of physical health based on a low assessment of the adaptive potential as a quantitative indicator of health.	It is characterized by an average level of somatic health based on an average assessment of the adaptive potential as a quantitative indicator of health.	It is characterized by a high level of physical health based on a high assessment of the adaptive potential as a quantitative indicator health.
Educational indicator		
Purpose: to reveal physical culture and health knowledge, to define understanding and possession of physical culture and health knowledge and skills of their application in practical activities. Method: a modified system of levels of training in the taxonomy of B. Bloom in terms of levels of physical fitness and health competence (knowledge, understanding, application). Contents of the diagnostic: Level 1 – knowledge (testing with the choice of the correct answer): the memorization and reproduction of the studied material by the students in the context of different types of content was verified, from concrete facts to holistic theories. Level 2 – understanding or comprehension (testing with the suggestion of the answer or with a substantiation of the chosen answer): the ability of learners to transform a material from one form of expression into another – its "translation" from one "language" to another was defined. Level 3 – application (practical demonstration of the acquired knowledge): the ability of students to use the studied material in specific conditions and in new situations was revealed on the basis of the application of rules, methods, concepts, laws, principles, theories. The diagnostic key: testing consisted of three parts: one level – 60 questions (choosing the right answer from 3 to 4 options); on the 2nd level – 30 questions (suggesting your answer or choosing the correct answer from 3 to 4 options with the obligatory justification of the chosen answer); on 3 levels – 15 questions (practical demonstration of the acquired knowledge). Processing of the results: summing up the scores obtained as a result of the testing according to the following scheme: $X = A + B * 2 + C * 4$, where "A" is the number of correct answers for 1 level, "B" – the number of correct answers for level 2 , "C" – the number of correct answers on level 3.		
Less than 84 points: the student remembers and reproduces in the context of various types of content – from concrete facts to basic concepts and holistic theories studied material in the field:	More than 85, but less than 144 points: the learner is able to transform material from one form of expression in the other. As an indicator of understanding is the ability to interpret the material (explanation, summary) or the assumption of a further course of events and events. Understands the facts, rules and principles of the formation of physical culture, describes the future consequences arising from the available data in the context:	More than 145 points: the respondent manifests the ability to use the material studied in new situations based on the application of rules, methods, concepts, laws, principles , theories. The learner is able to use in practice and applies in specific practical situations knowledge in the aspect:

- methods of physical education and self-education to enhance the body's adaptive reserves, promote health, including non-traditional and national types of exercise;
- the basis for ensuring the protection of life and health of students in the teaching and upbringing process and after-hours activities, taking into account the region;
- medico-biological and psychological bases of physical culture, including national features of the ethnos.

Statistical analysis. To organize the experimental study, a mathematical statistics method was used, which was used to quantitatively analyze the experimental data. To compare the EG and CG distributions in the context of the mathematical and statistical processing of the results of pedagogical studies, we used X^2. The choice of this criterion for mathematical-statistical processing is due to the following characteristics: the application of the criterion is possible when the results of EG and CG groups on the state of the studied property, the attribute are distributed into more than two categories (class), in our case to levels (high, average, low); allows the transfer of scores obtained as a result of diagnostics of the formation of indicators in the levels (high, average, low) and build tables of distribution of points to find the number of people at these levels, and also allows to prove that in one of the levels (in one of the categories) the number of people is really more or less (Nagovitsyn et al., 2017).

3. Discussion
In the special scientific literature, the issues of introducing health technologies into the vocational training of teachers have been thoroughly studied. There are several key areas in the presented problems. The first line is connected with the search for solutions to problems, insufficient response of the education system, significant changes in the life activity of the society in the aspect of satisfying the health of the saving educational needs of modern students.

Beginning the discussion in this direction, let's turn to D. Puttnam (2015) research, in which the author puts urgent questions to the existing system of education and offers original solutions for the formation of independent, adapted to life, harmoniously developed personalities in students.

In their work, Y. Duan (2015) and others raise the problem of lack of attention on the part of management of educational organizations on the adaptation of the schoolchild to the university, towards the beginning of adulthood in the direction mental health. The authors offer a special psycho-social program for social support, a system of physical activity and a set of health-improving procedures. The effectiveness of the created conditions is proved by researchers on the basis of positive indicators of health, emotional state and anthropometric data of students, increasing their self-efficacy and learning activity, as well as active internal motivation to maintain a healthy lifestyle. The work of A. G. Papaioannou (2017) is devoted to the direction of professional training on the formation of an integral, harmonious and internal motivational to the physical activity of the individual. Based on the historical pedagogical approach, the physical culture and health methodology in the field of philosophy of education and the concept of cultivating the Olympic ideals, the author created a technology for motivating students to physical activity, health, well-being, friendship and mutual respect.

S. Spengler (2015), A. Woll (2015) propose and justify the concept "The more you are active, the more health you have." Based on the analysis of the correlation between physical activity and the quality of life in adolescence, the need to implement a sports club and an appropriate leisure system for students is proved in the educational organization. The study uses the original linear and multiple regression analysis to measure the physical activity of respondents in their free time. How to properly reconsider the perception and prepare students in the psycho-physical aspect to the transition from high school to higher education, are devoted to the scientific research of R. McPhail (2015). The author proposed a new methodology for this problem, developed and experimentally proven the original program for adapting freshmen at the university.

The next direction in the development of methodology and the implementation of health technologies in the professional training of teachers is focused on creating the currently required social and pedagogical conditions for the formation of a physically, intellectually and spiritually developed personality. In the foreseeing of the presented problem, the scientific work of

S.V. Sergeeva (2014), O.A. Voskrekasenko (2014), which offers an integrated program of educational work, developed on the basis of a system-functional approach, and successfully implemented at the university. The goal of the program is the organization and implementation of educational work to develop the personality of students, create conditions for their self-determination and socialization.

The development of the technology of health-preventive work was carried out in her scientific researches by P. H. Kulinna (2013). She proposed structural activities in three main areas: a model of psychosocial impact on youth, a model for the organization of rational youth physical activity and comprehensive programs of the school health system. Attention is drawn to the study of T. McFadden (2017) and others on the prevention of mental health through the activation of a special system of motor activity. The statistical results in their work showed that the depressive symptoms of university students are decreasing, and their motivational state to cognitive activity and life self-esteem is increased from baseline to high.

The research of L. Shagrir (2015) is noteworthy, in which the actual goal is stated: the development of a professional concept that defines interactive activities in the field of health of the savings of teachers and students. The results of her research show three types of conceptual principles: the role of educators is to help learners to adapt, to succeed in learning and to expand their connections with them; teachers should expand the ability of students and help them grow and build their professional identity as teachers; When directing their students, teachers should act as an intermediary between theory and practice. In the aspect of methodological substantiation of the student's personality development, the work of H. Messenger (2015) is interesting. In work on the basis of naturalistic and ethnographic approaches, a sociocultural complex model of perspective education, upbringing and personal development of students in college was developed.

In his scientific work R.S. Nagovitsyn (2014), proposes the implementation of the educational space of a liberal arts university to form a harmonious personality in the physical culture based on mobile technologies. The author proposes the formation of a healthy lifestyle for students through the introduction of the author's methodology for the development of physical and mental qualities in the educational and upbringing process to prepare for testing the standards of the GTO (Nagovitsyn et al., 2015). In turn, the joint scientific research reveals a new approach to the implementation of physical culture and health in the northern region of the country by means of the author's program of skiing and improving winter running (Nagovitsyn et al., 2017).

Continuing the discussion, let us turn to the scientific work of P.A. Hastie (2017) and others, in which the process of teaching students on the basis of projects (PBL) in the field of recreational activities was studied in detail. Using the two-level hierarchical linear model (HLM), the authors show significantly significant results in the effectiveness of preventive health work, including the organization of a health-saving environment and various fitness and pilates techniques.

And the last key aspect of the methodology for the implementation of health and preventive activities in the educational space is related to scientific research on the theoretical and methodological justification for the formation of health-saving competence of students using various technologies and innovations (Nagovitsyn et al., 2016).

So, in his scientific work S. Finkam (2005) represents the theoretical and methodological foundations for the formation of a healthy culture of the working population, as well as student youth. S. Barradell (2017), T. Peseta (2017) justify the need to introduce conceptual approaches to the healing process of the younger generation. The authors propose the modernization of students' curricula in the direction of health-saving technologies.

In their scientific research H. Kienzler (2017), C. Fontanesi (2017) prove the effectiveness of the application of the new method of learning based on the program (IBL) in the aspect of developing a special course "Introduction to global health". The created course forms professional competencies for undergraduate students in solving specific problems related to health, and at the same time promotes the acquisition of special skills in the cultivation of a healthy lifestyle.

In turn, N.A. Barbarash (2016), D.Yu. Kuvshinova (2016) represent the results of the educational and scientific activities of the teaching staff on the development of ways to motivate the population, including students to a healthy lifestyle. In the satire, topical questions are posed in the aspect of the methodology of the science of health and the options for their solution. They proposed an unconventional program consisting of motivating lectures and talks on the verses of A. Pushkin, O. Mandelstam, I. Huberman, V. Dagurov, based on a humorous approach to this problem.

Continuing the discussion, it is worth mentioning the research work of R.I. Aizman (2014) and others, which examines the main problems of health-saving activities in the education system: the low level of professional competence of pedagogical workers, methodical, material and technical, information base; unsatisfactory use of the health-saving potential of a number of educational programs; lack of a mechanism for departmental and interagency cooperation, underdevelopment of the regulatory and legal framework. Immediate tasks are set to solve these problems and the main directions of the established Coordinating Council on the health of students and teachers within the framework of the Expert Council on Health and Physical Education of Students at the State Duma Education Committee.

The scientific work of M.A. Maznichenko (2013), N.I. Neskoromnykh (2013), which proposed an original comprehensive approach to the prevention of adolescent social dependencies through the development of a classification of integrated pedagogical tools. Concluding the theoretical study, the remarkable work of D. Dudley (2016) and others, which attempts to solve the research problem in all three directions, is remarkable. The study presents the United Nations international programs on the interaction of education and health in the education and upbringing of the younger generation. Optimizing physical education is a model offered by the authors in their research. Based on the use of the "clinical" approach, scientists prove the absence of evaluation systems that are able to solve both the health goals and educational ones. In the experimental part, original methods are proposed that give a new idea, rethinking the role of health-preventive work in the education system.

Despite a significant number of scientific works in the research direction, it should be noted that there is an urgent need for systematization and methodological justification for the implementation of the educational process of students using the health of saving technologies. In the scientific literature, the issues of introduction of health-improving technologies in vocational training of teachers have been thoroughly studied, however, the development of a systemic health-preventive environment of a pedagogical university has not been carried out to date. What ultimately should contribute to ensuring the output of professional teacher education to a higher quality level through the integration of various clusters, components and innovative technologies in the field of health savings training (Nagovitsyn et al., 2017).

In the development of models, we used the scientific work on theoretical modeling in higher education M.A. Dahlgren (2016) and others. The authors propose a "sociomaterial" view on the implementation of the educational process in terms of identifying the following areas: material, situational, representative and relational. The fundamentals of models in their scientific work reflect the systematization of training in the case of European countries: Australia, Sweden and the United Kingdom. Which illustrate various approaches to modeling and related features in the emerging forms of learning. On the basis of general scientific methods of research in the aspect of development of theoretical and methodological foundations, a structural model of the program "Health-saving education" was created in the pedagogical university (Fig. 1).

To implement the program, the activities of university structures aimed at protecting and promoting the health of students, teachers and staff of the university, deputy deans in educational and social work, curators and tutors of academic groups, a trade union student organization, including the sports and health committee of the trade union bureau, are organized. To promote the implementation of certain areas of the program involved organizations involved in the protection and promotion of health in the city of Glazov. The main executors of the program were: the department for educational and social work; trade union organization of students and graduate students; Department of Physical Culture and Life Safety; the center of leisure and creativity; sport Club; service of social and psychological support of students; psychological club "Synergy"; Combine student food; sanatorium-preventorium of the university; health center of the Institute; council for educational and social work; Department of Pedagogical and Art Education; curators and tutors of academic groups; bodies of student self-government; a student detachment of law and order "Sirius".
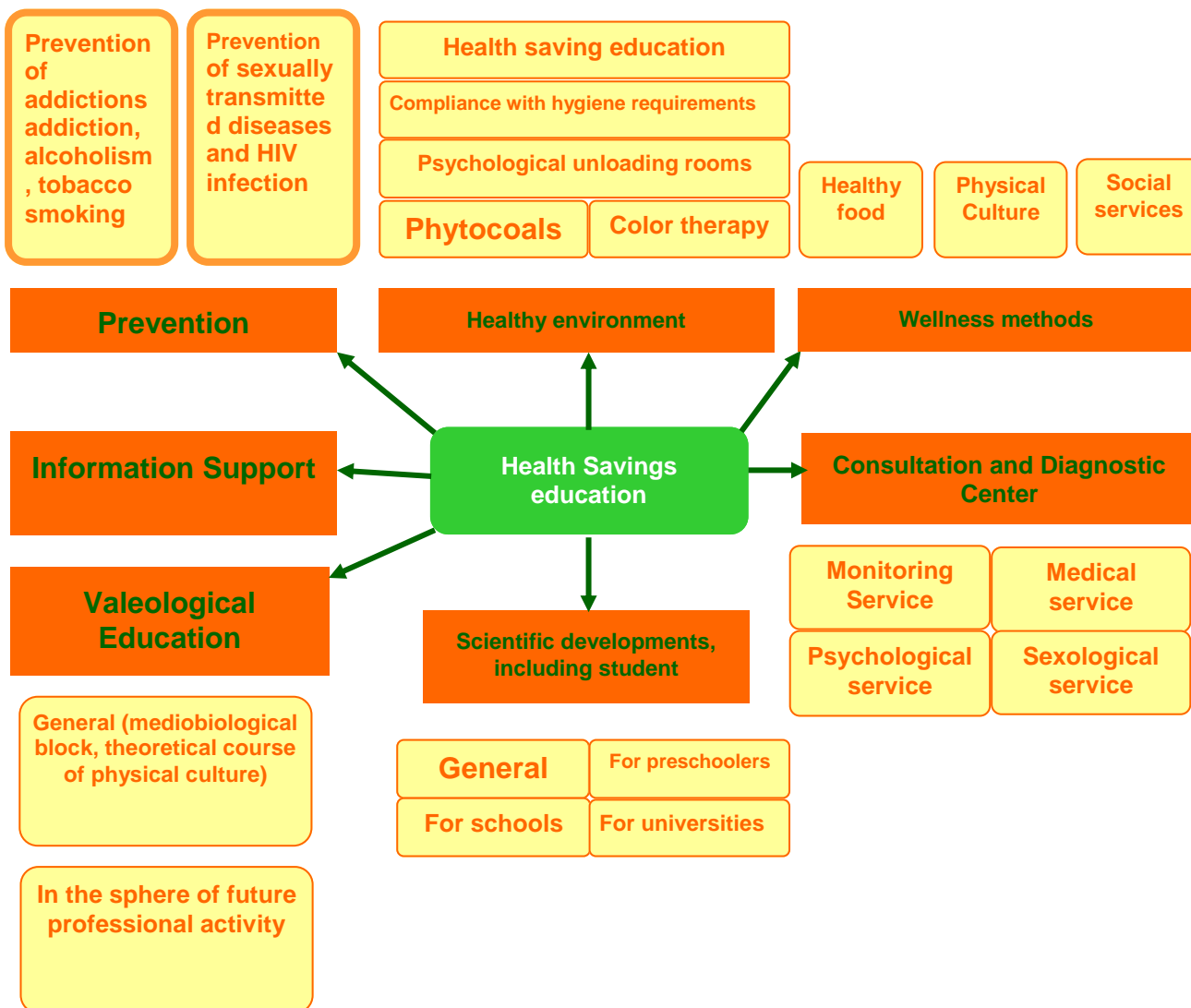
Fig. 1. Structural model of the program "Health saving education"

The system program "Health Savings Education" was developed on the basis of the law of the Russian Federation "On Higher Professional and Postgraduate Education", the federal target program "Comprehensive Measures against Drug Abuse and Illicit Trafficking for 2009-2010", Federal Law No. 3 "On Narcotic Drugs means and psychotropic substances "dated 08.01.1998, Federal Law No. 87" On restriction of tobacco smoking "of 10.07.2001, Federal Law No. 38" On preventing the spread of the disease caused by the virus in the Russian Federation (HIV infection) "from 30.03.1995, the Federal Law" On Narcotic Drugs and Psychotropic Substances "from 10.12.1997 year.

Based on private scientific methods of research, a model of management and provision of health-preventive activities in a pedagogical university was created in the view of developing the organizational and managerial foundations of the program "Health Savings Education" (Fig. 2).

The model is a definition of management processes, the processes of providing work, a list of directions and the final outcome of the organization of health-prevention activities. The developed model is based on the principles of pedagogical design and scientific developments in the field of quality management of the process.

The management processes of the health-prevention system are: monitoring system: diagnostics of the state of all activities of the program; development of the program: the formation of an action plan, coordination of the work of structural units, identification of the main and auxiliary processes, the deadlines for the implementation of measures and the system for assessing

effectiveness; resource mobilization: identification of material, administrative, technical resources for the implementation of the program at the level of the institute, faculty, structural unit, distribution of duties and responsibilities of its participants; program monitoring: is conducted annually after the end of the school year. The monitoring objects are: the progress of the planned process, assessment of the reasons for the failure of its activities, management of changes, needs, expectations and satisfaction with the results. Capacity building of the program: assessment of the real state of program implementation, identification and planning of improvements, setting new goals for its implementation for the next period.
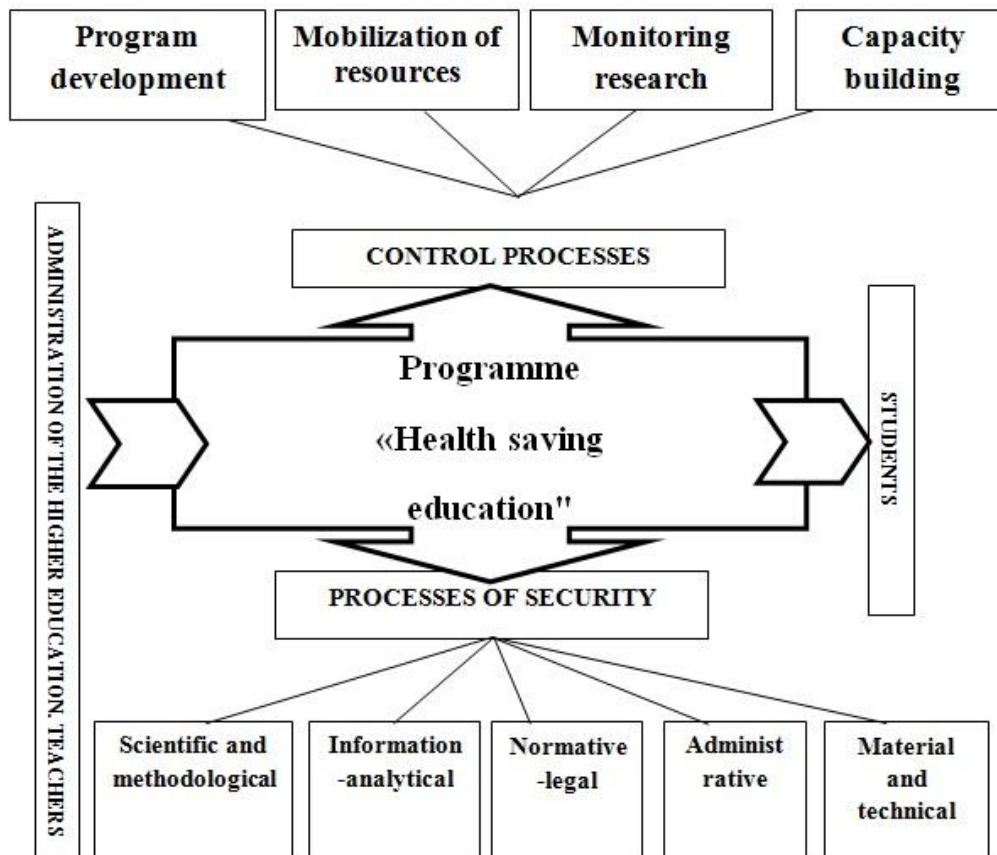
Fig. 2. Model of management and provision of health-prevention activities in the pedagogical university

The processes of ensuring the system of health-prevention activities are: information and analytical support: publication of information materials for students, methodological guides for curators of academic groups, maintenance of special headings on the Institute's website and faculty websites, faculty newspapers, trade union student newspaper "Creative"; regulatory and legal support: development and implementation of normative and legal documents necessary for effective health-prevention activities; scientific, organizational and methodological support: study of advanced developments in the field of health-saving technologies in education, development and implementation of educational and methodical complexes, grandiose educational activities; generalization of diagnostic data; administrative support: creation of the Coordination Council, at the level of the university implementing the main directions of the program, organizing working groups at faculties, as well as other services that organize health-prevention activities; financial, material and technical support: planning of material resources for the organization of health-preventive work.

4. Results

To identify the effectiveness of the implementation of the educational process using the program "Health saving education" on the basis of the development of a structural model and management and support model, in the fourth quarter of 2015, data was collected from the respondents participating in the study and three indicators were monitored (Fig. 3-5)
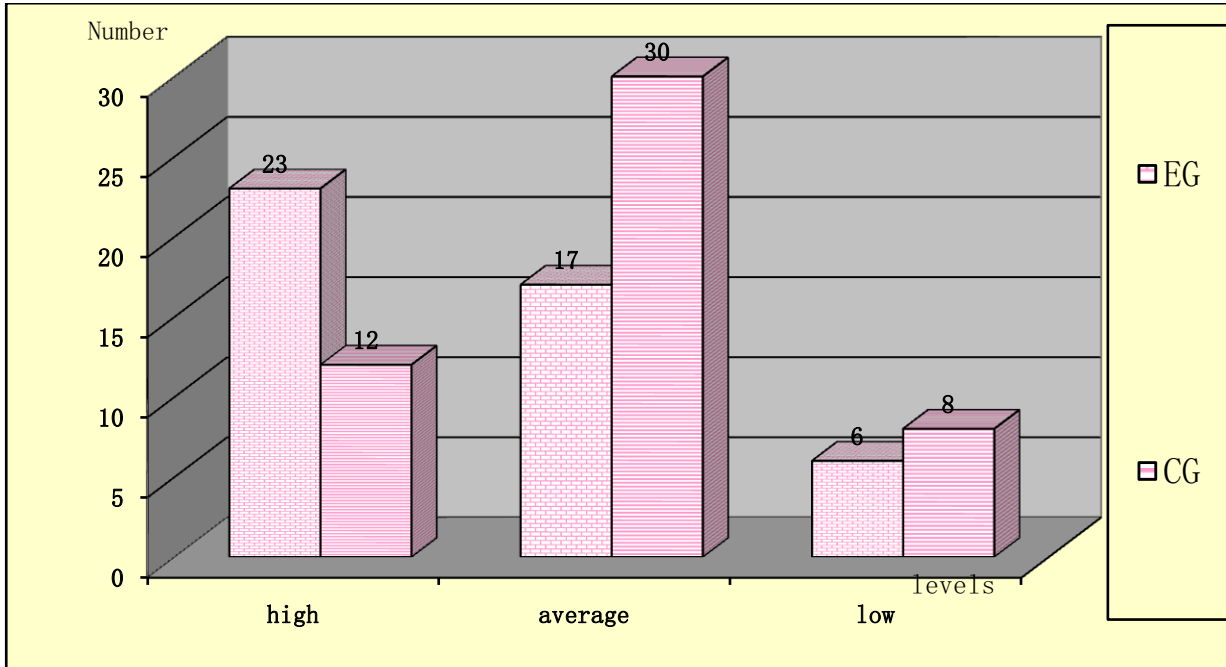
Fig. 3. Results of comparative analysis of EG and CG by educational indicator
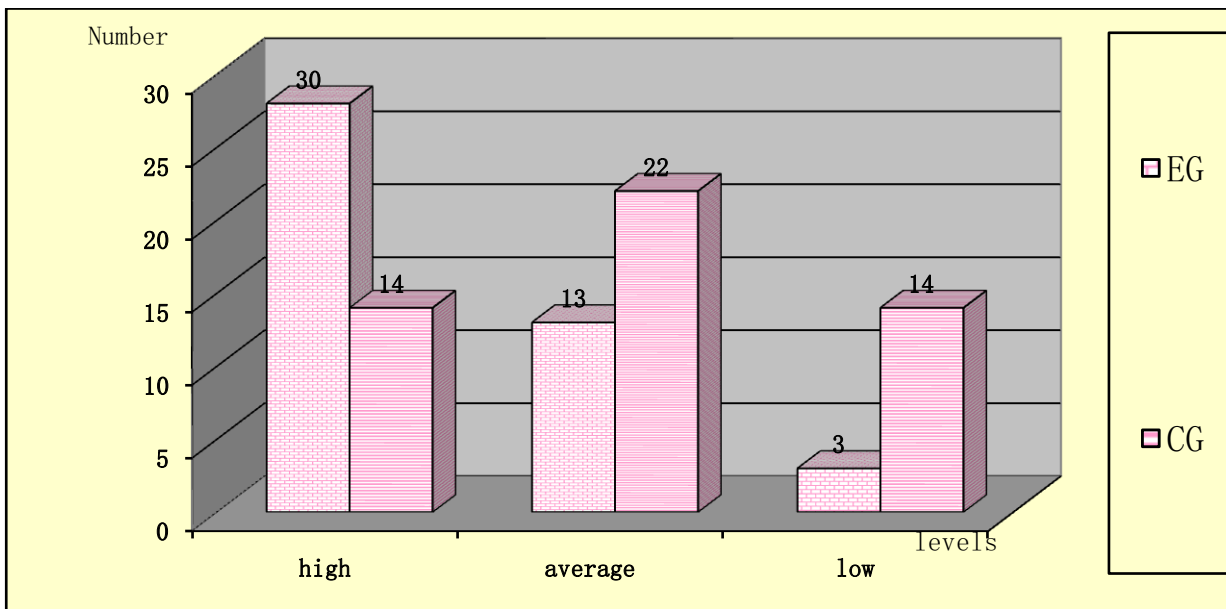
Fig. 4. Results of comparative analysis of EG and CG by upbringing indicator
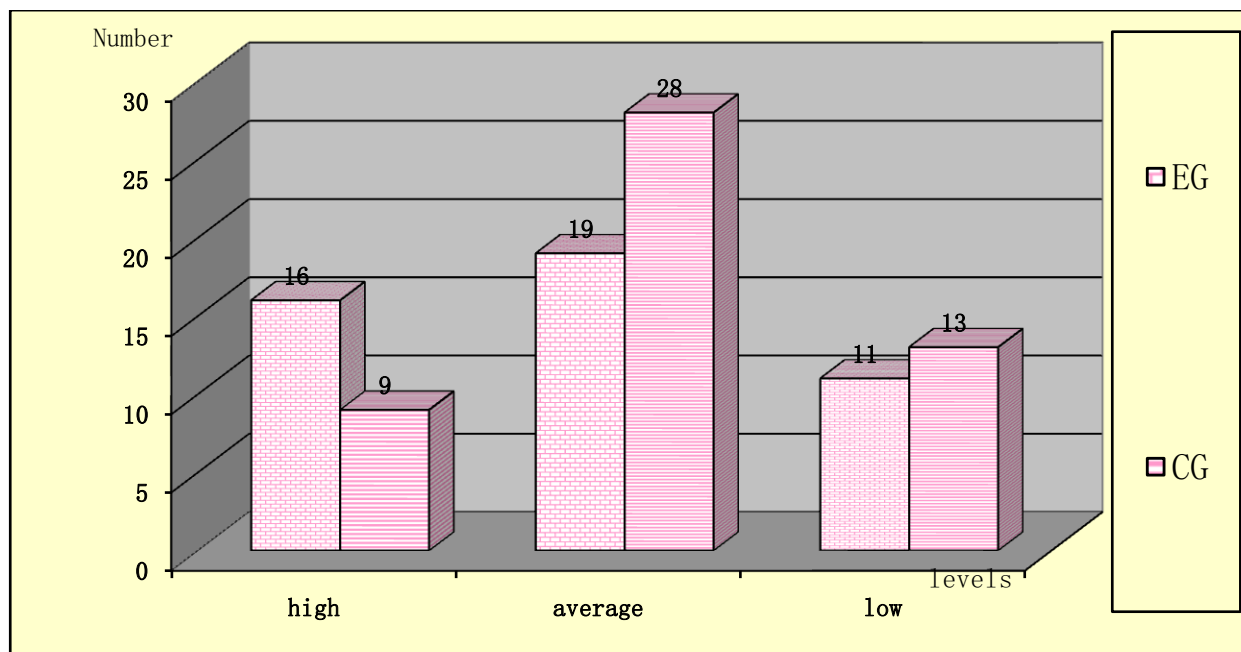
Fig. 5. Results of comparative analysis of EG and CG by health indicator

The obtained numerical data were subjected to mathematical-statistical processing by X^2. Comparison of the distributions of EG and CG on the basis of the results of pedagogical studies for all three indicators revealed a statistically significant difference $P < 0.05$. This, in turn, proves the reliably significant effect of the applied author's models on the implementation of vocational training at the institute.

Based on the obtained data of the conducted experiment and a comparative study between the experimental and control groups, it was revealed:

- in the EG in full-time education at the Faculty of Pedagogical and Art Education, where during the three academic years (2012/13, 2013/14, 2014/15) implemented the program "Health saving education", recorded a significant increase, compared with the CG, the number of respondents at a high level, and a significant decrease in the number of respondents at a low level, as compared to the CG. This confirms the effectiveness of the implementation of the educational process on the developed structural model and model of management and provision of health-preventive work in the pedagogical university;

- the introduction of the author's program "Health saving education" had the most significant increase, according to the upbringing indicator. This, in turn, proves that specially organized systemic health-preventive work promotes the manifestation of interest and need among learners in the promotion a physical and healthy image and lifestyle. In this regard, there is a significant increase in the number of students who have an active health-saving position through conviction in the idea of the impossibility of normal life activity and effective professional activity without the implementation of health-prevention activities.

5. Conclusion

Thus, the study developed a structural model and model of management and provision of health and preventive work, as the basic, fundamental foundations in the structure of pedagogical health-saving education for teachers. And as integrating resources and scientific and educational potential of higher professional education. The main indicators of the effectiveness of the implementation of the program "Health saving education" (educational, health and upbringing) are presented, levels and their detailed characteristics are revealed.

The research has solved actual problems in the direction of improving the theoretical justification for the process of health education of future teachers in the aspect of implementing the author's system program, provided that it is structured in providing and managing. Based on the specially organized experimental work and the development of diagnostic tools on the basis of

B. Bloom's classification in the author's modification, the effectiveness of the implementation of the program "Health saving education" has been proved, in the aspect of ensuring the output of professional pedagogical education to a higher quality and health-saving level.

The practical significance of the research is that the use of the author's program will allow us to reach the higher quality level of the professional training of teachers, which ensures the individual-differentiated health-saving development of the student. The proposed patterns, provisions and conclusions create prerequisites for further study of the phenomenon of implementing health-saving education in methodological, content and management aspects. The presented practical experience of implementing the program "Health saving education" can be used to build a professional space in other educational organizations.

6. Acknowledgements

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The Relationship Between Leadership Styles (Autocratic and Democratic) of School Administrators and the Mobbing Teachers Suffer

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Abstract

The aim of the study is to investigate the relationship between democratic and autocratic leadership styles of school administrators and mobbing teachers experience as well as determining whether these leadership styles predict the mobbing level teachers suffer. The data in the study were collected from 395 primary school teachers (165 male and 230 female) in central districts of Mersin, Turkey. "Mobbing Scale" was used to determine what extent teachers suffer from mobbing and "Leadership Style Scale" to measure leadership style of school administrators. According to the analysis results, gender accounts for a significant diference in only "interference in private life" of all five dimensions of mobbing while seniority accounts for a significant difference in "barriers about work and career" and "work commitment" dimensions. There is a negative relationship between democratic leadership and all dimensions of mobbing except for work commitment while it is positive with autocratic leadership. Lastly, autocratic and democratic leadership styles of school administrators predict all dimensions of the mobbing teachers suffer except for work commitment.

Keywords: leadership styles, autocratic, democratic, mobbing, teacher, school administrator.

1. Introduction

It is a fact that non-organisational factors such as social events, technological developments and economic activities have effect on organisational structure and relations. In particular, neoliberal policies adopted and practiced both nationally and globally cause a competitive atmosphere not only within the organization but also inbetween organisations. Because of this, organizations take the other ones as rivals while organizational members might as well see each

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other as opponents. The success in such a climate depends on showing a better performance than the others (colleagues). This situation is expereinced more in private sectors but it also reflects upon public organizations. It is frequently seen that organizational administrators and members apply "mobbing" consciously or unconsciously, overtly or covertly to attain organizational and personal goals.

Mobbing has been a research subject in Europe and USA for years, but, it is a recent issue to be researched in Turkey. According to Tigrel and Kokalan (2009), such a delay in research is because people couldn't express that they were exposed to mobbing though it has always been experienced in Turkey. Sharing such incidents with others is regarded weakness due to the traditional social structure. That's why the sufferers of mobbing have tried to conceal expressing exposure to mobbing.

In this regard, mobbing refers to harassment, intimidation, pressure, force and psychological violence (Yavuz, 2007; Demir, 2009; Tetik, 2010). Tınaz (2006) defines it as disturbing, causing distress and enclosure. Leyman (1996) describes it that the victim constantly and systematically suffers from aggressive, insulting, hostile and unethical behaviors, thus becomes helpless and defenseless. According to Leyman's definition, the frequency and duration of the mobbing behavior is important as well as its nature. Leyman (1996) indicates that such behaviour to be accepted as mobbing must continue at least for six months and once a week. It is aimed through mobbing that the victim will be isolated, eliminated and excluded from the group or organization (Westhues, 2003).

It is stated that the people in management positions are the most frequent mobbing practicers (Yavuz, 2007). It is seen that these people are weakling and jealous, afraid of losing their current positions, and acting according to their motives (Çobanoğlu, 2005). It is alleged that what lies behind their behaviours is that they don't give value to life and differences, their dishonesty and need to give themselves airs (Ocak, 2008). While Leyman (1996) states that people apply mobbing to compensate their deficiencies, Tınaz (2006) describes them as oppressing subordinates in an inferiority complex and ingratiating themselves with their superiors. It is inferred from the statements above that mobbing practicers are the ones who lack self-confidence and protect individual interests and concern.

Mobbing is an attack that aims to destroy one's self-esteem and self-confidence. The mobbing practicers intend to make their targets dependent on themselves (Demir, 2009). In this way, the mobbing victim is made to obey the practicer with no question and agrees on practicer's personality, thoughts and position. Besides that, it is also known that some psychological disorders result in mobbing behaviours. Tutar (2004) states that individuals with obsessive-compulsive disorder are apt to practise mobbing because of their uncontrolled, negative thoughts.

The reasons listed above fall short to explain mobbing. There are also organizational factors leading to mobbing. Mercanlıoğlu (2010) remarks that the organizations with weak organizational culture, autocratic leadership, one-way organizational communication, no team work and where reasons for conflicts are neglected are more like to experience mobbing. It is seen that social atmosphere is convenient enough to initiate mobbing in organizations with a poor management and strict hierarchy (Çalış ve Tokat, 2013). According to Demir (2009), organizational culture and structure triggers mobbing, and thus, during designing management functions, the organization must be purified from factors causing mobbing. Management functions should cover abstract concepts such as vision, mission, organizational culture and climate. For that reason, a human-focused organizational culture is one of the factors to prevent mobbing. On the other hand, Ocak (2008) lists organizational factors that cause moobbing as: poor management, intense stress at workplace, monotony, administrators' denial and disbelief in existence of mobbing in their organizations, unethical practices, changes in organizational structure and lack of emotional intelligence in leaders. As seen, organizational administrators plays an important role in causing or preventing mobbing. The leadership style that organizational administrators adopt will be effective on organizational structrure, relations and communication.

Mobbing process has serious effects and results on individuals. There is no doubt that mobbing victims are the most negatively influenced people of this process. It may cause various results from organizational alienation to suicide. Tınaz (2006) puts emphasis on economic, social and medical dimensions of mobbing. An individual who leaves his work because of mobbing gets into poor economic conditions, is excluded from workplace, loses his professional identity and all

these also result in loss of prestige both in family and social environment. Negative reflections of the all are seen in one's psychological and physical health. According to Ocak (2008), a mobbing victim feels dashed, shunned, humiliated and stressful, and as a result of this, experiences psychological disorders such as loneliness, loss of self-confidence, hopelessness, helplessness, inferiority, short temper and social isolation. Besides, mobbing victim goes through burnout and alienation as a considerable level if he does not leave his work (Brudnik-Dabrowska, 2014). Aggreeing all the listed above, Dabu and Draghici (2013) point out that all these may lead the victim into suicide.

It is essential to take organizational dimension in effects of mobbing as well as in its causes. Tınaz (2006) puts forward that mobbing has psychological and economic costs for the organizations.disagreements and conflicts between organizational members, negative organizational climate, weakness in organizational culture, lack of trust, poor respect and reluctance of workers are of the psychological costs. On the other hand, economic costs can be listed as increase in sick leave, qualified staff's leave of employment, and because of this, increase in cost of new employment and their training, decline in performance, low quality of work, compensation given to victims, unemployment cost, court expenses and early retirement. Considering that the qualified staff in critical positions may leave their job, it might as well be seen that economic loss of the organizaiton is quite high (Sloan et al., 2010). Ocak (2008) states that, as mobbing causes a stressful climate within the organization, teamwork will get worse, organizational trust will get lower, and organizaitonal conflict will inevitably occur. Tetik (2010) indicates that mobbing will have negative impacts on organizaitons since it reduces workers' efficiency, job satisfaction, organizational commitment and trust level. It is obvious that mobbing leads into considerable negative results for both individuals and organization. Noticing this and taking precautionary measures or preventing it primarily depends on organizaitonal administrators. Therefore, the leadership style of organizational administrators at this stage gets important.

Many definitions of leadership have been offered, but none of them accepted by all researchers. However, we aimed by determining leadership styles to determine the behavioural tendencies and focus of administrators. Benfari (1999) indicates six main factors for a successful management. Psychological style is related to personal attitude of the administrator and it is difficult to change as it is long termed. Therefore, instead of changing it, adaptation or guidance can work by determining weak and strong sides. Second factor is the needs. Individuals' needs influence their personality. Third one is power. Concept of power, influencing other people, shows relations in life. Some people prefer influencing others in a positive way while some others prefer negative ways. The values are the fifth. It is about whether the conflicts will be taken in a win-lose or win-win strategy. The fifth is values. It is about determining ideals and beliefs and guiding them. Culture, social institutions and personal experiences affect the formation of values. The last factor is stress. Stress is the reaction to pressure. Stress reactions are indicators of how the conflict is being dealt with. Experiences through life and individual differences determine how we react to internal and external stress factors. It is important to try to understand and overcome the problem in its own course instead of staying away individually from the problem like "fight or flight".

Williams (1999) states that working styles of leaders appear on a bipolar continuum: from "developmental" styles to "controlling" styles. Encouragement, participation in relations, supporting change, expanding freedom area and creating space for individual choices, and behaving flexibly and adaptively are seen in developmental styles. Common benefits and efforts like discussion, debate, evaluation of change, cooperation and rearrangement are important in these styles. As approached to controlling styles, these behaviours tend to appear: giving instruction and controlling, one-way thinking, trying to preserve the existing situation, forming a disciplinarian and structured work environment, trying to doing things accurately, caring about consistency between works and willing to work alone. There is a dualist approach such as right-wrong or good-bad to a great extent in this style.

There are various kinds of leadership styles in administrational area, however, in this study, democratic and autocratic leadership were discussed. According to Williams' (1999) categorization, autocratic leaders show "controlling" behaviours while democratic leaders exhibit "developmental" behaviours. Autocratic leaders make the employee do their job without right to choose; whereas, democratic leaders try to have the work done by giving them right to choose, and also give importance to increasing sharing and willingness in mutual respect by considering organizational

communication and group dynamics (Ferguson, 2011). In other words, democratic leaders try to form an organizational power by providing an atmosphere the employees can share their feelings, ideas and experiences and showing they value everyone's ideas (Brookfield, 2010). However, autocratic leaders would like to maintain the strict hierarchial structure of the organization and prioritize the work rather than human relations. Uysal and Yavuz (2013) point out that mobbing is observed more in organizations of hierarchial and autocratic structure.

It is known that most of the mobbing practicers are organizaitonal administrators (Dick ve Wagner, 2001; Ocak, 2008). This fact requires the relationship between leadership styles and mobbing to be examined. There are a number of researches studying this relationship. Cemaloğlu (2007) studied the relationship between transformational-transactional leadership and mobbing. He found a negative relation between both leadership styles and mobbing in his study. According to this, as the school administrators exhibit transformational leadership behaviours, there is a considerable decrease in mobbing. Daşçı and Cemaoğlu (2015) revealed similar findings. Kul (2010) examined the relationship between leadership styles and mobbing, organizational commitment and job satisfaction in his master's thesis. What he found in his study supports the findings of former researchers. In the study titled"A Story to Tell: Bullying and Mobbing in the Workplace", Sloan and his friends (2010) suggest a theoretical framework anout mobbing's reasons and results underlining the importance of administrative leadership in preventing mobbing. Shahbazi, Naami and Aligholizadeh (2013) exmined the relationship between paternalistic leadership and mobbing. Paternalistic leadership was taken in three dimensions: benevolent, moral and autocratic leadership. It was found that there is a negative relation between benevolent-moral leadership and mobbing but a positive relation between autocratic leadership and mobbing. Cerit (2013) also studied the relationship paternalistic leadership and mobbing. In the study that paternalistic leadership was taken in one dimension, it was found that there is a decrease in mobbing as school administrators show paternalistic leadership behaviours more. LAstly, Ertüreten, Cemalciler and Aycan (2013) studied the relationship between transformational, transactional, autocratic and paternalistic leadership and mobbing. Acording to their research results, there is a negative relation between transformational, transactional and paternalistic leadership and mobbing while it is positive between autocratic leadership and mobbing.

As seen in the studies mentioned above, though the relationship between various leadership styles and mobbing has been examined, there is no research that studies both democratic and autocratic leadership's relationship with mobbing, and also their predictive power on mobbing. Therefore, it is expected that this study will make an important contribution to the literature.

Aim of the study

The main aim of the study is to investigate the relationship between democratic and autocratic leadership styles of school administrators and mobbing teachers experience as well as determining whether these leadership styles predict the mobbing level teachers suffer. Regarding the aim, answers to the questions below were sought:

According to the views of teachers working in public schools in central districts of Mersin, Turkey;

1. Is there a significant difference in mobbing teachers experience in terms of gender?
2. Is there a significant difference in mobbing teachers experience in terms of seniority?
3. Is there a significant relationship between leadership styles (democratic and autocratic) of school administrators and mobbing teachers experience?
4. To what extent do leadership styles (democratic and autocratic) of school administrators predict the mobbing teachers experience?

2. Method
Research model

General survey model was used in this study. Survey models aim to give reply to the questions "what, where, when, what degree, how and how often" and describe a case as it is (Büyüköztürk et al., 2009). This study is descriptive as mobbing level that teachers experience and schoole administrators' leadership style were determined according to views of teachers. In addition, it is also a relational study because the relationship between leadership style that shool administrators adopt and mobbing level that teachers suffer was examined.

Population and sample of the study

The population of the study consists of 6,125 teachers working in public primary and secondary schools in central districts (Akdeniz, Toroslar, Yenisehir and Mezitli) of Mersin (Mersin Provincial Directorate of National Education, 2015). There are 395 teachers (165 male and 230 female) in the sample formed by unproportional sampling. According to figuring out the size of the sample from a population of which number of members is known (Saunders et al., 2009), the sample of the study is of 95 % confidence level, which is considered to be high enough. Detailed information about the sample is given in Table 1:

Table 1. Distribution of teachers according to gender and seniority

		N	%
Gender	Male	165	41,8
	Female	230	58,2
	Total	*395*	*100*
Seniority	0−5 year	55	14
	6−10 year	63	16
	11−15 year	87	22
	16−20 year	75	19
	21 year or over	115	29
	Total	*395*	*100*

Data collection tools

Data collection tool is comprised of three parts. Personal information about the participant (gender and seniority) is in the first part; "Mobbing Scale" (Laleoğlu and Özmete, 2013) to determine what extent teachers suffer from mobbing in the scond part; and "Leadership Style Scale" (Taş, Çelik and Tomul, 2007) to to measure leadership style of school administrators in the third part.

Mobbing Scale

It is developed by Aiello, Deitinger, Nardella and Bonafede (2008), and adapted into Turkish by Laleoğlu and Özmete (2013). The original version consists of four dimensions (relations, threatening and harassment, barriers about work and career, and work commitment) and 48 items. It was translated into Turkish and practised to test its language validity. After factor analysis to test its construct validity, 10 items were omitted as they had negative values and reduced reliability of the scale. While it has four dimensions in original version, items gather in five dimension after factor analysis of Turkish version. These are "relations with colleagues" (17 items), "threatening and harassment" (7 items), "barriers about work and career" (8 items), "interference in private life" (4 items) and "work commitment" (2 items). Cronbach Alpha coefficient for the whole scale was calculated as .94 while it is .96 for relations with colleagues, .90 for threatening and harassment, .90 for barriers about work and career, .86 for interference in private life and .93 for work commitment. These values are seen to show consistency with the original version. In this study, Cronbach Alpha coefficient for internal consistency reliability was found .92 for the scale while it is .90 for relations with colleagues, .80 for threatening and harassment, .88 for barriers about work and career, .75 for interference in private life and .77 for work commitment.

Leadership Style Scale

It was developed by Tas, Celik and Tomul (2007) and aimed to measure leadership style of school administrators with 59 items. The researchers benefited from opinions of professors in the field for content validity. Coefficient of internal consistency of the scale was found.87 and it has five dimensions: Autocratic leadership (10 items), democratic leadership (13 items), laissez-faire leadership (11 items), transformational leadership (15 items) and transactional leadership (10 items). Coefficient of internal consistency of the scale was .87 while it is .70 for autocratic leadership, .87 for democratic leadership, .61 for laissez-faire leadership, .91 for transformational leadership and .55 for transactional leadership. In this study, only autocratic and democratic leadership dimensions were used in line with the aim of the study and the other dimensions were

neglected. Internal consistency coefficient for these two dimensions were calculated as .70 while it is .78 for autocratic leadership and .94 for democratic leadership.

These are 5-point Likert type scales. The items were evaluated from 1 to 5 and each interval is valued as: 1,00-1,79 (Never), 1,80-2,59 (Rarely), 2,60-3,39 (Sometimes), 3,40-4,19 (Usually) and 4,20-5,00 (Always).

Data analysis

20.0 version of SPSS software was used in analysis of the data. Essential statistical operations were done in regard to the aims of the study by entering the obtained data into the software program. T-Test was done to determine whether there is a significant difference in mobbing level teachers suffer according to their gender. In order to determine whether the parametric test can be used or not, it was determined whether the dependent variable is normally distributed in each condition of the independent variable. For this purpose, the size of the sample, normality tests and the standard values of the skewness of the data were taken together. It was inferred from data analysis that the number of units per each condition of the independent variable was n> 30, that dependent variable of mobbing had a normal distribution, and that t-test was appropriate to be employed as the other factors were found to be in the range of -3 and +3 in the standard values of the skewness (Büyüköztürk, 2005; Klein et al., 2000).

One-way variance analysis (ANOVA) was done to determine whether there is a significant difference in mobbing level teachers suffer according to their seniority. Correlation analysis was done to determine whether there is a significant relationship between leadership styles of school administrators and mobbing level teachers experience. As a last, multiple regression analysis was done to reveal to what degree leadership styles of school administrators predict the mobbing level teachers suffer. The results were interpreted and discussed in line with these analyses. In the study, 0.05 and 0.01 were taken as significance level.

Findings

The findings are given in this part in accordance with aims of the study.

Findings about teachers' opinions as to mobbing level they suffer according to their gender and senority

Table 2. t-test about mobbing level teachers suffer according to their gender

Mobbing	Gender	N	$\overline{X}$	Sd	t	p
Relations with Colleagues	Male	165	1,32	,41	1,846	,066
	Female	230	1,25	,36		
Threat and Harassment	Male	165	1,07	,27	1,045	,297
	Female	230	1,05	,15		
Barriers about work and career	Male	165	1,39	,52	-,180	,857
	Female	230	1,40	,57		
Interference in Private Life	Male	165	1,27	,42	2,011	,045*
	Female	230	1,18	,39		
Work commitment	Male	165	2,24	1,13	-1,305	,193
	Female	230	2,40	1,21		

According to Table 2, gender variance makes a significant difference in "interference in private life" dimension (t=2,011; p<.05) while there is no significant diffirence in "relations with colleagues" (t=1,846; p>.05), "threat and harassment" (t=1,045; p>.05), "barriers about work and career" (t=-,180; p>.05) and "work commitment" (t=-1,305; p>.05).

In "interference in private life" dimension, the mean for male teachers' views is $\overline{X}$ =1,27 while it is $\overline{X}$ =1,18 for female teachers. That means there is a slight but significant difference between male and female teachers' views (t=2,011; p<.05). The difference has a small effect size (r²=.01). Male teachers' views about interference in private life account for the difference.

Table 3. One-way variance analysis about mobbing level teachers suffer according to their seniority

Variances	Groups	n	$\overline{X}$ (mean)	sd	Source of Variance	SS (Sum of Squares)	df (degree of freedom)	MS (Mean Square)	F	P (significance)
	0-5 year	55	1,30	,35						
	6-10 years	63	1,24	,38						
Relations with Colleagues	11-15 years	87	1,29	,42	Between-Groups	,226	4	,056	,377	,825
	16-20 years	75	1,30	,39	Within Group	58,395	390	,150		
	21 years or over	115	1,26	,36	Total	58,621	394			
	Total	395	1,28	,38						
	0-5 year	55	1,05	,20						
	6-10 years	63	1,04	,09						
Threat and Harassment	11-15 years	87	1,09	,32	Between-Groups	,110	4	,028	,608	,657
	16-20 years	75	1,06	,16	Within Group	17,695	390	,045		
	21 years or over	115	1,05	,18	Total	17,805	394			
	Total	395	1,06	,21						
	0-5 year	55	1,60	,66						
	6-10 years	63	1,34	,54						
Barriers about work and career	11-15 years	87	1,36	,51	Between-Groups	2,883	4	,721	2,390	,050*
	16-20 years	75	1,40	,51	Within Group	117,568	390	,301		
	21 years or over	115	1,35	,54	Total	120,451	394			
	Total	395	1,39	,55						
	0-5 year	55	1,24	,40						
Interference in Private Life	6-10 years	63	1,21	,45	Between-Groups	,526	4	,132	,783	,537
	11-15 years	87	1,25	,44	Within Group	65,578	390	,168		
	16-20 years	75	1,25	,42	Total	66,105	394			

	21 years or over	115	1,17	,34					
	Total	395	1,22	,41					
Work commitment	0-5 year	55	2,26	1,12	Between-Groups	21,204	4	5,301	3,919	,004**
	6-10 years	63	1,95	1,06	Within Group	527,512	390	1,353		
	11-15 years	87	2,27	1,16	Total	548,716	394			
	16-20 years	75	2,31	1,17						
	21 years or over	115	2,65	1,22						
	Total	395	2,33	1,18						

Teachers' seniority variance makes a significant difference in "barriers about work and career" ($F_{(4-390)}$= 2,390; p<.05) and "work commitment" ($F_{(4-390)}$=3,919; p<.01) while there is no significant difference in "relations with colleagues" ($F_{(4-390)}$= ,377; p>.05), "threat and harassment" ($F_{(4-390)}$= ,608; p>.05) and "interference in private life" ($F_{(4-390)}$= ,783; p>.05). Tukey HSD test was applied to find the source of difference as Tukey (honestly significant difference) test requires that the sample numbers in groups be equal (Tukey, 1949). The sample numbers in the data of this study are equal.

The difference in "barriers about work and career" dimension is between the teachers in 0-5 years group and 21 years or over group (p<.046). Teachers of 0-5 years ($\overline{X}$=1,60) appear to face more barriers about work and career compared to teachers of 21 years or over. Teachers in 0-5 years group are also the ones to face barriers the most of all groups. However, the difference seems to have a small effect size (r^2=.024).

The difference in work commitment dimension is between the teachers in 6-10 years group and 21 years or over group (p<.001). Teachers of 21 years or over ($\overline{X}$=2,65) have higher work commitment than of 6-10 years ($\overline{X}$=1,95). Teachers of 21 years or over indeed have the highest work commitment of all groups. However, the difference is seen to have a small effect size (r^2=.039).

Findings about the relationship between leadership styles of school administrators and mobbing level teachers suffer

Table 4. Correlation analysis about the relationship between leadership styles of school administrators and mobbing level teachers suffer

	1	2	3	4	5	6	7	$\overline{X}$	SS
Autocratic	1							2,92	,679
Democratic	-,517**	1						3,36	,824
Relations with Colleagues	,339**	-,226**	1					1,28	,385
Threat and Harassment	,160**	-,167**	,591**	1				1,06	,212
Barriers about work and career	,380**	-,237**	,573**	,412**	1			1,40	,552

Interference in Private Life	,258**	-,211**	,583**	,527**	,496**	1		1,22	,409
Work commitment	,054	,073	,042	,040	,262**	,125*	1	2,34	1,180

In Table 4, results of correlation analysis as to the relationship between leadership styles of school administrators and mobbing level teachers experience can be seen. According to this, there is a positive relationship between autocratic leadership and relations with colleagues (r=.339, p<.01), threat and harassment (r=.160, p<.01), barriers about work and career (r=.380, p<.01) and interference in private life (r=.258, p<.01).

On the other hand, there is a negative relationship between democratic leadership and relations with colleagues (r= -.226, p<.01), threat and harassment (r= -.167, p<.01), barriers about work and career (r= -.237, p<.01) and interference in private life (r= -.211, p<.01).

However, work commitment dimension of mobbing is seen to have no significant relationship with autocratic (r=.054, p>.05) and democratic (r=.073, p>.05) leadership styles.

Findings about whether leadership styles of school administrators predict the mobbing level teachers suffer

According to Table 5, it is seen that, though at different levels, autocratic leadership predicts all dimensions of mobbing except for work commitment.

Relations with Colleagues

There is a signficant relationship between autocratic leadership and relations with colleagues (R=,339; R²=,115; p<.01). Autocratic leadership accounts for 11,5 % of total variance in relations with colleagues.

Threat and Harassment

There is a very low but signficant relationship between autocratic leadership and threat and harassment (R=,160; R²=,025; p<.01). Autocratic leadership accounts for 2,5 % of total variance in threat and harassment.

Barriers About Work and Career

There is a signficant relationship between autocratic leadership and barriers about work and career (R=,380; R²=,144; p<.01). Autocratic leadership accounts for 14,4 % of total variance in barriers about work and career. Autocratic leadership is seen to have the highest predictive power on barriers about work and career of all other dimensions of mobbing.

Interference in Private Life

There is a low but signficant relationship between autocratic leadership and interference in private life (R=,258; R²=,066; p<.01). Autocratic leadership accounts for 6,6 % of total variance in interference in private life.

Work Commitment

There is no signficant relationship between autocratic leadership and work commitment (R=,054; R²=,003; p>.05).

Table 5. Multiple regression analysis of whether autocratic leadership styles of school administrators predict the mobbing level teachers suffer

Mobbing Variance	Relations with Colleagues				Threat and Harassment				Barriers about work and career				Interference in Private Life				Work commitment			
	B	SH	β	T	B	SH	β	T	B	SH	β	T	B	SH	β	T	B	SH	β	T
Constant	,718	,081	-	8,873	,916	,047	-	19,578	,495	,114	-	4,342	,767	,088	-	8,696	2,066	,263	-	7,864
Autocratic	,192	,027	,339	7,137	,050	,016	,160	3,204	,309	,038	,380	8,147	,155	,029	,258	5,287	,094	,087	,054	1,070
	R=,339		R²=,115		R=,160		R²=,025		R=,380		R²=,144		R=,258		R²=,066		R=,054		R²=,003	
	F(1)=50,939				F(1)=10,268				F(1)=66,379				F(1)=27,951				F(1)=3,378			
	p<.01				p<.01				p<.01				p<.01				p>.05			

Table 6. Multiple regression analysis of whether democratic leadership styles of school administrators predict the mobbing level teachers suffer

Mobbing Variance	Relations with Colleagues				Threat and Harassment				Barriers about work and career				Interference in Private Life				Work commitment			
	B	SH	β	T	B	SH	β	T	B	SH	β	T	B	SH	β	T	B	SH	β	T
Constant	1,635	,080	-	20,555	1,207	,044	-	27,198	1,933	,114	-	16,998	1,574	,085	-	18,566	1,986	,249	-	7,971
Democratic	-,106	,023	-,226	-4,592	-,043	,013	-,167	-3,363	-,159	,033	-,237	-4,828	-,105	,025	-,211	-4,278	,105	,072	,073	1,461
	R=,226		R²=,051		R=,167		R²=,028		R=,237		R²=,056		R=,211		R²=,044		R=,073		R²=,005	
	F(1)=21,090				F(1)=11,307				F(1)=23,313				F(1)=18,298				F(1)=2,134			
	p<.01				p<.01				p<.01				p<.01				p>.05			

According to Table 6, it is seen that, though at low levels, democratic leadership predicts all dimensions of mobbing except for work commitment.

Relations with Colleagues

There is a signficant relationship between democratic leadership and relations with colleagues (R=,226; R²=,051; p<.01). Democratic leadership accounts for 5,1 % of total variance in relations with colleagues.

Threat and Harassment

There is a very low but signficant relationship between democratic leadership and threat and harassment (R=,167; R²=,028; p<.01). Democratic leadership accounts for 2,8 % of total variance in threat and harassment.

Barriers About Work and Career

There is a signficant relationship between democratic leadership and barriers about work and career (R=,237; R²=,056; p<.01). Democratic leadership accounts for 5,6 % of total variance in barriers about work and career.

Interference in Private Life

There is a low but signficant relationship between democratic leadership and interference in private life (R=,211; R²=,044; p<.01). Democratic leadership accounts for 4,4 % of total variance in interference in private life.

Work Commitment

There is no signficant relationship between democratic leadership and work commitment (R=,073; R²=,005; p>.05).

3. Conclusion and Discussion

In this study, the relationship between autocratic and democratic leadership styles of school administrators and the mobbing teachers suffer was examined in different aspects.

In this regard, the answer to the question "Is there a significant difference in mobbing teachers experience in terms of gender?" was found that gender accounts for a significant diference in only "interference in private life" of all five dimensions of mobbing. Male teachers state there is more interference in their private life than the female teachers. It appears interesting though difference inbetween is not so high. It is probable to explain this result through construction process of social gender roles in Turkey, where patriarchy dominates the social structure. Powel and Greenhaus (2010) express that social culture determines the expectations as to in what way men and women as individuals should think and behave, and they add that this structure the society. By this way, boys and girls develop a social gender identity along with gender roles in the social environment they live in (Günay and Bener, 2011). Amaratunga, Haigh and Shanmungan (2006) state in their study that these traditional gender roles specified by the society require the women to engage mostly in domestic responsibilities and to contribute to employment as supplemental labour to men. Employment of women is perceived acceptable only if they are able to perform their traditional gender roles as required. Regarding these roles, educational system has a masculine characteristic. Particularly in a patriarchal society, women undertake domestic works such as houseworks and child care, whereas men has the responsibilities of earning family's keep. Therefore, the man perceived as the householder is accepted as an authority in the family. Based on the role and position of men in the family, women can be thought to perceive their administrators as an authority in their business life and thus not to take their administrators' words and behaviours as an interference in their private life. Similarly at school, female teachers may see such behaviours as what their principals should do normally.

The answer to the second question "Is there a significant difference in mobbing teachers experience in terms of seniority?" was found that seniority accounts for a significant difference in "barriers about work and career" and "work commitment" dimensions of mobbing. In barriers about work and career dimension, teachers of 0−5 years seniority are seen to suffer mobbing more than of 21 years or over seniority. When considered that teachers of 0−5 years seniority experience mobbing the most of all other seniority groups, it can be said that newly appointed teachers are the ones who face barriers most. Teachers suffer inexperience in all aspects in early years of teaching and thus, compared to other senior teachers, they need to show more effort both educational activities and relationships with students and administrators. Moreover, the fact that teachers are inexperienced in their early years of teaching leads them to feel burnout especially when they

cannot get enough guidance they need from their administrators (Inandi, 2009). On the other hand, it is observed that shool administrators exploit these teachers' inexperience rather than guiding and supporting them. Similar results were found in Erdemir (2007) and Sarı and Altun's (2015) studies. They express that school administrators do not help newly appointed teachers but treat them as "administrating prosecutor". There is also a significant difference between teachers of 6–10 years seniority and 21 years or over seniority in terms of work commitment. Teachers of 21 years or over are seen to have work commitment more than of 6–10 years. It is not rational to expect a high level of work commitment from teachers of 6–10 years seniority as they are also in the early years of professional life and might as well face barriers. Durna and Eren (2005) found out in their study conducted with a mixed group of educaion and medical staff that commitment of teachers and medical staff gets higher in direct proportion to their age and seniority. This result parallels with Suliman and Iles' (2000) study. In accordance with age and seniority, compatibility between individual and organizational values improves and the invest people have in their job and organization mounts up. It seems quite natural that people who do not want to give up the investment have high commitment. Gündoğan (2009) also revealed that workers of 0–10 years seniority have weaker emotional commitment than of 21 years or over. Seyhan (2014) showed that workers of 21 years or over seniority have generally higher organizational commitment than other staff. Regarding that seniority improves in line with age in educational organizations, this result is supported by Marshall, Lassk and Moncrief' (2004) findings that age is determinant on work commitment. In contrast to these studies, Topaloğlu, Koç and Yavuz (2008) showed in their study that teachers of 0–5 years seniority have higher organizational commitment than other seniority groups. However, it is also seen in the same study that organizational commitment of teachers start to rise after 16 years, which suports the research results above. With reference to these results in the administrational area, the fact that newly appointed teachers must be supported and motivated by their administrators will result in positive outcomes such as high level of school success, increase in teachers' motivation and decline in misbehaviours of students.

The answer to the third question "Is there a significant relationship between leadership styles (democratic and autocratic) of school administrators and mobbing teachers experience?" was found that a positive relationship is observed between autocratic leadership and all dimensions of mobbing except for work commitment while there is a negative relationship between democratic leadership and all dimensions of mobbing except for work commitment. In other words, teachers state that they suffer mobbing more as their school administrators show autocratic behaviours but they experience mobbing less under democratic leadership. The positive relationship between autocratic leadership and mobbing is particularly supported by the researches in the area (Shahbazi et al., 2013; Ertüreten et al., 2013; O'Moore, Lynch, 2007). It is a fact that administrators who adopt autocratic leadership style try to maintain strict, hierarchial structure of the organization, make decisions by himself and prioritize the work rather than workers. Therefore, it is quite likely that he creates barriers for workers, threatens and harasses them to finish the work, have negative effect on relations between colleagues and interfere in their private life. Vartia (1996) indicates that autocratic leadership causes mobbing and other problems withn the organization while democratic leadership contributes to equality and balance within the organization. It is observed in the study by Vugt and his friends (2004) that, in the organizations where autocratic leadership is exhibited, workers tend to leave their work regardless of all other advantages. On the other hand, Woods (2004) states that democratic leadership encourages workers to participate in decision making, requires respect to others and offers everybody right to actualise their expectations. Telli, Ünsar and Oğuzhan (2012) revealed in their study that autocratic leadership increases burnout and has effect on tendency to leave of employment. School administrators with democratic leadership, on the contrary, helps workers have higher job satisfaction, organizational commitment, organizational citizenship and contributes to a more positive organizational culture. If the individual feels happy in his organizaiton, turnover, burnout and reluctance to work will be observed less, which will influence the educational organizaitons positively in all aspects.

The answer to the last question "To what extent do leadership styles (democratic and autocratic) of school administrators predict the mobbing teachers experience?" was found that autocratic and democratic leadership styles of school administrators predict all dimensions of the mobbing teachers suffer except for work commitment though at different rates. There is no doubt that there are numerous reasons for the mobbing teachers suffer. Leadership style of the school

administrator is one of them. In this regard, it can be seen that autocratic leadership considerably predicts the dimensions of "barriers about work and career" and "relations with colleagues". That's because workers would like a comfortable, peaceful and secure workplace. In context of autocratic leadership, it is inevitable that the administrator does not trust the workers or participate them in decision making, always watches and inspects them. Such a pressure leads the workers to suffer mobbing though they mostly do not realize it. Hoel and his friends (2010) also revealed that autocratic leadership has a predictive power on mobbing. However, it is seen that democratic leadership does not predict mobbing as high as autocratic leadership. Examining the other leadership styles (transformational and transactional), Daşçı and Cemaloğlu (2015) found out that leadership styles of school administrators are determinant on the mobbing teachers experience. They put emphasis that "a leadership style in which moral values are attached importance" is needed. Therefore, the democratic leadership style examined in this study is of great importance to meet the need mentioned above.

In conclusion, male teachers think that they suffer mobbing more than female teachers. School administrators need to adopt democratic understanding of administration which makes much of human relations. It seems beneficial that school administrators get training about democratic administration at convenience of the ministry and administrators.

It is also understood that teachers suffer mobbing in their early years of teaching. The school administrators, counselors and advisor teachers need to assist them at this period. A programme about this problem can be initiated covering all the school in the country.

As democratic leadership is adopted, mobbing is less observed, and vice versa with autocratic leadership. Therefore, the ministry must provide school administrators with in-service trainings for human-driven understanding of administration.

The relationship between leadership styles (autocratic and democratic) of school administrators and mobbing teachers suffer is examined in this study. The researchers can investigate the relationship between other leadership styles and mobbing. Moreover, the relationship between leadership styles and organizaitonal alienation can be studied.

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Factors that Explain the Attitude Towards Statistic in High-School Students: Empirical Evidence at Technological Study Center of the Sea in Veracruz, Mexico

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Abstract

The aim of this paper was to analyze attitude towards Statistics in high-school students using the SATS scale designed by Auzmendi (1992). The sample was 200 students from the sixth semester of the afternoon shift, who were enrolled in technical careers from the Technological Study Center of the Sea (Centro de Estudios Tecnológicos del Mar 07 CETMAR 07, for its acronym in Spanish) in Veracruz, México. The participants were selected using a non-random sampling by convenience. The procedure followed was the statistical exploratory factorial analysis by García-Santillán, Venegas-Martínez and Escalera-Chávez (2013), while the data analysis was made using the SPSS Statistics 19 software to analysis the information. The results provide significant evidence to ascertain that there is a component which explains the attitude towards Statistic of high-school students and it has three dimensions: liking, confidence and usefulness. The former leads us to think that there is a factor with an affective, a behavioral and a cognitive part. Hence, the affective component is present when they like working with Statistics; confidence is a behavioral component associated with the disposition and security a subject has when facing Statistic and finally, usefulness as a cognitive component involving beliefs, that is to say, the value a student places on the knowledge of Statistic.

Keywords: Student´s attitudes, high-school students, attitude towards Statistic.

1. Introduction

The phenomenon of academic performance in Mathematics has been a concern for governments and institutions around the world, as it has been the case in the Organization for Economic Cooperation and development (OECD), which has the Program for International Student Assessment (PISA), aimed to measure the performance in Mathematics, Reading and Sciences of 15 year old middle high-school students. In Mexico, the Secretary of Public Education (SEP for its

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acronym in Spanish) has implemented the program National Evaluation of Academic Performance in School Centers (ENLACE for its acronym in Spanish), which is a test applied in elementary and middle-school, measuring Reading comprehension and Mathematics of students enrolled in senior year.

Regarding Mathematics performance, the 2012 PISA test shows critical data, both in Mexico and in the state of Veracruz, since more than half of the surveyed students are below level 2 in a scale from 1 to 6. It is important to mention that men achieve higher scores than women and there are not differences between public and private schools; also, the scores of concern and anxiety are equally worrisome since Mexico reports the highest score among the OECD countries and women present higher anxiety than men (OCDE, 2013; INEE, 2013), as shown in Table 1.

Similarly, the results of the 2013 ENLACE tests applied to senior year students (see Table 2) show that more than half of the students are in the Elemental or Insufficient levels of Mathematics performance (SEP, 2013).

Considering the above, the results from the PISA and ENLACE tests are a reflection of a critical situation existing in the Mathematics education of Mexican students, despite the fact that performance scores in the subject showed an upwards tendency in 2012 and 2013 respectively.

Table 1. Pisa 2012 Results in Mexico

Indicators	Data	Comparison
Average performance	Mexico = 413 points	OCDE = 494 Latin America (LA) = 397
Placement	Mexico = Last place of the 34 OECD countries	Above LA average, Argentina, Brazil, Colombia and Peru. Underneath: Chile
High performance levels (4, 5 y 6)	Mexico = 4 % of the surveyed students	OECD = 31 % LA = 4%
Low performance levels (below 2)	Mexico = 55 % of the surveyed students	OCDE = 23 % LA = 63 %
High performance levels by federation entity	Veracruz = 3 % of the surveyed students	8 % = Aguascalientes, Nuevo Leon, Queretaro and Chihuahua
Low performance levels by federation entity	Veracruz = 61 % of the surveyed students	70 or more= Tabasco, Chiapas y Guerrero
Mathematics performance by Gender	Mexico = Men achieve highest scores than women	
Mathematics performance by school type	Mexico = students from private schools do not achieve a higher performance than the ones from public schools	
Concern for difficulties in Mathematics classes	Mexico = More than 75 % of students	Mexico has the highest score of anxiety among the OECD countries
Anxiety when facing Mathematics problems	Mexico = Approx. 50 % of students	Mexico has the highest score of anxiety among the OECD countries
Anxiety towards Mathematics by Gender	Mexico = Women report a higher anxiety level than men with the same performance	

Source: elaborated with data from OECD (2013) and INEE (2013)

Table 2. ENLACE 2008-2013 Test Results

Indicators	National		State (Veracruz)	
	2008	2013	2008	2013
Performance levels Excellent and Good	15.6 %	36.3 %	14.2 %	37.8 %
Performance levels Elementary and Insufficient	84.4 %	63.7 %	85.8 %	62.2 %

Source: Elaborated with data from SEP (2013)

Consequently, considering that Statistic belongs to the Mathematics field, it can be stated that by association, its learning process faces the same problem that was stated before and gains relevance being a science that supports other knowledge areas such as Marketing, Accounting, Quality Control, Education, Politics, Medicine, Research and it is definitely of interest for decision making (Ruiz, 2004). Furthermore, this science is now known as "statistical literacy", that is, a statistical culture, understood as an inherent knowledge of the common citizen, regardless of his/her career, social class or educational level. The importance of Statistics is such that there are international organizations and initiatives focused on Statistical education, for instance, the International Association for Statistical Education (IASE) (Estrada, 2002).

The learning of Statistics goes beyond a mere knowledge; viewed from a systemic approach, this involves the integration of a student´s skills, disposition and competence, both as a data creator and interpreter (Gal y Garfield, 1997). In addition, there are other determinant factors such as previous experiences in class, notions acquired outside the classroom and the transference of attitudes from Mathematics to the field of Statistics (Ferreyra, n.d.). Hence, we must considerer that besides transmitting knowledge in the classroom, attitudes are also taught by teachers (Estrada, 2001).

Furthermore, research accounts for the influence of cognitive and non-cognitive factors, among which are attitudes, beliefs, feelings, emotions, interests and expectations (Gal y Ginsburg, 1994 quoted by Ferreyra, n.d.). Even though these terms are implied in each other, attitude stands out as the most encompassing one, being an object of study in Psychology and for which, there is not a consensus regarding its definition.

After reviewing the scientific literature on the subject, two seminal contributions quoted by Estrada (2001) were chosen in this work: on one hand, the broad definition of attitude by Rokeach (1968) as "an organization of several beliefs focused on a specific object or situation, predisposing one to respond in some preferential manner" (p. 371) and on the other hand, the definition by Auzmendi (1992), which is focused on Mathematics and Statistics, conceives attitudes as "aspects that are not directly observable but inferred, made up by beliefs and feelings as well as behavioral predispositions towards the directed object" (p. 372).

So, it can be stated that attitudes are determined by three components: cognitive, affective and behavioral (Darias, 2000) and three elements are identified in the measuring of attitudes: a) the relation subject-object, in this case, student-Statistic; b) the object evaluation by the subject in a cognitive and affective manner; and c) the predisposition of acting in a determined way as a result of the evaluation, involving a behavioral part (García, 2002).

The cognitive component involves the beliefs, that is to say, how objects, people and situations are conceived and perceived; the affective component refers to the feeling of liking and disliking that the object, person or situation causes; and the behavioral is the disposition of reacting in a determined way towards the object, person or situation, as a latent behavioral tendency (Méndez y Macía, 2007).

In the educational field, it is important to know the attitudes of the students towards Statistic, as well as their relationship with statistic performance (Stijn et al., 2006), even more when this subject is referred to as sadistic by the students of Anglo-Saxon universities (Rosenthal, 1992 quoted in Carmona, 2004); hence, Dillon (1982) "has even labeled those students´ feelings as statisticophobia" (Carmona, 2004: 6).

This is the context where a significant research line has been developed around attitude as an influential factor in student´s performance, as one of the two most important subjects in the

educational research field, together with learning environment (Mvududu, 2003). Attitude has in McLeod (1992) a relevant author, since his work between 1988 and 1994 "largely contributed to recognize the importance of affective matters and explain the differential effects of attitude predispositions in teaching-learning processes of Mathematics, and therefore, Statistic" (Estrada, 2002: 50).

In scientific literature there are papers addressing the state of the art on research about students´ attitude towards Statistic and the studies that stand out are the works of Estrada (2001, 2002), who analyzes the characteristics of the studies made on the subject, such as population, variables and scales; Carmona (2004) focuses on the evidence of reliability and validity of several instruments and Blanco (2008) accounts the empirical research in Spain and Anglo-Saxon countries. It can be seen that, even though Statistic is as old as writing (Ruiz, 2004), the research on the education of this subject is considered emerging (Estrada, 2002) since it started in the United States in the decade of 1980 (Blanco, 2008) and in the case of Mexico, it was rated as limited by the Mexican Committee of Educational Research (COMIE for its acronym in Spanish) in the year 2002 (Ferreyra, n.d.).

To measure the attitudes toward Statistic, the most used technique has been the scale, for its advantage as an objective instrument to determine differences of liking and intensity regarding a subject and also, the Likert type scale is the most common because it focuses on the subjects (Estrada, 2001). Based on this assumption, there are several measuring instruments used in empirical research, from the seminal work by Roberts and Bilderback (1980) and Wise (1985), whose instruments are the most used, to Auzmendi (1992) and Velandrino and Parodi (1999) who designed instruments in the Spanish language (Carmona, 2004; Estrada, 2001).

Among the studies about attitude towards Statistic, Estrada (2002) mentions the work of Elmore and Vasu (1980, 1986); Garfield (1981); Harvey, Plake and Wise (1988); Schau and colab. (1995); Wilensky (1995, 1997); Silva and colab. (1999); Gil Flores (1999) and Mastracci (2000). On the other hand, Ferreyra (n.d.) identifies the research by Aparicio, Bazán and Abdounur (2004) in Peru; Méndez and Macía (2007) in Chile and Silva, Ferreira, Cazorla and Vendramini (2002) in Brazil.

In addition, there are the studies of Rodríguez (2011) in Argentina; Ferreyra and Organista (n.d.) in México; Vanhoof, Castro, Onghema, Verschaffel, Van Dooren and Van Den (2006) in Belgium; and Mondéjar, Vargas and Bayot (2008) in Spain.

This paper uses the Auzmendi (1992) scale called Scale of Attitudes toward Statistic (SATS) because it is the first instrument known to be designed in Spanish, it is also applicable to high-school students (Estrada, 2001) and it is the most commonly used instrument in Spanish (Carmona, 2004).

The former scales considers five dimensions: 1) usefulness, related to the value a student gives to Statistic; 2) anxiety or fear towards this subject; 3) confidence, as security the subject has when facing Statistic; 4) liking or enjoyment caused by working with Statistic and 5) motivation for the use and study of the subject (Carmona, 2004; Méndez y Macía, 2007).

The SATS scale by Auzmendi has been applied and validated by several researchers internationally, for instance, in Spain there is empirical evidence from Darias (2000) and Tejero and Castro (2011); in Chile from Méndez and Macía (2007) and in Mexico, applications were scarce barely six years ago (Méndez y Macía, 2007), however, interest has risen, as shown by the studies of García, Moreno, Carlos, Zamudio and Garduño (2012); Escalera, García and Venegas (2013); García, Venegas and Escalera (2013) and García, Venegas, Escalera and Córdova (2013). It should be noted that the studies hereby mentioned have targeted college students and no empirical research was found in Mexico regarding the application of attitude towards Statics scales in high-school students.

1.1. Research questions, objectives and hypothesis

Considering the object of study formerly described, it is necessary to know the students´ attitudes first so that performance can be measured, the following questions are posed:

1.- Which is the attitude toward statistic in high-school students of the "Centro de Estudios Tecnológicos del Mar No. 7 (Technological Study Center of the Sea #7) in Veracruz, México.

2.- Which are the dimensions that explain high-school students´ attitude towards Statistic?

In order to respond such questions, the present study aims to analyze the CETMAR 07 high-school students´ attitude towards Statistic based on the factorial structure of the SATS Auzmendi scale. Therefore, based on the hypothesis stated by García-Santillán et al (2013), this study seeks to prove if:

Null Hypothesis HO1: There are no factors that explain the students' attitude towards statistic in high school students in the CETMAR 07.

Alternative Hypothesis HA1: There are factors that explain the students' attitude towards statistic in high school students in the CETMAR 07.

A particular way, the sub hypotheses are:

H1: Motivations is the factor that most explain the variance of model

H2: Liking is the factor that most explain the variance of model

H3: Confidence is the factor that most explain the variance of model

H4: Usefulness is the factor that most explain the variance of model

H5: Anxiety is the factor that most explain the variance of model

1.2. Model of Analysis
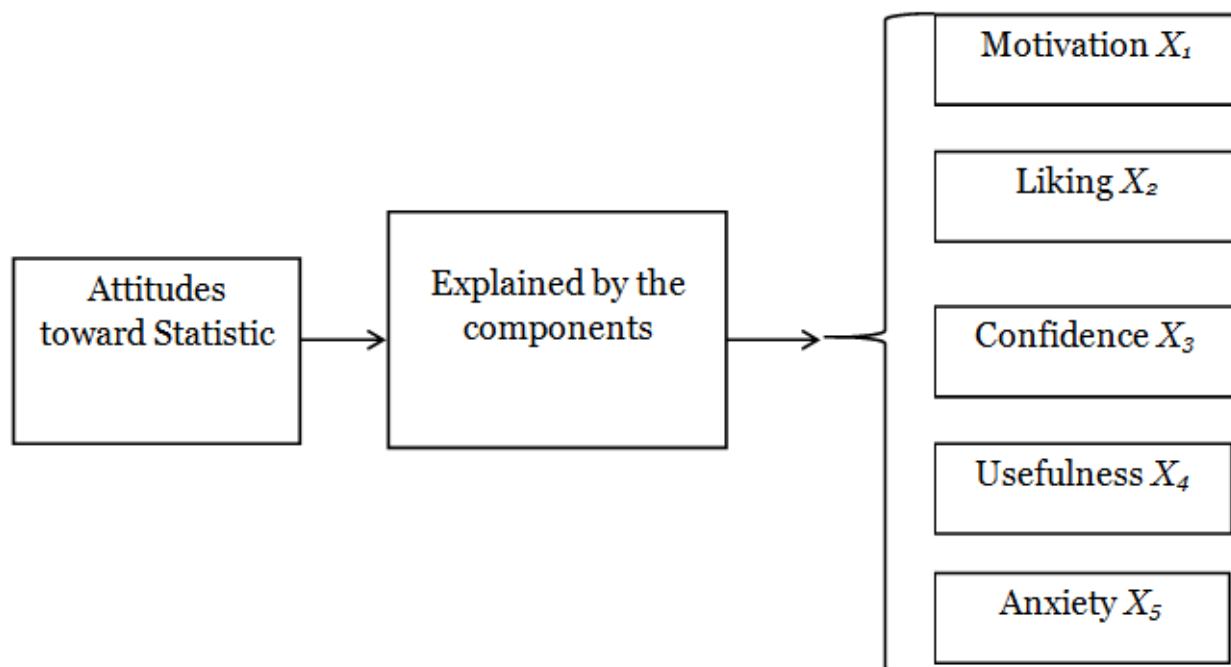
Source: own

2. Methodology
2.1. Research design:

This study was non experimental, ex post facto and transversal cut. The instrument was applied in the classroom of the participants towards the end of the school cycle August-December, 2013 to ensure that the subjects were qualified to answer the questions. The questionnaire was anonymous and the instructions were previously explained. This was a transversal cut study considering it took place in a single time, both the recollection of data from the instrument application and the analysis and interpretation of the results. The study is also explicative since it aimed to measure the student´s attitude toward Statistic from the variables of the scale proposed by Auzmendi (1992).

2.2. Study Population:

The sample size included 200 students, 48 % male and 52 % female from the sixth semester of the afternoon shift (see Table 3) of the Technological Study Center of the Sea (CETMAR 07) in Veracruz, Mexico. The students were enrolled in the following technical careers:

- Port Operation
- Food and Beverage Preparation
- Maritime Water Aquiculture
- Naval Construction and Repair
- Refrigeration and Air-Conditioning

They were selected by a non-random sampling by convenient, based on two inclusion criteria: Access availability and taking the subject Statistic. From a quantitative approach and for a set design, the usefulness of a non-probabilistic sample resides not in the "representativeness" of elements, but in a careful and controlled choosing of the subjects with certain characteristics that were previously defined in the problem statement. It is important to note that the study was carried out at the request of the campus authorities in certain groups of students. Hence, the sample was for convenience. As a result, 200 students were surveyed, 96 women (48 %) and 104 men (52 %) and the data was later collected and analyzed with the SPSS (Statistical Package for Social Science) v.16 software.

2.3. Instrument

The SATS scale of Auzmendi considers five dimensions which comprise five items each one (25 items), as shown in Table 3. The scale it's a Likert type with five response options (Darias, 2000):

Table 3. Dimensions of the Attitude towards Statistics Scale

Dimension	Item
Usefulness	1, 6, 11, 16, 21
Anxiety	2, 7, 12, 17, 22
Confidence	3, 8, 13, 18, 23
Liking	4, 9, 14, 19, 24
Motivation	5, 10, 15, 20, 25

Source: elaborated based on the Auzmendi (1992) scale

Response options: Strongly disagree (1), Disagree (2), Neutral (3), Agree (4) and strongly agree (5).

Regarding the reliability, several studies report high internal consistency scores in terms of Cronbach´s alpha coefficient, for example 0.90 in Darias (2000); 0.85 in Méndez & Macía (2007); 0.87 in Tejero & Castro (2011); all above 0.80, a recommended value as the minimum acceptable (Hair, 1998). The author reports that the instrument can explain a 60.7 % of the total variance, extracting the dimensions by means of a main components factorial analysis with varimax rotation (Carmona, 2004; Tejero y Castro, 2011).

In order to validate the Auzmendi (1992) scale, Carmona (2004) correlated the instrument with the Statistics Attitude Survey (SAS) of Roberts and Bilderback (1980) and got a value of 0.86 among both instruments, "which shows that it effectively measures the construct of attitudes toward Statistic. With the analog procedure it confirms the multidimensional validity of the different subscales" (Estrada, 2001: 380).

2.4. Statistic procedure

For the evaluation and interpretation of the data collected by the instrument, we follow the procedure by García-Santillán, Venegas-Martínez and Escalera-Chávez (2013), García-Santillán, Rojas-Kramer, Moreno-García, and Ramos-Hernández (2017), Navarro-Ibarra, García-Santillán, Cuevas-Salazar, Ansaldo-Leyva (2017), García-Santillán (2017). Who carried out the statistic procedure Multivariate Exploratory Factorial Analysis to measure the attitude toward Mathematics

by replicating the Auzmendi (1992) scale, as well, other scales that measure similar phenomenon of study, such as, RMARS scale of Richardson and Suinn (cited in Navarro-Ibarra et al., 2017).

Therefore, to prove the hypothesis, the following criterion is established: Ho: ρ=0 there is no correlation and Hi: ρ≠0 there is correlation. Hence, the test statistics are: $\chi 2$ and the Bartlett´s test of Sphericity KMO (*Kaiser-Meyer_Olkin*) and the value of the Measure of sample adequacy (MSA) for each variable. Under the null hypothesis, this test statistic is asymptotically distributed by an $\chi 2$ distribution with *p(p-1)/2* degrees of freedom, with a significance level: α= p<0.01 or <0.05, the practical significance of the factorial loading of 0.70 and the statistic establishes loadings higher than 0.55.

Hence, if Ho is true, the own values are one and its logarithm is null, so the test statistic is zero and on the contrary, Bartlett´s test with high values of $\chi 2$ and a low determinant would suggest that there is a high correlation. Considering this, if the critical value: computed $\chi 2$ > tables $\chi 2$, there is evidence for the rejection *Ho* and the decision rule is: Reject Ho if computed $\chi 2$ > tables $\chi 2$, otherwise do not reject.

3. Data analysis and discussion
3.1. Test validation
Before the discussion of the results obtained by means of the SPSS Statistics 19 software, we proceed to analyze the reliability of the applied instrument and its responses with the Cronbach´s alpha coefficient, which measures the internal consistency of the scale and its reliability, that is to say, the homogeneity of the questions, by getting the average of the correlations between all items, from where we can determine the degree in which equal results are obtained by repeatedly applying the instrument to the same subject.

Consequently, said coefficient verifies the quality of the collected data and ensures that the discussion of the results is based in stable and consistent measurements. The more abundant, the reliability analysis is a square correlation coefficient that considers values between 0 and 1, so that the more the value is closer to 1, the higher the reliability; in that sense, Hair (1998) states that a value >0.6 can be accepted even when a respectable reliability is considered from 0.80. Therefore, for the calculation the following formula is applied:

$$\alpha = \frac{N * \overline{r}}{1 + (N - 1) * \overline{r}}$$

Where:
N = Number of items (or latent variables), $\overline{r}$ = is the medium correlation between the items. The following table shows the results of the 200 studied cases:

Table 4. Cronbach´s alpha reliability statistic tests

Cronbach´s alpha	N of cases	%	Alpha
Valid cases	200	100.0	α= 0.621
Excluded(a)	0	.0	
Total	200	100.0	25 elements
Grouped	Usefulness Anxiety Confidence Liking Motivation		α= 0.218

5 elements |

a. Elimination based on all the variables of the procedure.
Source: own

As it can be seen in Table 5, the obtained alpha of 0.621 (extended) is acceptable, even when it barely surpasses the theoretical value suggested by the >0.6 criterion (Hair, 1998); thus, it can be stated that the test is valid regarding the consistency and reliability of the instrument.

In order to achieve a higher confidence about the reliability of the applied instrument, Guttman test was applied and the results are shown on Table 5.

Table 5. Guttman reliability

Lambda	1	.596
	2	.692
	3	.621
	4	.682
	5	.642
	6	.764
Number of elements		25

Source: own

Reading the former table, the reliability of the instrument is reasserted because for the 25 analyzed elements, the statistic reports Lambda values between 0.596 y 0.764, meaning that all are above.5

3.2. Data analysis
First, some parameters are evaluated to see if it is considered convenient or not to make this kind of test; for that, the correlation matrix of Pearson, the Kaiser-Meyer-Olkin test and the Bartlett´s test of Sphericity are valued. Table 6 shows the matrix of correlations between variables, where a representative group of variables has a correlation higher than 0.25 (70 %). It can be seen that there is a positive relation between usefulness and liking (r=.542), while there is a negative relation between anxiety and confidence (r =. 486), that is to say, the lower the confidence, the higher the anxiety.

Table 6. Correlation matrix

Variables	Usefulness	Anxiety	Confidence	Liking	Motivation
Usefulness	1.000	-.118	.428	**.542**	.079
Anxiety		1.000	**-.486**	-.232	.264
Confidence			1.000	.359	-.032
Liking				1.000	-.115
Motivation					1.000

Source: own

Table 7 shows Bartlett´s statistic and the MSA (Measure of Sample Adequacy) values, which corroborate the correlation pattern. It can be seen that the KMO value is an accepted one (0.586) since it is higher than 0.500, as recommended by Hair (1998) and the Bartlett´s test of Sphericity value (α =0.00) is lower than 0.05.

Table 7. KMO values and Bartlett´s test of Sphericity

Kaiser-Meyer-Olkin measure of sample adequacy.		.586
Bartlett´s test of Sphericity	Chi-square approximate	195.336
	df	10
	Sig.	.000

Source: own

The Measure of Sample Adequacy values are shown on Table 8 and it is possible to see that of the five constructs, one presents values under 0.5, so the variable with lower value is removed and the analysis is run again since all the constructs must have values above 0.5.

Table 8. Anti-image matrix

Variables	Usefulness	Anxiety	Confidence	Liking	Motivation
Usefulness	**.573ᵃ**	-.124	-.322	-.483	-.135
Anxiety		**.543ᵃ**	.472	.096	-.258
Confidence			**.616ᵃ**	-.092	-.085
Liking				**.642ᵃ**	.148
Motivation				.	**.443ᵃ**

Source: own

Table 9 shows the correlation matrix once the motivation construct is removed and the variables with more correlation are still usefulness and liking (r =.542). The set of variables reaches an acceptable value for the Measure of Sample Adequacy (0.599), the sphericity test is significant and the anti-image matrix values are all above 0.500 (Table 9).

Table 9. Correlation matrix and anti-image matrix values

	Correlation matrix			
Variables	Usefulness	Anxiety	Confidence	Liking
Usefulness	1.000			
Anxiety	-.118	1.000		
Confidence	.428	-.486	1.000	
Liking	.542	-.232	.359	1.000
	Anti-image matrix values			
	.573ᵃ	.533ᵃ	.618ᵃ	.656ᵃ
Kaiser-Meyer-Olkin measure of sample adequacy.			0.599	
Bartlett´s test of sphericity			173.405	
Significance			0.000	

Source: own

All the measures indicate that factorial analysis is suiting, for that reason, the component matrix is valued and applying the latent root criterion. As we can see in Table 5 there is only one component, which represents 52.58 % of the total variance of the four constructs.

Also, Table 10 shows that three of the constructs: usefulness, confidence and liking have positive charges and one of them, anxiety, has a negative charge (-0.590). The value of the Communalities demonstrates that the construct with higher variance is confidence (.633).

Table 10. Component and extraction of component factor matrix

Component matrix		
Variables	Component 1	**C**ommunalities
Usefulness	.744	.553
Anxiety	-.590	.348
Confidence	.796	.633
Liking	.751	.564

Component extraction		
Eigenvalue	% variance	% accumulated variance
2.099	52.480	52.480

Source: own

4. Conclusions

The results of this research provide significant evidence to ascertain that there is a tridimensional component that explains attitude of high-school students towards Statistic: usefulness, liking and confidence with a factorial loading of 0.744, 0.751 and 0.796 respectively.

However anxiety shows negative charge (-0.590), which leads us to believe that anxiety decreases when the student feels liking, usefulness and confidence toward statistic.

The dimension *liking* is an affective component related to the feeling of liking and disliking, which is understood as the enjoyment of working in Statistics; the dimension confidence is a behavioral component regarding the disposition of reacting in a certain way, and in general terms it is the confidence the subject has when facing Statistics; finally, the usefulness dimension is a cognitive component involving beliefs, understood as the value the student places on the knowledge of Statistics.

The liking and confidence dimensions concur with the results found in the studies of Méndez & Macía (2007); Tejero & Castro (2011); Darias (2000); García-Santillán, Moreno-García, Carlos, Zamudio & Garduño (2012); García-Santillán, Venegas-Martínez & Escalera-Chávez (2013); García-Santillán, Venegas-Martínez, Escalera-Chávez & Córdova-Rangel (2013).

Besides the former studies, the usefulness dimension coincides with the findings of Mondéjar, Vargas y Bayot (2008).

As it can be seen in the findings of this study, the three components of attitude, which have an impact on learning, are present: the cognitive, affective and behavioral, related to usefulness, liking and confidence, respectively. The former, allows to suggest that when high-school students of *Centro de Estudios Tecnológicos del Mar* (Technological Study Center of the Sea) in Veracruz, México. CETMAR 07 perceive the usefulness of the Statistics applications, the liking for the subject increases and when self-confidence decreases when facing Statistics, then anxiety increases.

Hence, it is important that academic authorities of said institution promote learning strategies that involve the approach of students to real cases and experiences of professionals, where they can appreciate the application of Statistics and its positive impact in decision making. Also, we recommend the implementation of simulation practices where the student can face situations that can be analyzed and/or resolved by using Statistics and so, he/she can gain confidence regarding this subject.

Finally we can see that the null hypothesis HO1 it's rejected in terms of $\chi2_c > \chi2_t$, accepting the alternative hypothesis HA1, since it was shown that there are factors that explain students' attitude towards statistic in high school students in the CETMAR 07.

Also, we can see a particular way, that the sub hypotheses:

H1: Motivations is the factor that most explain the variance of model
H2: Liking is the factor that most explain the variance of model
H3: Confidence is the factor that most explain the variance of model
H4: Usefulness is the factor that most explain the variance of model
H5: Anxiety is the factor that most explain the variance of model

The result shows evidence that confidence is the factor that most explain the variance of the model, following of liking and usefulness, therefore the sub-hypothesis H3, H2 and H4 are accepted.

One of the frequent limitations of this type of study is the sample size; hence we suggested continuing the study, integrating as many cases as possible. With this action, more empirical evidence could be obtained to identify the factor or factors that most explain the scale used.

As a future line of research, we suggest extending the study to other universities, especially in those majoring that include mathematics in their curriculum.

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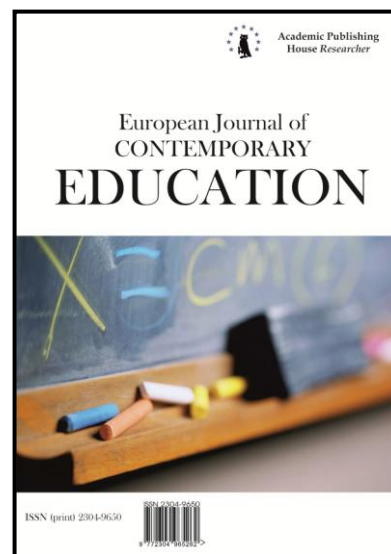
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Organization and Carrying out the Educational Experiment and Statistical Analysis of its Results in IHL

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Abstract

The article discusses the methodological approach to the technology of the educational experiment performance, the ways of the research data processing by means of research methods and methods of mathematical statistics. The article shows the integrated use of some effective approaches to the training of the students majoring in «Technological education». The purpose of article is to check the efficiency of the created didactic support that helps to ground the students majoring in «Technological education» in the technologies of modern production at the university. It shows the features of introduction of the created didactic set of the hi-tech educational laboratory equipment based on digital technologies with program control into the educational process. The materials of the article can be useful to university lecturers, school teachers (teachers of Physics, Mathematics, Technology etc.) and students of teachers training and technical institutions, colleges, schools.

Keywords: educational experiments, methods of mathematical statistics, students majoring in «Technological education», didactic set as learning aid.

1. Introduction

Educational experiment is a complex, time-consuming method of scientific psychoeducational research, it is carried out for the purpose to check the suggested hypothesis and assumes the solution of a certain set of tasks.

Psychoeducational experiment is a complex research method which provides the scientifically based and evidential check of the correctness of the hypothesis suggested at the beginning of the research. The essence of the experiment consists in the active researcher's intervention in the psychoeducational process with the purpose to study it in the planned parameters and conditions (Obraztzov, 2004).

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It is based on the comparison of the control and experimental groups and registration of the corresponding changes in the behavior of the studied object or system.

A set of statistical data on characteristics and properties of the studied objects which serves as a criterion of the validity of the scientific hypotheses, theoretical conclusions and operational recommendations is a result of any educational experiment.

Up to the end of the XIX century scientists considered the use of logical conclusions to be sufficient for the establishment of the validity of the solutions of many pedagogical problems. Modern pedagogics demands the scientific validity of all the hypotheses. This means that the educational experiment performance, the control of independent variables (which are considered to be the possible reasons of the changes of dependent variables) and dependent variables (which are considered to be the possible consequences of the factors of independent variables) and also the application of modern methods of mathematical statistics to prove the importance of the elicited facts are necessary.

2. Literature Review

Many authors devoted their works to educational experiments: Avanesov, 1989; Babansky, Zhuravlev, Rozov, 1988; Bespalko, Tatur, 1989; Bobrovskaya, 2015; Grabar, Krasnyanskaya, 1977; Zhuravlev, Novikov, Skatkin, Piskunov, 1979; Zagvyazinsky, 1993; Morozov, Pidkasisty, 1991; Naumkin, Grosheva, 2010; Naumkin, 2013; Novikov, 1998; Obraztsov, 2004; Osintseva, 2005; Slastenin, Podymov, 1997; Tynnikov, 2015; Tyunnikov, 2016. They describe the tasks facing the researchers conducting educational experiments, the factors influencing the research procedures and give some recommendations that can help to plan and process the received results, etc. Despite a large number of the works devoted to the questions mentioned above, many beginning researchers experience some difficulties in their studies. The questions of the correct planning of their experiments, the possibilities of their realization, the right definition of the values of the studied variables, the choice of techniques for objective and reliable processing of the experimental results, the possibilities of their exact interpretation, etc. worry them. This can be explained by the fact that:

1) the majority of the mentioned above scientists' works regarded as classic in pedagogics and psychology have sections devoted to experimental pedagogics and as a rule they are written in high academic style (there are few examples from practice);

2) in the works the scientists consider some separately taken sections of experimental pedagogics (for example, logic of educational researches, methods of pilot study, methods of mathematical statistics, etc.).

All this allows to draw a conclusion about the difficulties the students face to connect theory with practice while conducting educational pilot studies. Therefore the objective of the given research is to work out the techniques of organization and carrying out educational experiments, and mathematical processing of the results for the students of the Faculties of Technology and Business, Technology and Economics, Mathematics, Informatics and Natural Sciences, Major stream «Pedagogical Education» in IHL.

3. Materials and methods

The purpose of the educational pilot study is to check the efficiency of the created teachware for teaching students majoring in «Technological education» to the bases of the technologies of modern production (to electrophysical and electrochemical methods of processing of materials in particular).

The educational experiment was preceded by the students' formation of knowledge, skills while studying the electrophysical and electrochemical methods of processing of materials. Also the whole complex of didactic teachware was created: the course program «Bases of Electrophysical and Electrochemical Methods of Processing of Materials», the lecture course «Bases of Electrophysical and Electrochemical Methods of Processing of Materials» (Sidorov, 2016), the set of educational and laboratory installations on electrospark (Sidorov et al., 2010), high-frequency electrospark processing (Sidorov et al., 2011), processing of materials and metal hardening by currents of high frequency (Sidorov et al., 2010) was designed and made; the methodical recommendations for conducting laboratory workshops on processing of materials by methods of electrospark, high-frequency

electrospark processing and metal hardening by currents of high frequency; the educational tests for determination of the level of mastering the basic concepts of the course.

The main documents while at assessing the level of the students' knowledge and abilities before and after the introduction of the new components of the educational process into the educational experiment were: payrolls of the groups (control and experimental ones), educational tests, contents of the students' answers while studying the course and protocols of their analysis. The actual material received in such a way was applied to compare the level of their assimilation of the basic concepts of the studied material.

Second-year students of the Faculty of Mathematics, Informatics and Natural Sciences, Major strem «Pedagogical Education», profile «Technological Education» in Ershov Ishim Teachers Training Institute (branch) of Tyumen State University, Omsk Teachers Training University and the Faculty of Technology and Business of Kemerovo State University took part in the educational experiment. In the course of carrying out the experiment 287 people participated in it (144 students – the experimental group and 143 people – the control group).

The research problems were connected with the experimental check of the effective use of the didactic teachware (the high-tech educational laboratory equipment based on digital technologies with program control for the improvement of the quality of the technological training of the students majoring in «Technological Education».

The chosen groups of students were completely identical (the same year of the beginning of their study, the year of study, the age etc.). The level of knowledge and the number of students in groups were the same. In the experimental groups while teaching students to the bases of electrophysical and electrochemical methods of processing of materials we applied the technique based on the use of the created didactic set of the high-tech educational laboratory equipment based on digital technologies with program control, and in the control groups the traditional technique of teaching students was used.

Under the traditional technique used in the control groups we meant the carefully selected, specifically recorded and analysed options of traditional teaching that could be opposed to the experimental options. «Traditional training is a training when a teacher is focused first of all on instructing students and explaining them the ways of actions intended for the reproducing assimilation; a teacher is the only active and initiative person in the educational process. Traditional training has mainly a reproductive character» (Osintseva, 2000).

While carrying out any educational experiment for receiving some objective and reliable data its planning plays an essential role. The plan defines the character of separate stages of any experiment and the order of their realization. Researchers use different plans of experiments: with the use of stating and check experiments together with forming, stating and forming ones, forming and control ones and others.

We will give an example of the comparative experiment used in psychoeducational researches more often and as a rule it includes three stages:

At the first stage of the stating experiment we chose two groups (experimental and control ones). We determined the initial condition of the level of the formation of the students' technological training while studying the modern methods of processing of materials. For this purpose we organized special testing in both groups and the preexperimental knowledge and abilities acquisition which showed that the students had a low level of technological preparation in the field of high-tech production with the use of technological innovations (electrophysical and electrochemical methods of processing of materials in particular).

At this stage for the organization and carrying out the educational experiment we tried to create all the necessary conditions: we equipped the laboratory on processing of constructional materials with modern teachware; created the high-tech educational laboratory equipment on processing of constructional materials by methods of electrospark, high-frequency electrospark processing and material hardening by currents of high frequency; determined the content of the future Technology teachers' theoretical and practical training, teaching them to electrophysical and electrochemical methods of processing of materials; developed and introduced in the educational process the course «Bases of Electrophysical and Electrochemical Methods of Processing of Materials» based on the use of the high-tech educational laboratory equipment; integrated the content of technological and general technical disciplines with physics, chemistry; created the diagnostic tools for determination of the efficiency of the students' educational cognitive activityts.

The work was carried out for collecting the material for creation of the program and the content of the course «Bases of Electrophysical and Electrochemical Methods of Processing of Materials», the methodical instructions on conducting laboratory workshops. We designed a set of the hi-tech educational and laboratory installations on processing of constructional materials by methods of electrospark, high-frequency electrospark processing and metal hardening by currents of high frequency.

At this stage of the experiment we organized observation, discussions, questioning and testing, thus we managed to estimate the students' readiness for using scientific knowledge, laws of physics, chemistry in productions, their readiness for integration of the content of natural-scientific, general technical and technological disciplines while explaining the work of various equipment, etc. (Grocheva, 2015).

The analysis of the questionnaires showed that 85 % (243 students) had no sufficient knowledge for the realization of integration of the content of various disciplines. But 100 % (287 students) showed some interest in gaining the necessary knowledge. More than 92 % (264 students) (in Ishim – 100 %) were neither familiar with the devices and the principle of the work of the equipment (electrospark, high-frequency electrospark processing and metal hardening by currents of high frequency) nor saw them. But at the same time the students understood that the knowledge was necessary for their individual development and professional growth. The low level was shown while solving the creative tasks that demanded the knowledge of various disciplines – 25 % (71 students).

The second stage of the experiment – a forming one – is connected with the introduction of the didactic set connected with the course «Bases of Electrophysical and Electrochemical Methods of Processing of Materials» into the educational process. In this regard in the experimental group during the students' acquaintance with high-tech production we used the created set of educational and laboratory installations of the high-tech equipment based on digital technologies with program management (Sidorov et al., 2010, 2011). The classes were given with the application of the problem and research methods. Each step assumed the realization of the students' creative activity on the bases of the the didactic principle – the connection of theory and practice. In the control group we used the traditional technique of teaching students without the use of the high-tech educational laboratory equipment.

The main objective of this stage of the experiment was the identification of the influence of the use of the set of the high-tech educational laboratory equipment in the experimental group while teaching the students majoring in «Technological education» to the bases of electrophysical and electrochemical methods of processing of materials. During this stage of the pilot study the following problems were solved:

- experimental confirmation of the positive influence of the use of the set of the hi-tech educational laboratory equipment on the quality of formation of the students' practical skills;

- justification of the didactic expediency of the use of the educational laboratory equipment in the course of teaching students mahoring in «Technological education» to the bases of electrophysical and electrochemical methods of processing of materials;

- introduction to students the methods of educational and research work at classes with the use of the hi-tech educational laboratory equipment and the project-based learning.

The students made the educational and research experiment to find the optimum modes of processing of materials according to the type of the work environment, some electrical parameters, the time of the tool influence on the details that allowed students to understand the entity of electrophysicochemical methods of processing of materials.

In the methodological recommendations to the laboratory course about carrying out the educational and scientific work consisting in the study of the principles of the installation functioning, its construction, the modes of processing of different materials there were tasks connected with the explanation of some production processes from the point of view of Physics and Chemistry, the assessment of the structural changes and the mechanical properties in case of metal hardening by currents of high frequency (Science of materials). Besides, the students were offered the tasks connected with the improvement of the laboratory equipment and design of other equipment with the use of some laws of Physics and Chemistry. At the end of the course of study we suggested some diagnostic tests to reveal the level of the students' knowledge and abilities to realize their integration while studying different subjects, their abilities to solve creative problems, etc.

It turned out that in the check groups where instead of the laboratory course we used special literature during the practical lessons the students' knowledge, skills and abilities to solve creative tasks were lower – 17–55 % (according to different parameters).

So, the students of the experimental groups showed the abilities to integrate knowledge from different subjects 30 % higher, their designer and construction knowledge – 47 % higher. All the students of the experimental groups were ready to solve creative tasks, in the check groups the number of such students is about 65 % (186 people). The same we could see in case of the assessment of the students' level of mastering skills in independent work with different equipment and instruments, with educational literature. In the experimental groups all the students were engaged in scientific researches – they showed better abilities to analyze the results of their independent researches and to draw conclusions. Comparing the results of the students' proficiency to operate different laboratory installations in different IHL we could see that at Tyumen State University where the equipment is better than at Omsk State Teachers Training University and Kemerovo State University the results according to the cognitive and creative parameters were 12 % higher.

The third stage of the experiment – the control experiment had the following objective – the final check of the results of the forming stage of the experiment and the final confirmation of the research hypothesis that specified the technique of holding lectures and the laboratory course aimed at the students' acquaintance with the bases of electrophysicochemical methods of processing of materials with the use of the created set of the high-tech educational laboratory equipment and the methodological recommendations to the laboratory course. At the end of this third stage of the experiment the control test (cutoff) was carried out. The cutoff reflected the completeness of the students' assimilation of the main concepts of the studied material. The cutoff allowed to draw the conclusion that the applied technique of teaching the students majoring in «Technological education» to the bases of electrophysical and electrochemical methods of processing of materials using the created set of the high-tech educational laboratory equipment (ectrospark, high-frequency electrospark processing and metal hardening by currents of high frequency) in the experimental group was more effective in comparison with the traditional techniques applied in the check groups without the use of the mentioned above educational and laboratory installations.

To reveal the students' level of assimilation of the concepts of the course «Basis of electrophysical and electrochemical methods of processing of materials» we worked out special tests.

4. Discussion

A large number of works are devoted to the questions connected with theory and techniques of organization and carrying out educational monitoring, they give some recommendations about the scientific organization of the system of educational monitoring with the use of modern test technologies. They are: the organization of the experimental work at school for principals, teachers, tutors (Zagvyazinsky, 1993); the scientific psychological research with the elements of mathematical statistics (Nemov, 1999); the experimental work in educational institutions (Novikov, 1998); the system and methodical support of teaching and educational process in training specialists (Bespalko, Tatur, 1989); the scientific organization of educational monitoring in IHL (Avanesov, 1989); the scientific educational researches (Babansky et al., 1988); the mathematical statistics in educational researches (Grabar, Krasnyanskaya, 1977); the materials and methods of educational researches (Zhuravlev et al., 1979); the structure of competence in innovative development (Naumkin, 2013, 2014); the methods and methodology of psychological and educational researches (Obraztsov, 2004); the pedagogical bases of education standardization and training graduates at the teachers training universities in general technical disciplines (Osintseva, 2000); the teachers' training for innovative activities (Morozov, Pidkasisty, 1991); the system of the future teachers' training for innovative activities (Tynnikov, 2015); the correlation of assessment and self-assessment in diagnostic procedures for the assessment of the teachers' innovation (Tyunnikov, 2016); the techniques of carrying out educational experiments and the results of researches (Sidorov, 2014).

«Education test is a system of tasks characterized by the increasing difficulty and its specific form which allows to estimate the structure and to measure the level of knowledge, skills» (Avanesov, 1989).

The use of test tasks allows to check the quality of the students' assimilation of the studied material in a short period of time and to define the directions for individual work with every student. The main «instrument» of test check is the test that includes two basic elements: a task and a standard-a model of the correct and high-quality task performance to which the course and the results of the students' work are compared.

While working out the tests we applied the technique offered by V.P. Bespalko. According to him, there are tests of four levels (Bespalko, Tatur, 1989):

Level 1 – tests for identification, distinction and classification of the studied objects. They require to recognize the studied information during its reexperience (action with a hint);

Level 2 – tests for identification of the students' abilities to reproduce the information without any hint and without books: a substitution test where a word, a phrase or other text element are intentionally passed; a constructive test that assumes the students' independent reproduction of information without a hint or a book; a test-standard task in which the gained knowledge is applied in standard situations;

Level 3 – tests – non-standard tasks demanding heuristic, non-standard actions. These tasks can be of two versions: tasks demanding transformations of the acquired technological data or the ways of actions and tasks for training of spatial imagination, spatial and creative thinking.

Level 4 – tests for identification of the students' creative abilities, research opportunities according to the information, new to this branch of science.

The considered above Levels 1 and 2 connected with the assimilation of the studied material became the basis for the created test tasks. Test check gives a chance to check the formation of the students' knowledge, abilities, skills (at the level of their acquaintance with the studied material and its reproduction) without any significant classroom time consumption.

Tests are usually set in the form of list of questions demanding short and definite answers or in the form of tasks which solution doesn't take a lot of time, but requires unambiguous solutions. Using such a method it is very important to decide on the criteria for the evaluation of the students' successful test performance. The coefficients of the students' assimilation of knowledge and abilities can be a quantitative expression of these criteria (Bespalko, Tatur, 1989).

It is necessary to bear in mind that the quality of control of the students' proficiency depends on the quality of the used test.

While creating the qualitatively made measurements (tests) it is necessary to follow the following criteria of their quality determination: validity, simplicity, definiteness, unambiguity, objectivity, efficiency and reliability (Zagvyazinsky, 1993).

The criterion of test validity is a concept which represents an indicator of the test compliance to the studied material of the course «Bases of Electrophysical and Electrochemical Methods of Processing of Materials» by students majoring in «Technological education» for their training for the future work at school. Validity tests were carried out by means of the delphi technique connected with the attraction to the assessment of the studied material of the most competent people whose opinions supplementing and rechecking each other allowed to estimate objectively the studied process. The experts were highly skilled teachers of the IHL where the experiment was conducted. They were offered to answer every question in the test (only «yes - no»). In other words they were offered to answer the following question: «Do you think that every question of this test corresponds to the purpose of the given research?» At the same time the level of the objectivity of the studied information depended on the number of independent experts. The higher the number, the higher the reliability of the information. As a rule, the number of the experts involved shouldn't be less than six people, in our case number of experts were 10.

The results of the questioning are presented in Table 1.

The validity criterion β of the created test tasks were calculated by the formula (1) (Osintseva, 2000).

$$\beta = \frac{(a_1 + a_2 + a_3 + a_n)}{100 \cdot n} = \frac{12680}{100 \cdot 130} = 0.97 \tag{1}$$

where a_n - a sum of all the experts' positive estimates about the need of the inclusion of each of the offered tests, expressed in percent;

n - a number of test tasks.

This formula is applicable only in the cases when each value of a > 50%. The tests are considered to be valid if the value β ≥ 0,63. In our case the calculated value β was – 0,97 that demonstrated rather high validity of the created test tasks.

The criteria of simplicity, definiteness and unambiguity were defined from the application of the tests for creation of which Bespalko and Tatur's technique of test creation was applied (Bespalko, Tatur, 1989).

The inclusion of the tasks of the two equivalent levels of complexity (1 and 2) in the tests formed the basis of the determination of the criterion of simplicity of the test tasks. Each test task was presented by a task, a question or a statement. The students had to perceive all the test tasks, keep them in memory and try to answer the question. So we tried not to trouble them during this period of activity with additional difficulties.

The criterion of definiteness of the tests was found in the course of the experiment by organizing the observations of the students for the purpose of the identification of correctness of their understanding of the test tasks. The students reading the tests were to understand well what knowledge and skills and in what volume they had to demonstrate.

Table 1. Criteria of objectivity of the test tasks

Test number	Expert number										Sum of positive opinions, %
	1	2	3	4	5	6	7	8	9	10	
1	+	+	+	+	-	+	+	+	-	-	70
2	+	+	+	-	+	+	+	-	+	+	80
3	+	+	+	+	+	+	+	+	+	+	100
...											
129	+	+	+	+	+	+	+	+	+	-	90
130	+	+	+	+	+	+	+	+	+	+	100

The necessary existence in the test tasks of standard answers containing their correct and full contents was provided with the criterion of unambiguity of the test tasks.

The criterion of objectivity of the test tasks was reached with the help of equal conditions for the students in the course of their implementation: each student got a package of equivalent tasks containing 13 tests and covering the whole studied course «Bases of Electrophysical and Electrochemical Methods of Processing of Materials». Before testing all the students were instructed about the procedure of testing (to avoid all the possible misunderstanding when processing the test results). The students were given the time necessary to complete the test. They were not given time to think over the answer. The total time to complete all the test tasks was about 30 minutes, about two minutes per a test.

The criterion of efficiency of the test tasks was established by the careful analysis of the students' answers. For this purpose we revealed easy and difficult tasks:

- the test all the students gave 95-100 % correct answers was easy;
- the test 0-5 % students could fulfill was difficult.

Such tests as a rule have no differentiating ability to distinguish the students who know the subject better from those who know worse. In our pilot study among all the test tasks we revealed only one (Test 5), 95–100 % students fulfilled it (Avanesov, 1989).

5. Results
To ensure the criterion of reliability and validity of the assessment of the test tasks we sampled the values of the coefficient of the students' acquisition of knowledge and abilities connected with the studied material using Bespalko and Tatur's technique (Bespalko, Tatur, 1989).

The tests consisted of two parts – tasks and standard answers. The tasks were given to the students, the standard answers were the models of correct and consistent fulfillment of the tasks. With the use of standard answers it was easily to determine the figure p of the essential operations necessary for the complete fulfillment of the test. Comparing the students' answers with standard answers for determining the correct operations the tests gave the chance to define the coefficient of completeness of the students' acquisition of the basic concepts of the course K. It was calculated on the following formula (2),

$$K = a/p \qquad (2)$$

where a - a quantity of the students' correct answers; p - a quantity of the standard answers.

This coefficient was normalized to the condition $0 \leq K \leq 1$. If the average value of the coefficient of the students' acquisition of the basic concepts of the course $K \geq 0,7$ we considered the material to be studied well. In our case the value Kexp. = 0,83 (Tyumen State University); Kexp. = 0,82 (Kemerovo State University); Kexp. = 0,81 (Omsk State Teachers Training University) fit into the framework of the interval (0,7-1) that we tried to reflect in the following histogram (Fig. 1).
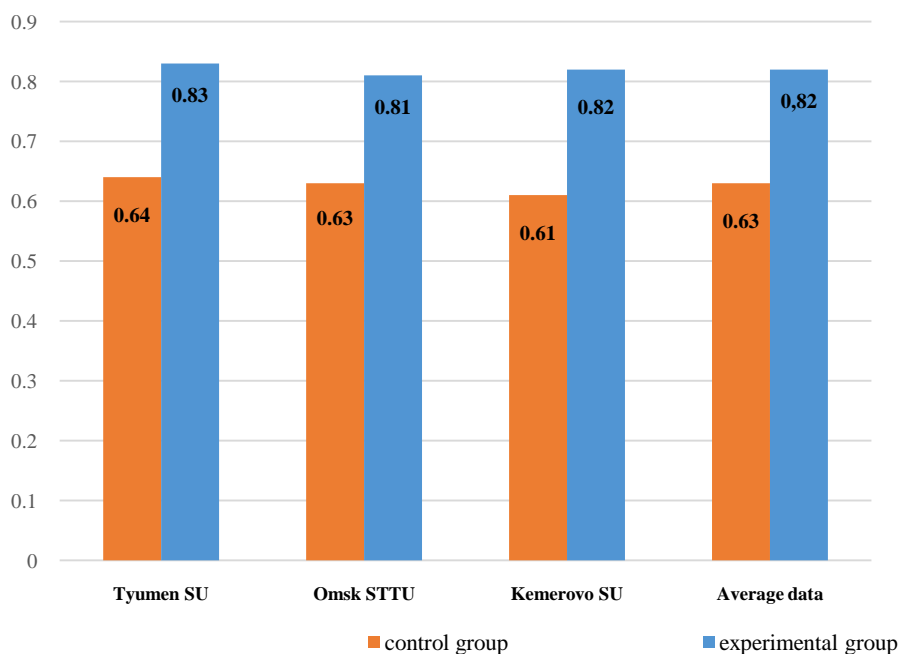

Fig. 1. Experimental and control groups

On the basis of the obtained data in the control and experimental groups we defined the coefficient of the effectiveness of the applied technique η, equal to the relation of average coefficients of the students' acquisition of the basic concepts of the course in the groups using the formula (3):

$$\eta = K_{exp.} / Kcont. \qquad (3)$$

where Kexp. - the coefficient received in the experimental group;

Kcont. - the coefficient received in the control group.

In the experimental group the applied technique was more effective in comparison with the traditional technique in the control group when $\eta > 1$.

The results of the pilot study at Tyumen State Uuniversity, Kemerovo State University and Omsk State Teachers Training University allowed to define the coefficient of the students' acquisition of the basic concepts of the course and the efficiency of the applied technique.

From the histogram we see that the applied training technique in the experimental group with the use of the created didactic set of the high-tech educational laboratory equipment based on digital technologies with program control was more effective in comparison with the traditional one we had applied in the control group (without the use of the above-mentioned educational

laboratory equipment). It promoted the high quality of the students' acquisition of the basic concepts of the course «Bases of Electrophysical and Electrochemical Methods of Processing of Materials».

For the exact analysis of the efficiency of the applied experimental technique it was necessary to check the experimental data by methods of mathematical statistics and we did it. For this purpose we used the Student's t-test oriented on the check of the reliability of the data as we show below.

For the assessment of the criterion of tests reliability the splitting technique was used. We created the final test tasks (10 variants for Levels 1 and 2). Each variant consisted of 13 test tasks.

All the test tasks were divided according to the principle of division into even and odd questions. In that case we assumed that two parts of one variant would correlate as they would be fulfilled by one student.

Below we will review an example of the determination of the criterion of tests reliability for Variant I option of the final test. 10 students fulfilled it (Table 2). The criteria of the test reliability for other variants were defined in the same way

where $P_{эij}$ - the quantity of the correct standard answers of i (student) and j (the variant number of the even and odd parts of the test task);

x_{nj} - the quantity of the correct answers of i (student) and j (the variant number of the even part of the test task);

y_{nj} - the quantity of the correct answers of i (student) and j (the variant number of the odd part of the test task);

$\sum Xij$, $\sum Yij$ - the total quantity of the correct answers of i (student) and j (the variant number of the even and odd parts of the test task).

To find the coefficient of reliability of the tests we defined the coefficient of linear correlation (interrelation coefficient) which could change in the range from (− 1) to 1.

Under the correlation we understand the interrelation between two reasons expressed in a quantitative form. It shows how one factor can change relative to the other and how they are related to each other.

In our case we calculated the coefficients of linear correlation, received by ten students in the even and odd parts of the test task for Variant 1. It was (4, 5, 6):

$$SSx_{ij}=[(x_{1j})^2+(x_{2j})^2+ \ +(x_{nj})^2]-\frac{(\sum x_{ij})^2}{k} = 646.9 \qquad (4)$$

$$SSy_{ij}=[(y_{1j})^2+(y_{2j})^2+...+(y_{nj})^2]-\frac{(\sum Y_{ij})^2}{k} = 419.9 \qquad (5)$$

$$Sp_{xy}=[(x_{1j}\cdot y_{1j})+(x_{2j}\cdot y_{2j})+...+(x_{nj}\cdot y_{nj})]-\frac{\sum X_{ij}\cdot\sum Y_{ij}}{k} = 332 \qquad (6)$$

where k - the quantity of tasks in the test. So the coefficient of correlation of the two halves of r_k of the test was (7) (Avanesov, 1989):

$$r_k=\frac{Sp_{xy}}{\sqrt{SSx_{ij}\cdot SSy_{ij}}} = 0.637 \qquad (7)$$

The received r_k value = 0.637 (Table 4).

The reliability of the assessment of the importance of the relation between even and odd parts of the test was checked with the use of Nemov's technique (Nemov, 1999).

Table 2. Final test tasks for 10 variants

№ task	№ Variant									
	I	II	III	IV	V	VI	VII	VIII	IX	X
1	1	2	3	4	5	6	7	8	9	10
2	11	15	16	12	18	19	13	21	22	23
3	14	24	29	17	25	32	20	26	35	36
4	27	28	37	30	31	38	33	34	48	49
5	40	41	42	43	44	45	39	47	52	62
6	53	54	50	56	51	58	46	60	61	75
7	63	67	55	64	57	71	59	65	74	88
8	66	76	68	69	70	77	72	73	87	101
9	79	80	81	82	83	84	78	86	91	104
10	92	93	89	95	96	90	85	99	100	114
11	105	106	94	108	109	97	98	102	103	117
12	118	115	107	121	116	110	111	112	113	127
13	128	119	120	129	122	124	123	125	126	130

We compared the calculated correlation coefficient with the degree of freedom n - 2, where n - the quantity of the data in the correlated ranks (in our case it was 10). We noticed that the importance of the correlation coefficient depended also on the set level of the accepted probability of errors in the calculations. The connection of even and odd parts of the test is significant if the calculated value of the correlation coefficient exceeds the tabulated value. Between the data of the even and odd parts of the test there was a significant connection as the critical value of the correlation coefficient for 10 - 2 = 8 degrees of freedom and the value of significance equal to 0,05 was 0,6319 that was less the calculated value according to the formula (7).

The reliability of the assessment of the importance of the connection of the correlating values of the even and odd parts of the test we checked using the formula (8).

Table 3. Determination of the criterion of reliability of the tests for Variant 1 of the final task

$P_{эij}$	i	1	2	3	4	5	6	7	8	9	10	$\dfrac{\sum Yij}{\sum Yij}$
22	xnj	19	20	17	15	18	11	7	14	8	13	142
13	ynj	10	11	8	7	12	10	7	5	9	13	92

$$\text{t} = \frac{r_k \sqrt{n-2}}{\sqrt{1-r_k^2}} = 2.33 \tag{8}$$

where n - 2 – the quantity of the degrees of freedom for the correlation coefficient.

We substituted in the formula (8) the value of our correlation coefficient for 10 - 2 = 8 degrees of freedom and got the value of the coefficient t = 2,33, we compared this value with the tabulated value 2,31 with the level of significance 0,05. So we could draw the conclusion that the compared values from the two samples of even and odd parts of the test really statistically and definitely differed with the probability of error less than 0,05 as the received value was more than the tabulated value, so the connection between these two samples of the test was significant, that was reliable (Osintseva, 2005).

For the reliability measurement of the test task we used the reliability coefficient rnt defined with the Brown-Spearman formula (9).

$$r_{nt} = \frac{\left(\sum x_{ij}\right)^2}{k} = 0.78 \qquad (9)$$

The values of the reliability and validity coefficients of the test tasks for 10 variants according to the mentioned formulas are specified in table 4.

$$t = \frac{t_1 + t_2 + \ldots + t_{10}}{10} = 2.6 \qquad (10)$$

$$r_{nt} = \frac{r_{HT1} + r_{HT2} + \ldots + r_{HT10}}{10} = 0.8 \qquad (11)$$

Summarizing the received values of the coefficients t and rnt for each variant and dividing into the total quantity of the variants using the formulas (10; 11) we could find the average criteria of the coefficients of reliability and validity of all the tests: the validity criterion of the tests according to the formula (10) is t = 2,6 with the degree of freedom 8 that was more than the tabulated value - t = 2,31. It meant that the compared values from the two samples of even and odd parts of the test were really various with the probability of error less than 0,05, therefore the connection between these two samples of all the tests was really reliable (Nemov, 1999).

Table 4. Values of the coefficients of the correlation of reliability and validity of 10 variants of the final test task

Students	Variant I		Variant II		Variant III		Variant IV		Variant V	
x_i, y_i	$x1$	$y1$	$x2$	$y2$	$x3$	$y3$	$x4$	$y4$	$x5$	$y5$
Pэij	22	13	21	13	10	19	21	26	15	12
1	19	10	11	10	10	10	17	12	7	6
2	20	11	17	7	9	8	15	25	8	7
3	17	8	15	12	7	17	10	14	6	10
4	15	7	21	8	6	11	18	11	12	12
5	18	12	20	7	9	15	21	10	4	8
6	11	10	14	12	10	14	14	22	8	4
7	7	7	10	13	8	12	11	28	10	2
8	14	5	12	10	7	19	10	17	3	1
9	8	9	8	9	5	10	16	24	14	7
10	13	13	19	11	6	16	8	20	9	9
$\sum Xij$	142		147		77		140		81	
$\sum Yij$		92		99		132		173		66
SPxy	332		296.5		189.1		484		156.7	
r_k	0.637		0.696		0.648		0.634		0.680	
t	2.33		2.74		2.40		2.31		2.48	
r_{nt}	0.778		0.821		0.787		0.776		0.809	
Students	Variant VI		Variant VII		Variant VIII		Variant IX		Variant X	
x_i, y_i	$x6$	$y6$	$x7$	$y7$	$x8$	$y8$	$x9$	$y9$	$x10$	$y10$
Pэij	6	11	16	13	7	10	18	16	10	11
1	5	7	11	10	7	10	7	8	8	3
2	4	8	15	6	3	5	11	9	9	4
3	2	4	10	13	4	8	8	11	3	2
4	5	3	7	11	6	4	13	12	4	1
5	3	9	12	8	5	9	17	6	5	8
6	4	10	9	9	2	7	10	5	7	4
7	6	8	13	12	5	6	12	4	10	5
8	4	11	16	7	2	10	15	10	6	2

9	1	7	14	5	5	9	16	7	7	3
10	3	10	10	7	4	8	7	3	8	9
$\sum Xij$	37		117		42		116		64	
$\sum Yij$		77		88		76		75		41
SPxy	64.8		215		73.4		212.7		81.6	
r_k	0.642		0.652		0.677		0.703		0.672	
t	2.37		2.43		2.6		2.79		2.56	
r_{nt}	0.782		0.789		0.808		0.826		0.804	

From the formula (11) we see that the received reliability coefficient is 0,8 that satisfied the range from 0,7 to 0,9 and showed the sufficient reliability of the tests.

The criterion of test validity was the most important criterion for the assessment of the results received at different investigation stages.

The obtained results show that the created test tasks to the course «Basis of Electrophysical and Electrochemical Methods of Processing of Materials» comply with the necessary criteria: validity, simplicity, definiteness, unambiguity, objectivity, efficiency and reliability.

6. Conclusion

Basing on the results of the experimental pilot study we can draw the following conclusions:

- the obtained data proves the efficiency of the applied technique of training students majoring in «Technological education» in comparison with the traditional one (on the example of the created course «Basis of Electrophysical and Electrochemical Methods of Processing of Materials»);

- while using the active methods of teaching students (the problem and research methods, laboratory workshops with the use of the created didactic teachware (the high-tech educational laboratory equipment based on digital technologies with program control (electrospark, high-frequency electrospark processing and processing of materials by currents of high frequency) we could solve the problems of providing the technical and technological problem content with the use of testing for determining the level of the students' acquisition of the basic concepts of the course «Basis of Electrophysical and Electrochemical Methods of Processing of Materials» that promoted the improvement of the quality of vocational scientific and technological training of the students majoring in «Technological education» in IHL.

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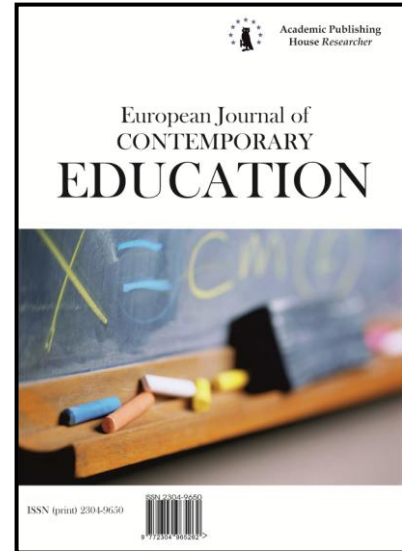
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Lies of the Reader: Disadvantages of the Sociological Research Methods for the Study of the Reading

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Abstract
The research problems of this study are the difficulties in the explanation of the phenomenon of reading in its accelerated transformations by quantitative sociological methods, because of failure to comply with a number of factors: first, the social aspects of the purchase, consumption and possession of reading materials have not yet been reading; second, reading is both asocial and social activity; third, the reader is not social status, social class, social group or social role. Author's hypothesis: the most accessible and authoritative audience methods for study of the reading – sociological research methods, are unable to disclose the specifics of the reader and reading, they provide limited data only on the outer side of the reading activity, for its quantitative indicators but do not reach to the knowledge about the nature and the reasons both for the reading and not reading. The object of this study is the use of sociological research methods in the study of the reader and the reading. The purpose is to reveal the problems generated by the classical sociological research methods, which fed up the mainstream negativity towards the contemporary reading and hinder his objective knowledge. Methodology/approach: The study was conducted by critical analytical and synthetic approach, which involves a systematic review, comparative analysis of terminology and concepts and educational integrated research on the topic „Does my microgroup read?" among Bulgarians over 14 years (2003–2017). Findings: There have been found 15 disadvantages of the sociological methods of the study of reading, as a result of which, science can get a false picture of the reading situation of local and global level. These disadvantages are as follows: 1) research vs. survey, 2) sociological propaganda, 3) the effect of the crowd, 4) fear from the reader, 5) unrecognition of snobbery towards reading and the books, 6) connotations of the word „reading", 7) literature vs. book, 8) the index „free time", 9) reading in the consumer modality, 10) reading as demonstrative consumption, 11) undefined „reader", 12) the respondent lie, 13) the respondent resistance, 14) the prejudice „compulsory for reading", 15) absence of axiological balance. As an alternative to the sociological methods for obtaining of objective results in the study

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of the reading and the readers is proposed the integrated approach between qualitative sociological methods and the methods of cognitive neuroscience and bibliopsychology.

Keywords: reading research methodology, reading statistics, education statistics, sociological methods, sociological propaganda, linguistic substitutions, truth and falsehood in surveys, response bias, crowd.

1. Introduction

Reading researchers are often frustrated by the lack of objective preliminary data on their research to correct the stereotypes in the public opinion. Direct impression of the activity of the citizens towards reading comes into collision with the suggested, widely proclaimed and quoted results of the representative surveys for a new „reading crisis" or systemic „drama with the reading". This assumption was formulated as a result of a long examination in an academic environment in Bulgaria. Students in the course „Theory of reading" in the Faculty of journalism and mass communication at Sofia University have a semester task to do their research on the topic „Does my microgroup read?" as a check on the mainstream negativity. The research is carried out through an integrative method of interviewing, observation and research by participation. Every year the results are optimistic. About 500 microgroups surveys from 2003 to the current 2017, covering in total more than 5,000 respondents from across the country and around the world, reported 100% reading in a different degree Bulgarians. We cannot doubt in the reliability of the results, since besides the inquiry, the student uses also immediate (directly and indirectly) surveillance of respondents who knows, i.e. the observing has background, tacit knowledges, prior knowledges about them and the lie, the misleading and the deception by false answer is minimized. That is why during the years my skepticism to the classical sociological tools to explore reading as an intellectual technology and general science category was increasing.

2. Theoretical basis of the critical analysis

The theoretical basis and the reference points of the critical analysis are the scientific writings and views of the classics of sociology, social psychology and philosophy Elisabeth Noelle–Neumann, Jacques Ellul, Marshall Rosenberg, William McDougall, Gabriel Tarde, Gustave Le Bon, Scipio Sighele, José Ortega y Gasset, Elias Canetti, Carl Jung, Erich Fromm, David Riesman, George Herbert Mead, Ernesto Grassi, Marshall McLuhan, Nikolas Berdyaev, Petr Ouspensky, Nicholas Rubakin, Igor Kon, Robert Escarpit, Julia Melentieva and the Bulgarian sociologists and philosophers Doncho Gradev, Ivan Stefanov, Isak Pasi, Bogdan Bogdanov, Stefan Kamenov.

3. Methodology

The thesis in the upcoming presentation is focused on the risks of generalization and fetishism of the sociological picture of reading. This thesis is based on the observation that quantitative data from the sociological surveys are the most uncritically accepted in the society that can lead to dysfunctional knowledge of reading itself. When referring to sociological surveys, revealing trends in the current readers' situation, we have seldom realize which question is more useful – what is the exact quantitative (statistical) picture of reading, how we are reading or whether we are reading at all. So relativistic is also the unilateral dissemination of surveys revealing only the instructive readers culture or seeking answer only to the question „what we read". Reading is too massive phenomenon to reduced it only to quantitative parameters. Of course, in the conditions of global uncontrollability and invisibility of the readers' practices, the most important thing is to keep this most constructive civilization developing cognitive activity not to decline.

For the proof of the author's thesis the research sets the following aims: (1) To define a common position on the effectiveness of the sociological method among experts of the highly fragmented field of the reading researches; (2) To seek weaknesses of survey research as interviewing, administering questionnaires, written surveys, polls, gallop polls, public opinion polls; (3) To answer the following questions: Do sociological research methods provide actual, reliable and valid verbal explication of the truth for reading; Is the empirical verification by sociological methods capable to reveal and explain the specifics and the practice of reading as a continuously evolving information technology; Does the knowledge of the readers' behaviour need new, different from the classical sociological tools; (4) If there are found sufficient disadvantages of

the empirical sociological methods, to be operationalized the finding of their relativistic effects on the knowledge of the real reader's situation; (5) An alternative research approach to reading to be suggested.

3.1. Research methods

The research methods of the present study are the systematic review and the comparative analysis of the terminology and the concepts. Subject of the critical analysis are the factors and the reasons for the questionableness and the unreliability of the sociological research methods in the study of the reader and the reading. The primary data for the research were derived from the years of research on „Did you read my microgroups? " (2003–2017), as well as from the published state documents, scientific researches in the cognitive science and the periodic surveys of the marketing agencies.

3.2. Concept and Terms

The concept „reading" in this study is used in its information and communication meaning. According to the current paradigm for the new literacies, reading is a process of the mediated information, not necessarily implemented with letter symbols and not necessarily carried through the eyes (eg. tactile reading of the blind people). We accept as reading a receptive process where three conditions are met: any artificially created *content* can be read, indicated with the help of any *code system* and passed through an *analytical and synthetic processing* in the brain structures responsible for reading. The concept „reader" will mean a subject that is able to absorb addressed to him written text and who performs constantly, actively and repeatedly this act.

4. Results

4.1. First problem: Research vs. Survey

Typically sociologists convinced that they have conducted an in-depth „research" of the readers and reading. It is well known, however, that it is difficult to make „thorough" „research" of the mental activity with sociological tools. The essence of the research of the scientometrical perspective is a prolonged phased activity – it goes through the phases observation, description, explanation and prediction. All sociological „researches" on the operational readership situation of the sociological and marketing agencies are not really *researches* but empirical *surveys* (in Bulgaria the most popular are the reports of ASSA-M, Alpha Research, ISSM, NCSPO, of the marketing research agencies such as „Ipsos" and „Synovate", and the reports of the structures in the executive authority responsible for the education, culture and the media). They contain summaries of empirical observations, which in its final report may eventually become the basis of the actual research.

The problem with the sociological methods for the discovering of the reading is that „research" is easily mixed with „survey". It happened in the Bulgarian sociological discourse after 1990 – it was done a gradual replacement of the practical activity „survey" with the general and broad scientific terms „study" or „research". Each surveying activity began to be called „research". The applied scientific, even more – the preparatory scientific research is nominated as a fundamental-science without explaining that the empirical activities are not „research". The reasons for this change may be two: aspiration for greater scientific weight and prestige of the activity „research" or irrelevant translation of the terms from English. In order to increase the degree of trust in the sociological methods, it must be differentiated the empirical from theoretical and in non-English speaking countries to be made a correct translation of the terms from English: study (Bulg. izuchavane); research (Bulg. izsledvane); primary research (Bulg. purvichno izsledvane); secondary research (Bulg. vtorichno izsledvane); survey (Bulg. prouchvane); empirical survey (Bulg. empirichno prouchvane); field survey (Bulg. terenno prouchvane); investigation (Bulg. razsledvane); inquiry (Bulg. obsledvane), exploration (Bulg. sondirane); poll (Bulg. dopitvane); online poll (Bulg. online dopitvane); finding (Bulg. izdirvane), overview (Bulg. pregled).

4.2. Second problem: Sociological propaganda

System messages on the results of extensive sociological surveys (empirical surveys) often acquire a sociological propaganda, which is a disguised form of information manipulation by the political propaganda. Rapid changes in the information environment cause transfer of the accent from the direct to the mediated modelling techniques. Direct propaganda, according to Jacques Ellul, must be preceded by a propaganda which is sociological by nature, slow and complete aiming

to create an atmosphere and climate of predisposition (Ellul, 1965: 15). Through various forms of information, publication and mass distribution of books, periodicals, television and video programs through education and scientific exchange, manipulators formed in the recipient a typical consumer psyche, adaptable and popularized. The necessary to them sociological climate is created unobtrusively, hidden and „unintentional", externally uncommitted politically. Disinformation paradox here is that the information interests are stimulated by data presented „objectively" that pass over the theoretical consciousness and attacked daily only by the „showcase package" of the ideas through simple conclusions and formal comparisons.

It is often said that sociologists and statisticians form the public opinion before they have investigated it. Survey researches as interviewing, administering questionnaires, written surveys, inquiries, polls, gallop polls, public opinion polls are such specific strategic method that not only shows the actual state of the public mind but is a newer form for its manipulation.

On the other hand, the very methodology of the public opinion research allows spreading of illogical summarized data that represent people as *statistical average mass*. According to the law of the large numbers, the statistical definition provides summarized notions concerning the area of unity and turns individuals into faceless multitude. Not only qualified researchers but the most educated people are *distrustful of the information that the statistics bring*. According to the German researcher Elisabeth Noelle–Neumann, animosity towards statistical area starts from the Latin phrase „*Multum, non multa*" („Much, not many things" – much „as quality", but not much more „by volume"), expressing the conviction that singular has a positive sign and plural – negative (Noelle-Neumann, 1978: 39-45).

On these grounds is formed the finding that sociological propaganda is a form for the achieving of „the effect of the crowd."

4.3. Third problem: The effect of the crowd

The negative attitude of the reading researchers to the average numbers and the sociological extracts is due to their relations to the psychology of the crowd. This detachment is intensified after the popularization of the theories of Gustave Le Bon, Scipio Sighele and Gabriel Tarde, proving the dangers of „the effect of the crowd." Lets try to attempt to summarize the changes of the individual in the crowd incompatible with the theoretical reconstruction of the reader as an individual and of reading as a top information technology and basic cognitive process.

Crowd can be a single person who we will call „crowdid". A man-crowd is generally „those who for some reasons does not value his own personality but feel" as all the others „and is not bothered by this, he is well to feel equal with others." (Ortega y Gasset, 1993: 42). As a kind of *genealogy of the crowd* for us is interesting the thesis of Marshall McLuhan. He explains the crowd as a continuation, extension of the individual. As a foursome (four laws of media) McLuhan builds a model of this phenomenon by which, according to him, he shortens the time for the otherwise too long research. According to the first law of the media, the crowd reinforces the group (here he noted that according to „Crowds and Power" of Elias Canetti, all crowds are characterized by the fear they could become smaller, with the feeling that they become smaller and by the need to become greater). According to the second law of media, the crowd remain undeveloped, shifting the individual: in a crowd each one is somebody, the crowd is a mask. Under the third and fourth law, the crowd turns „the many in one" and restores the organized power and equality (McLuhan, 1988: 150).

Anonymity. In a crowd are acquired new properties and the leading among them is the anonymity. In an anonymous situation the individual is released from the tension created by his surroundings, he hides of it behind the mask of mass and shows tendencies and behaviour unobservable and inadequate to his individual trivial ground. Sighele and Le Bon found that this is a regularity – in a crowd, the dormant properties are activated and amplified: „In crowds the foolish, ignorant and envious break off their insignificance and powerlessness, in return for which are seized by a sense of brutal, temporary but great power (Gradev, 1995: 17). The change catalyzed by the anonymity of the crowd, Le Bon understood as „atavistic sludge of the instincts of the primitive man, who the isolated and with a sense of responsibility individual is forced to rein in because of fear of punishment." (Gradev, 1995: 17).

Conformism. An important feature of a man from the crowd is the tendency to adapt. From an anthropological point of view Erich Fromm defines it as a return to primitive: „Instead of up to individualistic identity with the clan, a new tribal identification dominates today which base is

unconditional affiliation to the crowd." (Fromm, 1959: 62). Psychologically Petr Ouspensky has found two positions of conformation: *identification and consideration* (Ouspensky, 1996: 60-62). Compliance is a key feature of the „crowdid" described by the American sociologist David Riesman. In his famous book „The Lonely Crowd" he proves that more and more prevalent is the type of man *„other-directed"*. The man of this type has no sustainable vital purposes and orient his behaviour towards that to resemble the surrounding people and evokes love and approval in them. „This need for approval and referral – writes Riesman – goes beyond the grounds which make most people of any age to be interested in what others think of them. All people want and need to be liked by some people sometimes, but only for the today, guided by others types; it becomes their main source of guidance and a main area of sensitivity." (Riesman, 1950). Igor Kon called this kind of conformity „internal" and suggested that its due to the fear of isolation (Kon, 1967: 83). But we cannot be satisfied with just this reason. It is true that the weak is always respecting the stronger for the purpose of self-preservation or for a material gain and as such is really afraid of loneliness. The intellectually weak, however, *seeks a cover in the crowd for his incompetence, lack of information and ignorance*. It is not difficult to hide there under the stereotyped slogans and taboos, prevailing opinions and theories.

Average nature. Under the „law of the mental unity of the crowds" is formed an averaged a character of the individuals – transformed spiritual entity, called collective consciousness. This is a „logical mental activity inevitable determinant that premises the creation of „the organized crowd" (Gradev, 1995: 13). Even the ancient Greek sage Solon noticed the changes of the individual in the collective. According to him, when the Athenian is alone, he is sufficiently vigilant and vulpine, but if melt into the crowd, becomes one of the sheep in the herd. Popular is the Latin aphorism: *„Senatores omnes boni viri, senatus romanus mala bestia"* („All senators are good people, but the Roman senate is an evil beast"). And Frederick the Great had a confidence of every one of his generals, but gathered in a war council, he has seen only fools. Modern society, placing an emphasis on the collective properties of the individual, „give priority to the mediocrity and vegetation in an easy and irresponsible life. In this way the individuality is pressed to the wall. This process begins at school, continues at the university and is leading in all state institutions" (Jung, 1993: 147).

Average intelligence. Le Bon explains the equalization of the individuals in the crowd as a process of replacing of the primordial state of heterogeneity with the state of homogeneity (Le Bon, 1926). In this way the crowd becomes devoid of hierarchy. This is a conclusion of Nikolas Berdyaev too: „Every living system is hierarchical and has its own aristocracy, *only a pile of garbage is not hierarchical* and no any aristocratic qualities are shown up there" (Berdyaev, 1997: 96). Especially dangerous looks the levelling in the crowd resulting from the moral axiom that the inequality is bad. The totalitarian alignment in the lower strata of the society is done also from such a „moral" position. The choice of the individual, placed in a crowd, is subject to the balancing herd order. The aim of each element of the faceless crowd „to be as all" poses serious risk „all" to become „disgusting rhinos deprived of intelligence, honour and feelings" (Kon, 1967: 248). Not accidentally Leo Tolstoy warned: *The most dangerous sentence is „Everyone does so"*.

Nothing great can be born from an averaged intelligence. The great achievements of thought, the crucial discoveries and solutions to problems are attributed only to the individual working in solitude. Popular is the metaphorical division of people (respectively their intellectual abilities and searches) at three levels: *highbrow* – the top, the elite of the intelligentsia, *middlebrow* – mainstream society and a significant part of the intelligence, and *lowbrow*, i.e. the uneducated or people with neglected education (Lynes, 1976: 146-158). The latter are typical among the crowd. When we consider the growing today pretensions of the quite recent silent crowd that takes advantage of the social networks to be heard his voice, we can make sure that the category *middlebrow* (people with averaged intelligence) really exists. They go through theatres and exhibitions, buy a book of some classic, but rank it in the library and in the evening go to bed with their favourite criminal or pink reading. Today, this type of man wants to be accepted into the citadel of literature and the arts, while recognizing that he is not known with the most valuable culture. There are French intellectuals among this new socio-cultural class who have not read „Les Misérables" of Victor Hugo, there are Germans who recognized that they can not reach the end of „The Glass Bead Game" of Hermann Hesse. Each of them is pleased with his own educational level and feels completed intellectually. The half-education is boastful and dangerous and its both

extremes: in the form of „stupid prudence" (Plato), which imitates a process of thinking, but actually rotating in the cycle of rigid notions; and in the form of „made sin" (Fichte), i.e. of anarchic irresponsibility of intellectual parvenu, drunk from the authoritative power of the individual experience of knowledge, able to „invent" the truth and fall out of his habit to derive it from the essence of the things (Ortega y Gasset, 1993: 80). And this „educated ignorance" is typical of the *average intelligence*.).

Intellectual hermetism. As we see, in all the in-depth descriptions of the type „man in the crowd" – „crowdid", stands the diagnosis *„intellectual disability"*. The crowd, says Saint-Evremon, has always been an enemy of the wise men. „In the collective soul – wrote Le Bon – the intellectual abilities of the people and hence their individuality disappear. [...] This integration of simple characteristics explains the inability of the crowds for activities requiring high intelligence." (Le Bon, 1926: 27). This degradation is caught by Guy de Maupassant: „How often have I noticed that the intellectual faculties become sharper and more refined as soon as we live alone, that they are blunted and abased when we mingle once again with others." („Sur l'eau", 1878; *see* Moscovici, 1986: 11-12). You can add here also the Schiller's couplet: „Alone, everyone is reasonable and understood / if gather, here's a fool". In his study „The Group Mind" William McDougall shared the statement for the collective suppression of intelligence, as according to him the mental activity inherently is limited under the influence of the unfavourable conditions created by strong emotions and the crowd with its impressiveness scared and does not allow „heretical" behaviour, even thoughts (McDougall, 1920). The „crowdid" who lives in blissful state of the omniscience, but at the same time has a peculiar laziness of thought, does not feel the lack of anything external and finally anchors in its own stupidity. This operates the mechanism of blocking which result José Ortega y Gasset defined as „intellectual hermetism".

The analysis of the statements of the cited authors allows supporting the finding that the intelligence of the crowd falls below the level of the individuals who constitute it and that people with lower intelligence are pulling these with the higher one to their level. This leads to the belief that sociological mechanisms of *averaging* and *consideration with others* are irrelevant to the individuality of reading and the reader.

4.4. Fourth problem: Fear of reader

The generalization, collectivization of the reader's behaviours through standardized questionnaires and inquiries is unconscious resistance against the free and unguided reading, which has deep historical roots. The reason is psychological – unspoken fear of the readers.

For what is the *status of the reader in the civilization*? Being individuality, to be free means to be a reader – the most prestigious *synonymous of a man* in the whole written civilization. At various times and in various countries the term „reader" has been taking different quantitative and qualitative characteristics (for example, during the second half of the 20th century in Austria such status possessed one who has read a book per month, in France – anyone who read at least one book a year, in England – everyone who read, but non-professionally). Today, reading is a prerequisite for moving from one perceptive category to another to expand the human horizons, to rise above the crowd, for elitism. Under the latest reading is a „springboard" to move from a cultural and psychological category to another.

Moreover a type of a cultural role, the reader is a psychological category: we should treat him as an individual, not as a mass and even more like a crowd. In the researches on the dynamics of the reading situation, there should be given preponderance of the psychological model of reading. The psychological model of reading is consistent with the actual individual characteristics of the perceiver (according the receptive aesthetics) and is interested in the actual individual differences between readers. While so-called „social model for reading" (Mailloux, 1984: 40-65), where is paid attention primarily to the reader's communities, are suitable more for historical and statistic and sociological analyzes.

Another argument in support of the thesis of the *inequality of the readers*. The book, the written message are predominantly *individualizing media formats*. We mean precisely the freedom and the creative diversity that each stage of the algorithm reading is characterized – perception, understanding, comprehension, interpretation and impact on the personal conduct. The uniqueness in the acting of each stage, the uniqueness of the creative realizations and interpretations – these are the functional characteristics of reading as a personal and inimitable mental technology. The written source is necessary for the reader in order to be able to emphasize

his individuality, to put to a testing his abilities, to exercise his mental body, to rise above the everyday life and the mediocrity and strengthen his Ego.

Reading is necessary for the individual also for self-education, self-communication and self-improvement. As shown by the first component of these words-activities, the process of reading requires sole initiative, privacy and isolation (alone against the book, alone against himself). This is one of the main functions of reading – communication without mediator, an operation for individualization of the reader (for which Marshall McLuhan also spoke in his „The Gutenberg Galaxy: The Making of Typographic Man"). That he communicate with text world alone, allows the reader to strengthen his individualization, to exercise his initiative and personal reaction, which is impossible in his daily grind. Mediocrity of everyday reality and the social commitment do not give any space for self-communication nor for creation of harmony in the relations between the „ideal" and „real" Ego of the reader. In this regard are interesting the similarities between the ancient and the modern reading.

The common between them is in privacy in the communication with text, in the isolation from the organic community of the great collective and the intimacy of this act. Just as in the antiquity, the reading for the individual was representing a gateway to himself, the way to freedom from the conventions and norms, subjectivation of the meanings and interpretations of the read – all thanks to the communication in solitude and also in the contemporary reading, for the same reason, suggests activity that requires individual performance, social isolation and solitude (Bogdanov, 1989: 248). During the act of reading the individual free himself for searching, for knowledge, for discoveries and projects – capabilities far beyond the limitations of his personal experience.

Parallel to the individualized function is traditionally placed in my opinion, the incompatible with it *socializing function*. Looking at it as an act of „repetition" in the acts of reading, i.e. as an opportunity this act to be executed by many other people due to its wide availability, some scholars point out the main function of the modern reading the creation of a community of „equal reading individuals" (the so-called indicator „Open Society"). This is an ideal spiritual community that unites the users of „the culture of the indirect action". Reading, according to these theorists is a consequence of the need of value-labile individual, split personally and non-identical in the conditions of the „open society", to be „integrated tightly" in any environment that regulates his behaviour (Bogdanov, 1987: 40-44). Perhaps it is correct to recognize the presence also of the reverse to the sequestration and the individualization, integrating, i.e. the unintimating and socializing function of reading. But according to me, to talk about a world of „equal reading individuals" in our satiated with communities and information age and at a time when there is a particular lack of individuality, it is more desire, but not a fact. On the one hand, just such a spiritual community, just such a general state of minds the theorists find in the television communication. When is talking about repetition of the act of reading and its multiplicity, we should not forget that this may mean repetition also of the minds. It is noticed in the television communication the same quantitative distribution of the action, the same concurrency and mental belonging to an invisible audience. The general spiritual state „group" communication with one author, the general object of attention, the overall communicative environment where everyone is part of some anonymous whole, are the characteristics of the typical television horizontal communication where is formed an informal crowd like audience in the stadiums. In other words, the theoretical unification of the secluded reading individuals by the mechanism of the isolated in front of the screen spectators carries a risk to be relativized the achievements of the individual psychology of reading and bibliopsychology.

For the reading, as a process of individual growth is not needed a quantitative growth or integration. The searching for the Another in the act of reading is not driven by the need to be identify with him (except for those seeking identification with the character of the literary text) but a peculiar need of *conversation between the different minds*. The searching for the Another through reading is not a fear of the loneliness but a subjective intellectual need for controversy. There cannot be „equal reading individuals" as in the comprehensive infinite Library, according to the metaphor of Jorge Luis Borges, there are no two equal books – each of them is unique and different from the others. There cannot be „equal reading individuals" as reading is unique and unrepeatable act – a contact of exactly this reader with exactly this book. In the context of the metaphor of the Ideal World Library, reading is not only absolutely unique process, but also

multivariate opportunity to realize individualization, the diversity, the uniqueness and the originality of each reading subject. Therefore, the psychological level of individualization is the basic and most important function of reading and the so-called socializing function is permissible only in statistical and historical and socio-cultural plan.

4.5. Fifth problem: Unrecognition of snobbery towards reading and the books

The snobbery in the reading is the deviant behaviour, different from the implicit reader's interest. Regarding the book the snobbery exists, since the books exists. Still in 2nd century BC, Lucian reacts to this problem in foreshortening, which is very actual and today. The main problem, treated in his essay "The uneducated book buyer", is the fact, that people were buying not books, that they would like to read and that they would like, but books that are modern. In this antique work we have a description of 5 characteristics of the "mneme" of the reader-snob, reached on an abstract-logical way of the philosophers. As first sign of snobbery Lucianus recognizes *the manipulation of the buyer-reader*: "My dear, you do just the opposite of what you want. You count on to pass for educated; you don't miss to buy the best books, but everything goes upside down and becomes a testament for your illiteracy. Moreover, you actually don't buy the best books, but you mislead by the opinion of those people, who praise what they get, you become a gift of God for all the pseudo-worshipers of the books, a real treasure for the book sellers" (Lucianus, 1986: 84). Second sign of snobbery is *the reading with misunderstanding*: "although you are always with book in your hand, always deep in reading, you understand from the read as much as donkey from the lyre, as it moves its ears in tact with the music." (Lucianus, 1986: 86). Third sign of snobbery, according to Lucian, *is inability for critical reading and rationalization*: "You look at the books with wide open eyes, a little more, Zeus is my witness, your eyes will jump out of your head, and you read something aloud so fast, that your look leaves behind your tongue. But this in not enough. You must comprehend as the dignity, as also the disadvantage of the written and to enter as into the meaning of the whole, as into the charm of the individual expressions, to recognize which one of them are composed by writer by the established rules and which one of them are suspicious, another's or counterfeit." (Lucianus, 1986: 85). At fourth place Lucian reveals the snobbery as *distorted reading*: "Don't you see, that you fall into the same situation, when you hold in your hand a wonderful scroll, in a leather purple box and gold tip of the wand, but you read it as a true barbarian, crippling and distorting the written, among the mockeries of the educated people and the praises of the surrounding you flatters, who suddenly turn away to each other to laugh?" (Lucianus, 1986: 87). Lucian distinguishes *the anti-reading* as fifth sign of the snobbery, which predetermines the nonfunctionality of the owned book. The explanation is made by observation on the main incentive for the buying of books – not the desire to read, but the ostentation, the use of the book as an instrument for the personal ambition of the owner to be seen with a book in his hand: "Cause you will buy them to do not use them for anything and you will be ridiculed by the educated people, who seek to benefit not by the beauty or by the high prices of the books, but by the speech and the thought of their authors." (Lucianus, 1986: 95). Today, thousands of years later, the snobbery towards the books is repeatedly more actual. But for its research, for its in-debt explanation and for its correct prognosis it is not enough the Lucian's speculative method, but it is necessary the Rubakin's empirical bibliopsychological method (Rubakin, 1922; Rubakin, 1929).

4.6. Sixth problem: Connotation of the word „reading"

A problematic situation in the attempts by sociological surveys to reach the scientific truth in the knowledge of the modern reader creates a *lack of a uniform definition of the term concept „reading"* and for the deviant connotation of this word.

First, today people do not have the same understanding of the activity „reading". Even researchers who ought to know that science connotations are inadmissible put different meaning to the word „reading". The results of many years of research on the topic „Did you read my microgroups" mentioned in the introduction of this text demonstrates in a high degree this problem (Tsvetkova, 2016). The key question in the survey was „Give definition of the verb read" (Fig. 1). The majority of answers are clichés or descriptions emanating only from the personal experience: reading is a „Perception", „Follow the letters", „You take a book, open it and start to absorb the content", „Reading is reading".

What is reading?

- visual perceiving of text 50%
- cognitive process 10%
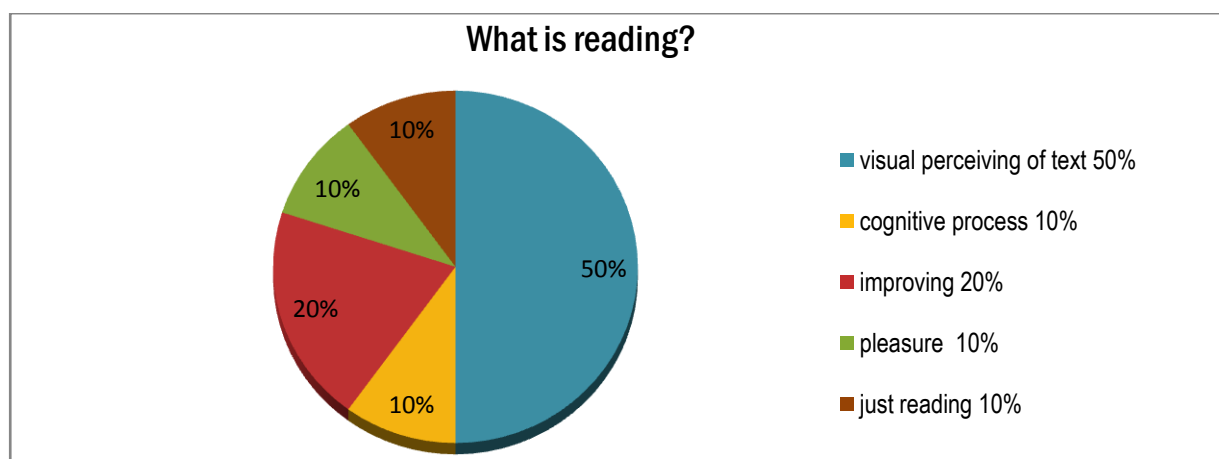- improving 20%
- pleasure 10%
- just reading 10%

Fig. 1. Give definition to the verb „read" (more than one answer)

Half of the members of the microgroups – 50 % define reading as a visual perception of a written text. Only 10 % understand reading as a complex psychological process, and another 10 % refused to give a precise definition. Not necessarily positive is the fact that respondents associate reading with a book exclusively and mostly with fiction or textbooks.

Table 1. Which of the listed objects is reading?

Objects of Reading	yes	no	dont know
Novelette	100%	—	—
Jokes	60%	40%	—
Labels	40%	40%	20%
Buildboards	10%	70%	20%
Inscriptions in the lavatory	70%	30%	—
Photo album	1%	90%	9%
Cooking recepies	60%	30%	10%

The summarized in Table 1 results show the second argument for the chaos in the people's perceptions about the subject of reading. All respondents agreed that „read" is the reading of fiction, 70 % accepted as a subject of reading the inscriptions in the toilet, and only 1% admitted the photo album as reading material too.

Second, reading during the 21st century is more than a skill. It is self-confidence and self-esteem – based on one of the three key literacies (reading, mathematics, nature knowledge). Reader, according to the norms of the European Union is a synonym of a *„multifaceted literacy"*: able to use the skills of reading and writing to create, to understand, to make sense, to interpret and critically evaluate information in a written form. This is the basis for participation in the digital environment and for an informed choice in areas such as finance, health, etc. In the era of the Internet to be a *literate reader* means: a) to find and extract information in written, printed and electronic form, b) to summarize and interpret it, c) to make sense of and evaluate it, and d) to develop your knowledge and potential and to participate in the society, including in the digital environment.

„Analog" reader has been studied thoroughly enough before the industrial era. All his habits, preferences and manners are explored. But he is different from the „digital" reader. The actual for the 21st century intensive reader is a nomad, relieving by the distances and the volumes. It is unacceptable to argue that the digital generation is illiterate or ignorant, poor or not reading. His written forms of communication cannot exist independently. This is a multimodal generation and it communicates through an orchestra of cognitive channels. These young people „see" the

printed morpheme in an electronic form. They inhabit an accelerative developing virtual reality, holistic media environment in which „experience" events rather than seeing them separately, to listen and read about them. If a modern child does not love paper books, but is well-informed and speaks and writes literate and beautiful, it would be very wrong to force it to absorb information through unnatural means. Today, in the context of the Internet and the virtual options „actively is formed a new composite figure: „reader – spectator – listener" of books (texts), whose activities should not be evaluated according to the standards of the past – wrote the Russian professor on theory of reading, Julia Melentieva. – It is also necessary to abandon the imposed in the conditions of the ideologically monolithic society strict valuation characteristics of reading, in order to unify the reader." (Melentieva, 2010: 26-33).

Third, in the digital age the very notion of reading is radically changed. „Gutenberg dinosaurs" and the „digital natives" enter into a strong dissonance concerning the stereotype that reading is that activity where only books are read. What does the first survey of the publishing company Scholastic „Kids & Family Reading Report" of 2010 (Scholastic, 2010) between children and their parents said on this occasion? The research showed something very significant – parents and children have very different views on *what the reading is like*. 51 % adults and 54 % children considered as „reading" the searching of information on the Web. Staying in the social networks is also considered as reading by 28 % of the children and 15 % of the parents. 25 % of the children believe that the exchange of SMS and SMS–viewing is reading. Here, the parents show greatest conservatism – only 8 % of them agree that SMS is a subject of reading. The new context (internet, digitization, mobile applications, communicating via social networks like Facebook, via MSN and text messages) changes the nature, the frequency and the importance of reading. This new context is not an obstacle but a source of serious motivation for reading and writing for the use of the dictionary and exercising the multilingualism.

Taking into account the benefits of these informal practices in terms of motivation, the European Commission insists on mobile applications and social networks to gain greater recognition in education and in the education policy as a whole (European Commission, 2012). The damage of the archaic connotation of the word „reading" was problematized also by the German Reading Foundation „Stiftung Lesen". During the symposium „Digitale Medien: Chancen für das Lesen" in 2014, experts from the Foundation offered to extend the concept of „reading" which to adjust the old-fashioned narrow idea for only „reading of fiction for pleasure in the spare time". Dr. Sigrid Farer explained that practically the one who surfs in the Internet, who follows the iconic navigations in the websites, also reads. He reads rules and instructions and the participant in a video game – if not proficient in reading drops out from the game. Against the backdrop of the alarming number of 7.5 million illiterates in Germany, the concept of „reading" must cover the digital media, Internet publications, Facebook and all the different computing devices and applications. The arguments of Dr. Sigrid Fahrer are that the wider definition may increase the interest in the traditional books in children and teenagers and that if a fan of video games realizes himself as reader, this will give him confidence and will increase his satisfaction from the act of reading (Fahrer, 2014).

Fourth, it is not true that there is no „new" reading. The new scientific paradigm in the cognitive science accepts that the brain is very flexible, highly adaptable to the surrounding information environment. The theory of the plastic brain of Norman Doidge (Doidge, 2015) proves that human receptive apparatus today intensively is self-educating and breaks, so that books and texts are perceived in a completely new way. It is imminent to be proven whether the brains of those who interact with technology and are restructuring of this interaction. Perhaps the structure and the organization of the brains of *„born digital"* will be fundamentally different from the organization and the structure of the brains of today's informational active man.

4.7. Seventh problem: Literature vs. Book

Dysfunction in the trying to obtain an objective picture of the readers' situation brings the deviant connotation of the concepts in the logical chain „reading – literature – a book".

Sociological surveys usually do not define in advance their working terms, i.e. when they investigate the reading, they do not make difference between non-literature and literature reading and speculate with the term „book" by reducing it to a subject of literary inclinations without considering the existence of a non-literature content in the books. I specify the problem. Scientific categories „book" and „literature" are in a relation „common – private" as we are talking about

subordination. Book is the common, literature is the private. The book in the general theoretical perspective is a trinity of code, carrier and content. But literature is only one of the types of content. The process of replacing of the common with the private and the subsequent generalization of private, even considering the common is known to linguistics as a *linguistic substitution.* In colloquial speech similar replacements may be natural, but here we talk for national, even for ideological and socio-political verbal problem. Everyday language should not engross the professional and the scientific vocabulary. Equating the book to literature, reducing the book only to a literature is an abnormal thinking, generic-species thinking in a wrong inversion.

The generalized use of the term „literature" (an assumption that „everything with letters is literature") is inadequate of the following nonlinear works and directory publishing products: musical score, logarithmic scale, a software directory, yellow pages, interviews, archival documents, dictionary, album, atlas, book-game, picture book, bibliography and bio- bibliography, catalogue, book of crosswords, collection of tests or tasks, collection with reports, a statistical report, ethics code, patent, standard, rules for traffic state, etc.

There are polls that speculate with the word „book" by subordinating it to their personal readers' preferences to the books with literature. If sociological survey refers to the interest in books, the literature-centric researcher fails to define in advance what is meant by the word „books" and often proves to have committed *unlawful terminology substitution.* For example, in the Jubilee civil ranking „15 books, I cannot do without" of the Bulgarian book-trading line „Helicon" in Sofia by the end of 2007, it was not specified that the object is only "literature" and only „fiction". Thus the book-trading line demonstrates its fetishistic attitude towards literature and automatically discriminates the non-fiction books and the non-literary reading. Someone could „not to manage" without business handbook, another – without the Bible, the third – without the Criminal code, the collection of aphorisms or cookbook and feels no need for artistic readings.

Why, when the theme in the public agenda is reading, it is suggesting, understood and articulated the reading only of literature and even only novels (as in the campaign of the Bulgarian National Television "The Big Read" in 2008)? Artificial occasion for complexes, of feeling of guilt in the user: What if I have no a favourite novel am I marginal? And a sense of limitation: it is about the genre. What if my favourite work is novel or epic or a play or a story? And if I am not generally „interested" in fiction? Which means that the voting for a favourite novel priory *discriminate the rational, scholastic type of reader.*

In socio-political discourse of post-socialist societies (even the commented here linguistic substitution can be seen also in the English-speaking countries and Germany) it is often operating with the official statistics for the not-reading or for the illiterate reader, without specifying to which reader and what reading is talked about but under the literature-centered presumption is referred only the reading of literature. It is important to know, however, that there are uneducated in literary readers – technical specialist, life science researchers, botanists, doctors, drivers, hairdressers, dressmakers, shop assistants, bookkeepers, etc. They read *books.* There are educated literary readers who read *literature.* This distinction is important because only in this way the debate on the education of people to read literature, not books, will receive its fair private space. When someone turns the reader into an object of national programs or campaigns he should specify whether he is interested in a reader of literature or a reader at all.

The problem with the generalized use of the term „literature" is on the highest legal level – in the legislation on copyright and on libraries, in the national statistics and in the higher education. (For example, the fact is that the financial education in students is deficient, see: García-Santillán et al., 2017).

It can not be objected to the use of the word „Literature" for marking or labelling of the bibliographic database of information sources. Mechanical imitation of the local tradition does not justify the methodological confusion between the concept of the information science „bibliography" with the branch of the arts – „literature". In publicism it might not be considered an error, but in science could not be allowed such inertia. The list of bibliographic descriptions of scientific sources at the end of this publication has an approved world title and it is „Bibliography" or „Sources" (References).

The risk of generalization of everything written with the name „literature" may create another meaningful dissonance. If „everything is literature", the *literary criticism* should be encyclopaedic and metainstitutional field. The profession „literary critic" should be taught in schools for

omniscience. And here come the cognitive conflicts. Does literary criticism covers all fields of human knowledge, if we call any publication „literature“? Does literary criticism covers the range of books, studies and articles on the law (legal „literature“), medical (medical „literature“) and theology (religious „literature“)? Literary critic on this formal logic should be competent also on software engineering (critic of computer „literature“), in linear algebra and analytical geometry (critic of mathematical „literature“) and fencing (critic of sports „literature“).

It would be wonderful every book to contain „literature“. But objectivity in the delimitation of the term „book“ of the term „literature“ requires to bear in mind that:

1) Literature is only one of the ten major classes of the Universal Decimal Classification (UDC), only 1/10 of the areas of world knowledge (with code 82) and according to this system are now organized the library collections worldwide. It is interesting as how are organized the rooms in the boutique hotel „Library Hotel NY” – the Library Hotel in New York, near Grand Central Station, Manhattan. It offers its guests over 6,000 volumes of books organized within the hotel in the Decimal Classification of Melville Dewey (Dewey Decimal Classification). Each of the 60 rooms is equipped with a unique collection of books for distinctive for the theme in which category is the room. Each of the ten floors bears a numerical code from 0 to 9, according to DDC. But Literature (code 800) is just VIII floor (Dewey Decimal Concept, 2011).

2) The statistics of the books in the world is also maintained by UDC and in this way is regulated since 1964 by UNESCO (UNESCO, 1964). From a total of 23 groups, the books containing literature (literature books) are only in Group 21 (Literature (8): (a) History of literature and literary criticism, (b) Literary texts).

3) The literature is not present in the subject catalogs of libraries (including textbooks) – for the subject indexing is used only non-literary content.

4) Literature is only 1/9 of the areas of higher education – according to the Classification of areas of higher education and professional fields of Bulgaria (Classifier, 2003).

5) Literature is subject to only one of the four main areas of science – humanitarian (Law for the Higher Education, 1995), while the remaining three – social, natural and technical are non-literary.

6) Literature is only one of the three objects of copyright under the laws of copyright and the related rights. This is fixed in the scope of the Art. 1 of the Bulgarian Law: „This law regulates the relations connected with the creation and distribution of works of literature, art and science“ (Law on Copyright and Neighbouring Rights, 1993).

7) „Literature“ in the classical definition is a trinity of epos, poetry and prose. But exactly the literary men tend to expand the definition of „literature“ to „any written work“. It is enough to read in the Glossary that literature are the written works that are with lasting artistic qualities (Stevenson, Lindberg, 2010), that literature is just *one of the types of arts* along with painting, music and dance, the art of verbal imagination, artwork, poetry or prose*, fine letters*. It is defined so by Joseph Brodsky: „If what distinguishes us from the other members of the animal kingdom is speech, then literature, and particularly poetry, being the *highest form of the letters*, is itself, roughly speaking, the purpose of our type“ (speech during the accepting of the Nobel prize; *see* Brodsky, 1993. According to Terry Eagleton literature is always ideology, functioning as *„imaginative writing“* whichis not literally true, fiction (Eagleton, 2001: 27, 33). Some texts are imposed to be read as literature, some texts are born as literary, some texts become literary, some literary texts imitate literary, some texts avoid literariness, some texts can never be literary. Therefore, literature is a type of *cultivated and subjectively fictional content* which is not always published in a book. A book can not be only literature.

For the proper methodological and logical thinking on the subject of reading is necessarily not to replace the word „book“ with the word „literature“. In the theory of terms, explicitly are distinguished two types of language: (1) language for general purposes (LGP) – daily or conversational language, and (2) language for special purposes (LSP) – a specialized or professional language (includes business language, academic language, scientific language). So we should therefore assume that the correct and appropriate scientific, academic, specialized terminology synonymous of the term „book“ (when we do not talk about par excellence „literature”) are the terms „publications“, „editions“, „titles“, „writings“, „materials“, „resources“, „works“, etc.

We will summarize the said till now. Literature is not equal to book. Literature and book are not synonymous. Literature is a *type of content*, and the book is the *medium that can carry it (dialectical unity of content and form)*.

The book is first *a mean of communication* and only then is a *printing product* and *library volume* and just sometimes contain *literary work*. And if the study of reading continues to fetish the literature centrism, the unscientific analysis and the wrong decisions will reproduce.

Methodologically important is reading to be associated not only with literature, not even with the written word. Otherwise, we take away the right of existence also to the books without letters or that partially with letters. The book is not only „litera" (letter of the alphabet in Latin). It is necessary to redefine the basic for the readers' practices object – the book. Because the book is not even just a paper. How many of the thrown into the fire books were burned? Neither one. Burns the paper, not the book.

4.8. Eighth problem: The indicator „free time"

Logically we come to the next reason for the risk of irrelevance of the sociological methods for the research of the reading. The majority of the sociological surveys on the media consumption are focused on the *reading in the spare time*, and not on the reading at all. With this substitution of the concepts and the inability for relevance and comparability of the results we should not agree.

Why is important the abstracting from the term „free time"? There are enough reasons to insist on avoiding the criterion of „free time" in the study of reading.

First, this is lowering the self-esteem of the continuous readers and distorts the understanding of the process of reading itself, because reading is immeasurable category.

Second, free time can be valuable only for the worker on a measured daywork, for life on standardized working hours. A worker raises the „free time" in a cult, because for him, as a screw of the big machine, the work is not a pleasure – working time is a counterpoint to free time. Today, in the information era special formation of the free time is unnecessary because it is not a value for the active man. Because the whole life, all phases of growth and education, all professions have merged with the natural information field. Work, learning, entertainment, recreation (the rest), etc. They are increasingly computerized and more intellectual. Value is the information – such as food and air. Because we live in constant information cloud there is no sense for someone to „get free" from information. There is no sense someone trying to relieve time. Therefore, in post-industrial, information age and recreation and hobbies, and entertainment are non-free time.

Third, today's children have no free time. Modern children are in new information and communications environment, move with other information dynamics. Multimedia generation moves to another data rate and everything that seems very innovative and revolutionary for the adult, for them is history and archives. The entire waking time of the digital children is occupied by activities. For them there is no such thing as free time – even when they entertain or relax, they do it actively. This term is used automatically by sociologists, pedagogues, psychologists, not considering the asynchrony of the communication and the multimodality of the sources of information to young people.

It is against the pedagogical reading to be emerged as an activity needed to „fill the free time" of the student. Researchers divided conditionally by time and by space the activities carried by a child to educational and non-educational time, and as a *„school time"*, they understand „mandatory educational activities at school" and „mandatory self-training in school" and under „non-educational time" – everything else as the time to „meet the physiological needs – sleep, food, clothes, etc.", „travelling to school and other points of training and educational work", participation in household duties, there is an interval that is used for doing activities „devoid of any coercion and obligation." (Grudeva, 2005: 107). This is the so-called „free time", which is not involved in a routine and pre-planned activity and in this logic should not exclude reading for knowledge. Concentrating on the textbook as an object of study and the book as an object of entertainment, cannot lead to negative connotations and false judgments. And here, very probably lies one of the reasons for the problematic reading in children. In general, the rethinking of the concept „free time" as an interval for satisfaction of needs and interests between the two phases of teaching time and combining them into one indivisible whole, is in the base of the qualitative improvement of the education of the personality according to the specifics of the information environment of the multimedia generation.

The findings of the review arguments is that reading should be emancipated from all temporality, including from the schedules of the so-called free time. It must be freed from its „official" mandatory and to work towards harmonization with the natural needs and interests of the new modern children. The entire time of the child must be synchronized with reading activities.

4.9. Ninth problem: Reading in consumer modalities

The problem in all surveys using the method of the inquiry, or of the interview is much more serious and lies in the consumer modality given to the reading. The so-called „research" on the reading situation do not investigate, and have no the tools to investigate the actual „reading" but only the *buying, holding* and any *external form of intimacy* with the objects for reading.

Explicit indication of this problem are the typical mass survey questions: „how", „when" and „what" is read. We can recall a parental advice of Umberto Eco: never ask a child when reads in order not to get a sharp-tongued reply „Never!". Each active citizen in today's economizing format of life is irritated by the questions if he reads, when, what, where, how … Approximately the same resentment would cause a chain of questions did you eat, when, what, where, how. Or – did you win, when, what, where, how. I believe that at least the Bulgarian read – what he wants, when he wants, where he wants, as he wants, how much he wants. Reading is extremely intimate, autonomous and individual process. And also not everyone has the same idea in mind about the process „reading".

What information about a man will give us the question „how much he read?", provided that the reading speed and the need for written sources for each individual are different. For example, a person reads one week one page, another – a magazine, third – three books, the fourth can stand a whole year reading one book and rereading it (and the maximum „Beware of the man of one book" is not accidental). We must understand that not „much reading" is important. Again, we can refer to Oscar Wilde, who said: „Today people read too much, which prevents them to be wise". More important is reading which „I need", the reading that is „only mine". If I am a follower of practices of superiority, my reading will be only specialized, sanitation and disciplined only to my profession and career (curious here is the renaming of the world famous Moscow „School of rational reading" into „School for Presidents").

Reading *is not „consumption".* Reading is „internal" activity, invisible and therefore unobservable and immeasurable, i.e. the empirical verification by objective scientific methods is not able to reveal and explain the specifics and the practice of reading.

Reading *is not mass behaviour.* It is impossible to be studied also as mass communicative activity. Important arguments in this direction gives the Bulgarian literary professor Nikola Georgiev: „I am against mass reading and even spoke against this campaign „The Big Read". It is important to identify what kind of people how read and how reading affects them. It can never, can never be a mass phenomenon, even the reading of „Under the Yoke" and of „Tobacco", not to mention the contemporary modernist novels. Not quantity, but quality is important. They say that, ostensibly, the mouse would kill the book. The number of the published books is not reduced worldwide. Well, what kills?! If we look back, we will see that the techniques in writing and reading are changing not for the first time. But in their ignorance people panic – end! Even the great philosopher Plato spoke against the written word with very serious arguments. Fluctuations between written and oral culture continues to our days. While battling Alexander of Macedonia wrote to his honourable teacher Aristotle: „Teacher, what you have done? You wrote a book concerning a question that should be spoken for. Not everything has to be written! And this is said not by a fool." (Georgiev, 2009).

Reading *is a psycho-economic indicator* (the result is mental capital in a person's head), a process of long-term investment whose results are seen minimum after 3–4 years, they are designed in the specific social or economic activity of the reader.

Here with these theoretical circumstances of reading we have to conform to, if we actually want to receive systematic general – global or national picture of the reading situation.

4.10. Tenth problem: Reading as conspicuous consumption

The reader's activity, the possession and the purchase of books is one of the components of the social deviation „conspicuous consumption". One of the marketing (rather sociological) *techniques for managing of the interests* of the book market – the charts obtained by voting by ballots, by phone or online, discourages the confidence in the achieving of the objective truth because of the following circumstances:

a) Voting. Does the specifying of „favourite titles" mean that they are read or are saved only as titles – image-making, scrapbook and quoted? The rating is de facto not obtained for the reading of the specified book, but for the thrill of the vote, as a food for the gambling instinct.

b) The voted. No doubt which rating is excited for the book traders – of the reader at all or only of the buyer. Of course the second. He in turn should be aware that the buyer is not necessarily a reader and the reader is not necessarily a buyer. And young readers yet hardly become buyers of books. Moreover – are the voting sincere or they are conformists; are they good (passionate) readers or bad (inert);whether they are actual „adopters" of the specified books or just club „claques"? And what if they remember the headlines only by a list or as parental nagging?

Disadvantages of the sociological methods can be found in any marketing attempts readings to be involved in *gambling, marathon or race*. There can not miss a winner. And he is always one. But isn't it unnatural to favour *only one book*? The unit has the power to blur the many. The bestseller ruins the diversity. The laws of the bestseller are veiled form of the technology of unconditionally worship to authority. The „hit", „the winner" always contains within itself also the charge of the aggressive invasion in the field of „up to human" effects of enchantment or the so-called fascination, of the infection by meme or viral information units. The revenge against such excesses could come if the results of the vote in the British TV format „The Big Read", for example, is formed not like a position by rating of a mechanical vote, but as a group of books in alphabetical order (ten or fifteen). Isn't it right that a man should read 15 books in his life, but to find out exactly which, he should read 15 000 (phrase of Isaac Babel).

The model „hit parade of books" or of the top lists as a tool to determine the popularity of the book as a commodity and as an effective tool for management of the behaviour of the buyer has been discredited from a long time. Positions in the rating of any city bookstore are many, and there are no coincidences practically while the target audience and the customers of the bookstores in a city hardly differ cardinally. Each, received through a direct consultation list of the broadcasted under a „main memory" titles is inoperative in the commodity-monetary paradigm „menu" – it rather involves targeting random or deliberately selected titles which do not enter into the „food" mode of the creditworthy self-made reader.

The chance of the form „rating of books" is to be sterilized in the bosom of the political folklore. So we can interpret the idea of the leader of the political bloc „Our Ukraine – PSD Bloc" Yuriy Lutsenko (Korrespondent, 2007), all candidates for deputies to the day of parliamentary elections (30 September 2007) to declare not only their incomes and their assets but also the read during the current year books.

4.11. Eleventh problem: Undefined „reader"

Dysfunction in the trying to obtain an objective picture of the reader situation imports also a lack of updated definition of the concept *„reader"*.

Therefore it remains the unaccounted for the sociologists resistance of the reader object of the survey, which either refused to answer or is thinking before responding: *Why to strip*? Reading is and will always remain a *personal secret*. Polls like „Which books you cannot without?" or more generally „What are you reading?" are a diversional sneaking into the personal space, in the kitchen of the competitors. A consultation can give a picture of reader behaviour to the publisher, but it will not be objective, but neat, hypocritical, opportunistic or untrue.

The picture of the reading obtained by the sociological method of the survey or poll can not be objective because in the *era of mercantilism and mercantilism, the questions concerning the readers' behaviour are politically incorrect*. To reveal your sources of ideas and inspiration in the intangible economy is like to share your oil reserves at the dawn of the industrial era. And I'm interested, for example, which are the desktop books of Stephen Hawking, the Dalai Lama or king Simeon Saxe-Coburg-Gotha. Aren't artists wonder what actually had read Michelangelo, physicists – what actually had read Nikola Tesla, marketers – what actually reads Philip Kotler, IT professionals – what actually reads Bill Gates (Incidentally, this answer is only seemingly anecdotal: *Bill Gates reads books for Linux*). Economizing, meritocratic reader, „the reader in rise" in no case will reveal their firm secrets – which books owe his success or which books builds hi winning strategies for the future on. I myself would jealously conceal the actual books, without which I can't. But the thing that distinguishes me from some people is that I cannot live without books.

4.12. Twelfth problem: Respondent lie

The phenomenon „respondent lie" in the sociological inquiry pictures of readers' situation cannot be underestimated. In 2009, on the occasion of the World Book Day in the UK was conducted a poll on „the secrets of readers". Two-thirds of British admit that they had to lie about the books they have read. The books which they most often lied to be read, proved to be „1984" by George Orwell's, „War and Peace" by Leo Tolstoy, „Ulysses" by James Joyce and the Bible (BBC, 2009). Sociologists call this factor of bias „answers for prestige". The problem of the objectivity of the research on reading and in particular on the statistics on the consumption of books and other reading materials is permitted by combining of two sources of information: industry reports (of the education system, libraries, bookstores, etc.) and sociological surveys. The first are based on quantitative data of the institutions and the market, but do not admit the home libraries, reading on the Internet, etc. The second compensate the first, but are known for its serious error due to the aspiration of the respondents to look better than is actually and practically says that reads more and „smarter" texts. The scientific explanation of this phenomenon can be found in the socio-psychological regularities as conformism, identification or conformation. Indisputable intervention has the so-called Hawthorne effect, reflecting the change in people's behaviour if they know that they are studied. It is a form of reaction in which the subjects improve aspects of their behaviour while they are scientifically monitored and just in response to the fact that they are studied, but not in response to any empirical influence. However, it is important to note that the reasons why readers pretend and delude for the read books, have not yet been specifically and thoroughly investigated.

4.13. Thirteenth problem: Respondent resistance

The problem of respondent lie is linked to another disadvantage of sociological methods – respondent resistance. Its appearance is recorded in the already cited research on the topic „Did you read my microgroups". It turns out that it was the key issue in the survey „Give definition of the verb „read" that irritating most the respondents. The situation is equivalent to boycott which is seen in the answer: „I do not remember", „Do I need to know definitions?", „Get out!", „Why do I need to read something?" (Tsvetkova, 2016).

Yes, there is such an individual respondent resistance against the curiosity of the sociologists. In support of this resistance the theme „The importance of not reading" got publicity, covering people talking about books or advertise themselves as connoisseurs of books, including academic researchers and teachers (The Economist, 2007). It turns out that not reading among them is a typical case. It was explored by Professor Pierre Bayard of the Paris University. Not reading among producers and proponents of reading is obviously not due to physiological illiteracy and for personal hygiene reasons. „There is more than one way not to read – says not without irony Bayard – the most radical among them is never to open a book". The fact that per year worldwide are issued between 1 and 2 million new books, talks how important is not to read everything. From the standpoint of cost-reader and rather ironically relevant to market flow reader, there are only four categories of books: 1) books, I don't know, 2) books, I have passed, 3) books, I have heard about and 4) books, I have forgotten. There are not allowed exclusions even for the books, you have published or written yourself (Bayard, 2007). However, Pierre Bayard admit that he has never read „Ulysses" of James Joyce, but he freely talk about it in front of his students (Eco, Carrière, 2011: 271).

4.14. Fourteenth problem: The prejudice „obligatory for reading"

Particularly relevant for the countercultural or anarchic dominant in today's reading is the resistance against the prejudice „mandatory", but which is supported by sociological methods. Reading at will always urge release of constraints and limitations. But the reader resists not of searched anarchism but of the sense of unfreedom, for alignments, for cultivation of the another normal citizen, decent and approximately literate but never unique. The standardized institution of the „list of the obligatory readings" manipulate us by all sorts of exemplary sanctions – from criticism that has adopted us wedged guilt, to judge us and takes us out of the „darkness of ignorance" and mental inferiority to swarm spiritual and social demiurges and volunteers who bristle if understand that we have not read some of the program tools and who chase us from their perimeter as „fools" and „lowbrows".

In fact, such intellectual totalitarianism has always been disastrous for the intellect and for the wisdom. The Doctrine „obligatory for reading books" is just a tool of the methodology of cultivation of the average citizen who should not has his time exclusively for personal antisocial

activities (such as solitary voluntary reading), nor with exceptional culture or taste for books. In today's painful lack of time „enrichment of horizons” with foreign and intrusive intellectual and evolutionary algorithms, orthodox, enduring and not actual, defines reading in the eyes of young people as social levelling ritual, as fetishistic uniform under the roof of a new, corporate information fundamentalist. Young readers of the 21st century know lists of great books (which the old worship), but are less worried by the fact that their greatness does not attract them. By which, they do not become uncultured.

4.15. Fifteenth problem: The absent axiological balance

The sociological surveys *do not check and do not report the axiological balance* in the attitude of the reading man – the amplitude between plus and minus. At normality as behavioural category, there is always a balance – two poles, two positions, two counterpoints. To exist white, there must be black. To exist love, there must be hate. But public consultation seeks only the favourite book. But we can have a favourite book if it is the other pole of the hate, the unloved. Because reading, as each psycho-social action has a double face – can be knees bent and can be cynical. It presumes too many embarrassing things – hiding, peeking, poaching, modifying, reformulating, compiling, comparing, to expose and manipulate, and with feeling – joyful and euphoric or ironic and sarcastic, or with vileness and disgust. In his power is not only the survival, maintaining of the vitality or the reanimation of any book, and the whole set of inhuman activities – ostracization, criminalization, killing or simply forgetting.

In other words, disadvantage of the sociological surveys and statistical reporting is the one-sided positivism and the lack of interest in negationism. They do not strive to identify and provide symmetrical „*the white“* and „*the black“* statistics. The indicator for normal, natural, balanced behaviour of the readers is missing. The modern reader would be enthusiastic about the opportunity to point also the *not read yet books, unwanted books, and books-wreckers, dangerous and hated books, the books he regrets to be read and books that he wants to forget*. The array of similar titles just would not be small. At various times they were penalized, lynched as unsuitable for reading and criminalized in the lists of banned books.

Classics as „Karlsson-on-the-Roof,” „Pippi Longstocking,” „The Catcher in the Rye", „Uncle Tom's Cabin” and „Harry Potter” have received a stigma of unreliability. The reason is that such strong books carry a maximum charge sufficient to activate the terminal reactions in unstable, unpredictable, risky reader. Voltaire directly put a sign „dangerous“ over 16 books from his personal library to separate the titles whose dangerous thoughts he had to disguise of the „reader-plebeian“. And aren't really readers who have committed crimes or fatal error, who curse the book affected them about it? Over the background of his counterpoint – the refusal of reading, reading would receive more weight.

In the conditions of the described sociological deficit, the world famous apologists of the book and the written word suddenly took up the theme of the book negativism with uncharacteristic for them liberalism. In 2006 Umberto Eco published a book where one of the essays is titled „*The unread books”* (Eco, 2006). Here the professor summarizes a consultation with intellectuals held on the book fair in Turin, with the question „Which books you have not read?” The volubility which the „normal,” „natural” and active readers answer with to this question, is both shocking and comforting, because it is clear that today there is nothing more logical to indicate without marketeering hypocrisy and false feeling of guilt, what are the difficult, unattractive, skipped and discarded personally by you books (among which are also titles of U. Eco). But such recognition for „paper negativity” in the previous conditions of expert literary totalitarianism, of dictatorship of the literary canon and erudition would not be possible, Eco suggests. „*The books we have not read“* is a theme that excites Umberto Eco again three years later, but now in his conversation with Jean-Claude Carrière. We learn from here who of the two great artists, what have not read. Eco has not read the whole Bible, the Indian epic „Mahabharata” and barely managed to read „War and Peace”; Carrière has not read „The Great Mon” by Alen Furnie; and the both admit that they have not read „Vanity Fair” (Eco, Carrière, 2011: 271-286).

An interesting fact is that it is the country which produces and distributes the most successful models to promote reading as a campaign „The Big Read“ – Britain, became a pioneer in restoring the balance between positive and negative reader activity. On March 12, 2007 for the first time in modern history we give voice to „unreadable books” tacit designation of „hated books”. British team of sociologists and academics summarize and publish the results of a unique survey „rating of

the unread/unfinished books" committed between 4000 adult Britons (Literary Saloon, 2007). It becomes clear that the resistance of the changing reader is no longer directed only to the factor „mandatory". The list of difficult and unreadable books include: the owned due to prestige (memoirs of politicians), the purchased from fashion considerations (the books of David Beckham, „The Satanic Verses" by Salman Rushdie), the bestseller („Harry Potter and the Goblet of Fire", „The Alchemist"), the award-winning book („Vernon God Little" by DBC Pierre, Man Booker Prize for 2003), classics („Odyssey", „War and peace", „Crime and punishment") and the unfilmed fiction. Now is not uncommon to have collections in the negative part of the spectrum in the net, for example: library of unbearable (hideous) books (Fletcher, 2010); top ten stupid, dully or traumatic books for children (Swaim, 2009). Seemingly vulgar and anarchic, readers' behaviour of active contemporary is more hygienic because the circumstances which press him are too unhealthy – lack of time, working till late, fatigue, difficulty in concentration, lack of patience and very unfriendliness of the volumetric, disorganized, uninteresting or forcibly written book.

The scientific community studying the current ecosystem of reading needs a survey to rebalance: to filter from the paper avalanche also those titles that cannot be read. Book market would be enriched and greening by a selection of *„books that should not be bought"*. However, for such a „hygiene of the book offering" pleaded also Oscar Wilde. He is famous for his phrase „to tell people what not to read is something quite different and I dare not recommend it as a task of the supplementary university program." Far from a joke is his covenant that who could select from the chaos of our times the „Hundred worst books" and publish their list, will do actually a true and eternal gift to the coming generation. Oscar Wilde said something else: „More than half of modern culture depends on what one should not read". We can recall for Geoffrey Chaucer, who has kept only 60 books in his personal library, but it was most valuable to him, most necessary for his personal culture. Every reader has his scale of good and bad books.

A key play in bibliopsychology is that the contents of the book is not physical, but mental category. Reading book is already psychological book. *As many are the readers of a book, so are its contents*, said in the early 20th century the Russian bibliopsychologist Nicholas Rubakin. This formulation suggests that any ambition for generalized assessment for conducting a „quality audit" of the attitudes towards books is meaningless and fruitless. There is no competence which „identifies" the message and perception of a book. If there is, it should be a „divine mandate". The judges of the reader and of the assessors of the readings need not surveys or interviews but linguistic, neuro-linguistic and psychoanalytic algorithms for expertise, for example, on sectarian and extremist (terrorist) books, but this is a topic of forensic and legal professionals.

Aggression of compulsory and complexes of „educated ignorance" expect its elimination. Global digital democracy emancipate the individual needs of severely active reader and his personal judgments about the „right", „important" and „logical" book. And it is increasingly normal behaviour.

5. Discussion: Why the social aspects of use are not reading?

Through empirical sociological methods (inquiries, surveys, questionnaires, interviews) *a distorted picture of the actual process „reading"* can be achieved. This is not a self-serving statement, but is made in the context of the warning of the social theorists of literature Robert Escarpit, that *the social aspects of consumption are not yet reading* (Escarpit, 1971: 88). His follower Julia Melentieva, a Russian library scientist and theorist of reading presents additional arguments to support this assertion. According to her, the today's most common method for the studying of reading – sociological, gives only limited knowledge of the so-called „external" side of reading, for its quantitative indicators because it stands aside the notion of the nature and the reasons both for the reading and not reading, for the deep mechanisms for inclusion of the child and the adult to it (Melentieva, 2012: 58).

Any deliberate approach that examines the units only in a definite aspect, only in terms of some of their signs, regardless of the sophisticated features that create their essence and individuality is a guarantee of distortion of information about them. It is this situation, says Elisabeth Noelle-Neumann, that reflect the *statistical surveys, by disregarding the autonomy of the individual and give a distorted view of the whole* (Noelle-Neumann, 1978: 39-45). The disadvantage of the surveys that are looking for the average numbers, average reduced numbers and relative parts in the field of reading and readers is particularly visible in the

interpretation of the indicator „time spent for reading". Even the competent sociologist-methodologist will rely with distrust to the averaging of the time of such highly individual operation as reading. The average minutes can be calculated only in some indirect way, manipulating the answers to the question „How long have I read today" or in the presence of a large number of respondents who is entrusted auto – photographing (over-complex and ambitious task) and provided that they have the same associations on the verb „read".

In a society of autonomous individuals we cannot speak *for the average reader* or *statistical averaging of information.* In a society of individuals cannot exist averaging of the individual readers' interests and of information needs nor *average effect of reading* on the recipient. All this will bear the scars of relativism and mechanical regimentation. Demoscopic results are the appropriate way to manage and manipulate the individual consciousness, no less than the anti-human so-called „Human Engineering". The information from the sociological surveys and the statistic data concerning the reader's behaviour is perhaps the long time searched „panacea" or the new Trojan horse of the manageable network society.

Why sociological methods can affect dysfunctional the knowledge about the real reader's situation?

First, the social sciences and studies of reading as part of them are currently experiencing a credibility crisis (Mackintosh, 2015). For example, accurate measurements from 2015 showed that 75 % of social psychology experiments cannot be reproduced. It is known that reproducibility is the defining feature of science (Open Science Collaboration, 2015).

Second, the *reader is not a social category, even less a „social role".* Because what is actually a role? The role is a common, uniform activity performed simultaneously or at different times by many people. In this sense, the social role is close to an acting role. The actor on stage does not recreate his own individuality but somebody else – of the character. The preferences in this case are to the imitation rather than to „individuation". But imitation is „extremely harmful for individuation", as we know from the theory of Carl Jung (Jung, 1993: 150). Generally, to accomplish a high level of social adaptation, the role is attached a mask, and the mask is placed when a man is overcome by shame, of fear of the others, or of fear for himself. Putting a mask requires a change in the posture, a new attitude to the whole thing. The mask is the ideal and the posturing – striving to achieve this ideal. This living social „game" may temporarily serve as cover of the depressing problems, but will inevitably lead to erosion of the individuality.

Third, *reading is introverted process.* According to the sociologist George Mead, for any intellectual activity, such as is thinking, and especially the thorough reading is typical „stopping of the behaviour", delay, postponing of the reactions (Mead, 1997: 361). If reader could look on himself, he would have registered alienation between mind and his own body. In a situation here and now his every observer, however actually recognizes his outside passivity and „absence".

Fourth, *reading is asocial activity*, where is made an alienating pattern of a detachment from the reality. It is done isolated; it is implemented invisibly (in the skull) and therefore is uncontrollable. Or, as the French journalist Bernard Pivot said, „when reading [the reader] is alone, fully and deeply immersed in the world of the book" (Pivot, 2005: 70). The reader is almost invisible to the sociological view and because the obstacle that the full depth reading is a process of self-communication. Also a well-known fact is that an important condition for the self-communication is the „social isolation", where is limited the quantitative participation of the subject in the social life and is „slowed the pace of utilization of the social facts" (Stefanov, 1988: 44).

Fifth, reading is a *waste of social time* and of intellectual energy of society, so is a *socially inefficient.* This is an assertion of the sociologist Stefan Kamenov in his academic research „The book and the reading" (Kamenov, 1988: 7). Hence the fear and the hatred disguise to the active readers comes from. In the report of UNESCO for the International Book Year in 1972 it was found that for the Third world reading is still considered shameful, criminal and reproachful act. African community condemns the act of the individual reading, the separation of a man with a book in hand immediately from the surrounding group is regarded as suspicious and is realized as a threat to integrity. I am not sure that today also in the most liberal societies, there is no such fear. Just the reading person is lost for the manipulators of the external environment.

Sixth, the reading remains unknown because it is *subversive mental practice* – subversive for the stereotypes and the power for all known and unknown totalitarian concepts. The reader

cultivates in himself a tendency to counteracting, anarchism, self-confidence, optimism and information superiority. A man reads not only to be different from others, not just to be original, to be always above them. He reads to overcome the boundaries of the community formed in front of the television screens to split the unanimity in it, to break simultaneity and transience of the TV show, once and for ever left in the past. Reading is the best way to divert standardization and vulgarization – all tending to stupidity – inherent in our highly technological age. Both the book and the reading bear the great cultural responsibility not to allow the mass communication to serve the individual sovereignty *contra-adaptive* and *anti-manipulative* under the pressure of the mass and the unifications. And these are again vested functions of reading as „dangerous" mental process.

Seventh, the reading remains unknown, because it is a *fail-safe filter against rhetorical and audio-visual manipulations*. In the act of reading the individual has time to cultivate and exercises his critical attitude, to operate with the information destructively, to dissect opinions, to compares, to collates, to denounce.

Eight, the readers only have the *capacity to change* – themselves, their environment, world. Who is familiar with the neurophysiology of reading knows that the reader develops not so much the „gray matter" but his shell – the cerebral cortex, i.e. freed himself from the animal dependence, from the genetically predetermined and trained in community (herd) models of behaviour. As his brain evolves from inside out, also the personality of the reader (already changed after he has just read the next page) develops and changes his environment from the inside out – absolutely decentralized, unsuspected and invisible to the „guards of the tower", surprising – somewhere from the bowels, sideways and upwards – as from an epicentre of an earthquake. Readers are unpopular and dangerous also because change their minds (only the cow does not change its mind because it does not receive information) and therefore made a dumping of the official theses and opinions. If the world should remain as it is today and now, the *readers are actually the most dangerous beings*.

6. Future research

In summary of the identified 15 problem of the sociological methods of the studying of reading, we can say that based on false picture of the reader situation the quantitative sociological methods have the potential to inspire negationastic verbal war against the new and young readers. An alternative to empirical methods for obtaining objective results on state reading and readers in any social moment is an integrative approach between „method of approaching" (method of bringing), „research involving" (survey method on survey participation), „included observation", scientific observation, introspection (method of self-observation), specific tests and measuring instruments (like test questions in TIMSS, PISA, PIRLS) and objective methods of bibliopsychology and cognitive psychology. Contemporary neuroscientific methods – bio-physiological measures (especially eyetracking), brain scanners, brain imaging or neuroimaging techniques, like electroencephalographic and functional magnetic resonance brain imaging (EEG and fMRI), transcranial magnetic stimulation (TMS) as methods to the study of mechanisms for reading should be included also (*see also* McCardle, Chhabra, 2004).

Rubakin's bibliopsychological method has a potential to reveal the objective preliminary data, because it doesn't use the usual empirical tools of the sociology or of the mass psychology. Because it proves, that the sociological criteria such as gender, age, education, social status do not provide adequate assessment in the relationship „reader – book", because it is dependent on other factors (biological, neurophysiological, cognitive), concerning the real process of reading. It is like this because it proves that the empirical sociology is helpless against the methods of the individual psychology, when it is speaking of prognosis in the field of the mass communications, marketing or the media production. Because it doesn't allows being speaking about the readers in average categories. Because it doesn't allow being speaking for mass reader, for mass reading, for reader's audience, and even more – for reader's mass. It disproves the usefulness of the mass plans and programs for reading. It disproves the collective lists for obligatory reading. It exposes the validity of the unified readings. It relativises the universality of the textbook readings and the generalization of the assessments of the official critics and academic readers. It dismisses the mass character of the reader's perceptions, of the reader's tastes and of the reader's interests. The Rubakin's theory of reading is a science of personalized attention towards the individual reader

(Rubakin, 1924). The bibliopsychology reveals the reader's unit as a unique receptive personality. In fact it can't exist correct and incorrect readings, postulates Rubakin – if the man reads as everyone else, if the result from his reading is identical to the result of everyone else, this is not normal. The bibliopsychological type reader is uncontrollable, because it is dynamic. His reader's interest is unpredictable, because it can be felt neither with the intuition, nor with the rigid senses of the external observer, nor with the mechanics of the marketing tools, but it requires personal testing of each individual reader. The reader's unit by Rubakin's is a micro world, that any from the known sociological research methods can't explain in fullness.

7. Conclusions

Due to the identified in the analysis problems, the critical researcher of reading should show a healthy scepticism about the sociological methods – polls, surveys, tests, questionnaires and probing. Reading is as an iceberg for the side spectator – 70% of the information on the nature of the process is under the water. Reading is not only invisible, silent, introverted and intimate mental process. Reading is unclear as a mechanism for the very active subject. That is why I say that when the reader is studied by verbal sociological methods he enters in a mode of respondent lie. The lie can be intentional, but it is usually accidental – the subject of reading itself does not understand how and when is reading. Verbal explication of empirical information – the response of the studied subject (respondent) will be unreal, unreliable and invalid. The situation with the reaching of scientific truth is complicated given that the researcher itself may not have the capacity and the training to overcome its individual connotations and personal ignorance about the survey phenomenon – reading.

According to the outlined development of the theoretical conventions for the phenomenon of „reading", the qualified researcher should treat it as non-temporal activity and as a media reception beyond the contact with the alphabetic texts. Under the current discourse about the new literacies reading should be studied as a process of mediated information, not necessarily implemented with letter symbols and not necessarily accepted by eyes (tactile reading at the blind people).

Qualified reader in the role of researcher will be marked by moderate scepticism to sociological surveys, although he doesn't mind to verify the theses with an empirical inquiry conducted by survey or voting. It is no accident that when criticized Henry Ford, that he is not interested in market sentiment, he responded: If I had listened to the voice of the customer, I should create no car but just a cart with faster horses. And the President Harry Truman had such an expression: if Moses had read surveys, he would stay in Egypt.

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9. Conflict of interest statement

The author declare that there is no conflict of interest regarding the publication of this paper.

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The History of Education

Pedagogical Foundations of Effective Reading Instruction Older Students in Russia in the late XIX – Early XX Centuries

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Abstract

Topical issues of development of reader's activity of school students are considered on the basis of the comparative analysis of the situation characterizing a technique of formation of communicative competence of the system of gymnasia formation of the Kursk province of the end XIX – the beginning of the XX centuries. The comparative-historical and theoretical analysis of the sources characterizing features of statement and a solution of the problem of training in reading in domestic pedagogics at a boundary of XIX – the XX centuries, are the main methods of work. Generalization, systematization and classification of material are methods also. The main types of reading characterized by methodologists of the specified period as "serious" and "easy", private and obligatory are allocated. Differences of a modern and historical methodical thought in the relation to reading in the system of training of school students are traced. The key principles of effective training in reading the school student (nature conformity, activity approach, presentation, communication of training with life, anthropocentricity) are distinguished. Article can be useful to teachers-language and literature teachers, methodologists, students concerning training in conscious productive reading school students.

Keywords: productive reading, school students, education, the end of XIX – the beginning of the XX centuries.

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1. Introduction

Identification of factors of successful training in conscious productive reading modern school students is one of key problems of modern pedagogical science.

Works of outstanding scientists of the end of the XIX beginning of the 20th centuries (the historical period, similar in economic, political, sociocultural indicators), articles of the periodicals which were so actively developing in the specified time period and also archival materials show the high level of reader's activity of all segments of the population, enormous work of the conceiving part of society in formation of the competent, thinking, well-behaved reader.

Therefore the appeal to the above-stated sources, their comprehensive analysis will promote the solution of problems of formation of the active reader, functional literacy and increase in the general cultural and educational level of the modern school student.

2. Materials and methods

The historical principle of a research of material is the cornerstone of work. It assumes consideration of the pedagogical facts and phenomena in specific historical conditions, that is taking into account the economic, cultural and political level of development of society. Thus, culturological material allows to cover rather fully the sociocultural phenomena and to draw the generalizing conclusions. System approach demands studying of social and educational structures in their interaction and interference.

The interdisciplinarity provides the addressing concepts of interdisciplinary sciences.

The comparative-historical and theoretical analysis of the sources characterizing features of statement and a solution of the problem of training in reading in national pedagogics at a boundary of XIX – the XX centuries are the main methods of work. Generalization, systematization and classification of material are methods also.

Publications of the famous scientists and public figures in periodicals of the considered period, their scientific works and also the archival materials consisting of circulars of the Ministry of national education, orders of trustees of educational districts, protocols of faculty meetings and reports of teacher's congresses make source study base of article.

3. Discussion

The problem of reader's activity is closely connected with questions of functional literacy. Reading qualitative literature is complicated without sufficient level of proficiency in language (this fact is obvious to all in a case with a foreign language). Therefore interest in reading is small or is absent at poor knowledge of language.

The role of the native language in education of the personality was also emphasized by teachers of the end of the XIX beginning of the 20th centuries. Each advanced work of that time reflected K.D. Ushinsky's thought: "The child does not understand sense of a word and its true value, will always suffer from this radical shortcoming when studying any other subject if it does not understand it" (Ushinsky, 1954). Therefore "… the school has to attach to the native language significance of the central subject. Each lesson has to be a lesson of the native language" (Bunakov, 1906).

The same ideas are consistently reflected in I.I. Sreznevsky's works (Sreznevsky, 1899), V.Y. Stoyunin (Stoyunin, 1986), V.I. Vodovozov (1958), circulars of the Ministry of National Education and decisions of faculty meetings of educational institutions.

Thus, key position of the put methodical base in teaching literature at a turn of the 19–20th centuries this attention to the native language, its high-quality studying, its priority over all other sciences in which train younger generation.

N.F. Bunakov's remark is also for us an important conclusion. "Studying of literature brings up and develops the pedagogical strength of workers of teaching and educational business, gives it necessary coloring of nationality, but in the meantime gives to these workers and important material for the bringing-up impact on younger generation" (Bunakov, 1906). The sense of reading and training in reading seems in it.

Modern researchers do not lose this important idea. "Importance of early reading becomes obvious at the appeal to intertek-stualnost problems for formation of collective cultural memory. Program school texts act as implications much more often than other layers of classics" (Leybov, 2013). It would seem, such judgment is contrary to data of sociological polls. After school people do

not address program works (52 % of respondents). But basic works and authors (symbols of the Russian literature) were strongly included into consciousness interviewed that becomes visible from other researches of public opinion.

4. Results

Search of an ideal, relevance, support on modern samples, careful sampling are the main directions of implementation of development of reading teachers at the end of XIX – the beginning of the 20th centuries, provided not only interest in literature, but also development of the reader, his education in the spirit of civil patriotism.

Documents of the Kursk men's gymnasium of the end of XIX – the beginning of the 20th centuries were analysed by us.

The character of the studied materials (circulars of the Ministry of national education, the Trustee of the Kharkiv district, the reference to Decrees of the Emperor, the approved training programs and plans) allows to draw the generalizing conclusions about importance of the considered problem.

Exclusive concern of government officials and teachers in extent of assimilation and understanding of data by pupils pays on itself special attention. Personally focused approach is obvious. The attention of the teacher not only is concentrated on educational opportunities of training, but also turned to the identity of the school student with his emotional and creative features and opportunities of development.

Success of personally focused training is put into direct dependence on quality of reading educational and additional grants. Linguistic disciplines gained paramount value in the Kursk men's gymnasium at the end of XIX – the beginning of the 20th centuries. The key ideas of documents of different level (from circulars of the Ministry to reports) this development of comprehensiveness of the identity of the pupil when training in language; compliance to age and level of development of materials of lessons (any cycle). So, for example, the Circular of the Ministry of National Education to the Trustee of the Kharkiv educational district of June 8, 1877 says that the best results on classic languages can be achieved by means of the various reading and a serious explanation read" (The Circular, 1877). Masterpieces of the Russian literature are ready material for exercises on language.

The trustee of the Kharkiv district in the Circular of December 10, 1899 points to positive impact of reading on thinking and also counteraction to "the superficial reading characteristic of youthful age" (The Circular, 1877).

The same judgment is reflected also in the Circular No. 17458 of September 1, 1905. The analysis of the contents read needs to be carried out at Russian lessons besides performance of grammatical tasks: "to note and transfer the main thoughts, to establish connection between them, etc." (The Circular, 1905).

Changes in programs for Russian and literature were carried out according to indications of the Ministry of national education. The quantity of lessons of these objects increased, their theoretical and practical base changed for the purpose of all-round development of pupils (The Circular, 1877).

The teacher of Russian of the Kursk men's gymnasium P. Shandybin noted in the report that the taken measures gave the chance to find more time for explanatory reading articles not only from the textbook, but also from the periodic children's press (In the same place).

Archival documents of the Kursk men's gymnasium convincingly prove learning efficiency of children by means of educational books K. Ushinsky, N. Bunakov, V. Vakhterov, V. Vodovozov, N. Korf, D. Tikhomirov.

The questionnaire of "A measure for development in pupils of interest in out-of-school reading" pays on itself special attention. Answers to it are kept in archive both in draft, and in the corrected option that can testify to importance of data according to this questionnaire. This questionnaire gives information on a condition of reader's activity of grammar-school boys. Public services are more anxious with the "correct" orientation of reader's activity. So, need of drawing up "preliminary lists of books for reading", plans of "literary soirees" and also maintaining protocols of literary conversations and scientific readings especially makes a reservation. Cool written works; literary conversations on subjects, "chosen as pupils voluntarily, but under the leadership of the teacher"; self-education circles (mathematicians, historians, fans of classical antiquity,

estestvennik); literary holidays "with demonstration of light pictures and experiences"; excursions were called fixed assets for development of interest in "out-of-school reading, self-education and amateur performance" (The Circular, 1892). Thus, we are convinced that it is about the organization of interest in reading.

We learn from this questionnaire that the studying gymnasiums actively participated in literary conversations, they showed most of all interest in questions of literature and history and also modern events" (The Circular, 1892).

At a boundary of the XIX–XX centuries teachers spoke about orientation of reader's activity (the "serious" and "frivolous" reading, obligatory, recommended and additional, program and private) and even its restriction. "The correct statement of reading will render to the person service for the rest of life", - L. Ilyinsky claimed in the report at a meeting of the Faculty meeting of the Kazan Kseninsky female gymnasium. The teacher was sure that it is an easy problem as the school "deals with youth which feeds special love for the book … looks for in the book of a response to completeness of the spiritual life … the pupil spends all power of sincere emotions for the book" (Ilyinsky, 1913).

The reader's activity of grammar-school boys was so high that the enthusiasm for additional reading had negative effect on success in other objects" (In the same place).

The same assessment meets and graduates have gymnasiums. So, one of examined, Ivan Samotoy, 1878 of year of birth, wrote in the autobiography: "In the third class I so was fond of reading that I was even wanted to be dismissed from school". And further: "I read on vacation everything that could get houses owing to what spoiled sight" (The Circular, 1892).

Curriculum vitae of other graduate A. Ostenberg, 1880 of year of birth, also demonstrates his erudition. Each paragraph of the story about itself contained the quote from the Russian and foreign classics reproduced on memory.

The biography of the school student M. Pozhidayev, the miller's son, contains the next lines: "The teacher gave a taste me for reading, this only means for the rural boy from surrounding darkness to escape to light". And further: "Reading was for me at night the only joy as was once in the afternoon or this luxury was not allowed us" (The Circular, 1892).

The teaching staff of the Kursk men's gymnasium sought to control a circle of reading the pupils, to order lists of references, to distribute them according to age and educational qualification, following an official position of the state.

The minutes of the Faculty meeting of the Kursk men's gymnasium sometimes devoted only to reading are of great value for consideration of a subject of this article.

So, the meeting of the Faculty meeting of October 13, 1893 is completely devoted to "a question of the expedient organization of student's libraries and the correct statement of house reading pupils". The director indicates the need "to expand tasks of library, having assigned to it a duty to direct reading pupils as school students read too much and irregularly. It negatively affects education and development of pupils according to teachers of a gymnasium (The Circular, 1893).

The direct instruction on an exception of the studying 1–2 classes (age of 9–12 years) from among using student's library is available in the minutes of September 27, 1891 as:

- first, the library has no books satisfying needs of children;

- secondly, libraries are not prepared for independent reading,

- thirdly, reading "not on age" does this reading "unproductive and … harmful, installing in reading self-conceit, arrogance" (The Circular, 1893).

The decision on drawing up the list of books by "exemplary writers" on classes is approved by a faculty meeting of October 13, 1893. This list will become a basis of the created cool catalogs. Three lists of books are created: 1) books at the free choice of pupils, 2) books in which separate articles are recommended for reading; 3) reference books. A recommendatory, but not binding character of these lists especially made a reservation. "Any coercion will be dangerous as it will be felt at once by pupils and will send them to private libraries". Private libraries are not controlled therefore it cannot be allowed (The Circular, 1893).

Thus, anthropocentricity of methodical system of teachers of the Kursk men's gymnasium of a boundary of the XIX–XX centuries is available.

Need of inclusion in the specified catalogs of serious books is defined. For example, teachers recommended to pupils historical and critical sketches of Strakhov, capital work of Belyaev "Peasants in Russia" and others (The Circular, 1893).

In general, reasonings on "serious" and "frivolous" reading are very relevant for the Kursk men's gymnasium from the point of view of methodical, educational and from a position guarding, political at the turn of the century (especially in documents from 1905 to 1916 that logically is explained by the known historical events).

Conservative remarks of teachers of the language and literature teachers supporting reading classical samples instead of novels meet (The Circular, 1893).

The history record of the Faculty meeting of November 17, 1893 is also completely devoted to reading school students. It most fully characterizes a methodical position of a gymnasium on the specified question. "The director specified that reading the last sort, kind of it was desirable, nevertheless cannot be made officially obligatory" (The Circular, 1893).

The reservation on "not compulsory" character of the measures undertaken for the direction of reader's interests to the desirable course several times became. However reading "insistently necessary" articles was approved by the teacher in a class as methodical reception. A task of the language and literature teacher it to draw the attention of wards to books, "more useful" for pupils. A certain compulsory character can be seen only in it (The Circular, 1893).

Need to divide reading on "private" and "obligatory under the leadership of the teacher" arose at methodologists of the Kursk men's gymnasium. They tried to define measures for regulation of this process, paying attention to the casual choice of the books demanded from libraries. Pupils ask this or that book according to instructions of relatives, acquaintances. Often, according to teachers-language and literature teachers, required literature does not correspond to either extent of development of pupils, or requirements of their age. Pupils take "serious" literature a little. Teachers connect it with restriction of their opportunity to influence the choice of pupils (the Circular, 1893). That is why the application for textbooks and additional literature (art, informative and periodic) becomes so important action that demands several meetings of faculty meetings.

Much attention by drawing up applications is paid to quality of books (font clearness, a condition of paper, lack of mistakes and typos) and convenience of pupils (numbering and execution of sections, numbers of tasks has to remain and also the obligatory instruction on the made changes in the republished books).

The main issue of one of meetings of the Faculty meeting of the Kursk men's gymnasium is improbable for today's education system. Decides whether all students can use library or this privilege will remain only for excellent students. Serious decision. The right of use of library and an opportunity to read at will are left only for in the time school students. Arguments were adduced the following. First, reading distracts from study. Secondly, excessively developed imagination of certain pupils suffers from reading novels. Thirdly, families of problem pupils do not support teachers in respect of control. Therefore, reading will be uncontrolled. Pupils will not be diligent in the doctrine.

However an opportunity to return the right of use of library is present at the protocol provided that "the teacher of literature in coordination with the cool mentor can petition for permission" if increase in level of the general development of the student is observed (The Circular, 1893).

Teachers-language and literature teachers were sure that the pupils who were not differing in educational abilities were not absolutely bad. Besides, they hoped that reading will develop in them and "some inquisitiveness (The Circular, 1893). The management of a gymnasium reminded employees what the Ministry of national education demanded not to allow from teachers of literature of criticism and unnecessary literary and historical details at a lesson, "but did not wish to limit all knowledge of pupils to a close framework of the textbook at all (The Circular, 1893).

Thus, the thoughtful, competent, methodically verified position is presented before us once again. She observes respect for the pupil and the teacher. Such bases allowed to maintain reader's activity of grammar-school boys, to achieve good results in development of the program of humanitarian objects. Even state regulation of the above-stated processes had not negative effect on formation of communicative competence of students and allowed to release competent, erudite, esthetically and spiritually developed young men with an active civic stand.

5. Conclusions
The Russian bibliologist N.A. Rubakin claimed: "... nothing so characterizes extent of social development, degree of public culture as level of the reading public at this historical moment" (Rubakin, 1975).

Level of the reading public is defined by its valuable reference points. The turn of the 19-20th centuries is characterized by leveling of ideals, habitual for educated public, and also need clear and close to the new reader (from the people) ideals. Well-known thesis "Orthodoxy. Autocracy. The nationality" demands new meanings, and even other concepts. Search of new ideals is followed by the addressing the printed word, and more (if to speak about the formed or studying public) – to a word art. Art text assumes more wide range of values, meanings, treatments. The figurativeness of the art text allows to see, realize also what was represented, endured by the reader at the level of subconsciousness, to determine own opinion by the presented problem. In such context concern of government, teaching, parental, student's circles the about maintenance of the published literature becomes clear.

Summing up the result, we mark out once again the key principles of effective training in reading the school student at the turn of the century:

- nature conformity,
- activity approach,
- presentation,
- communication of training with life,
- anthropocentricity.

Any of these provisions is not new to today's methodologists, however their practical application at the end of XIX – the beginning of the XX centuries was based on the most powerful ideological and cultural basis. The active civic stand, the highest level of cultural and esthetic development of society predetermines formation of high moral ideals which singers are classics of the world literature.

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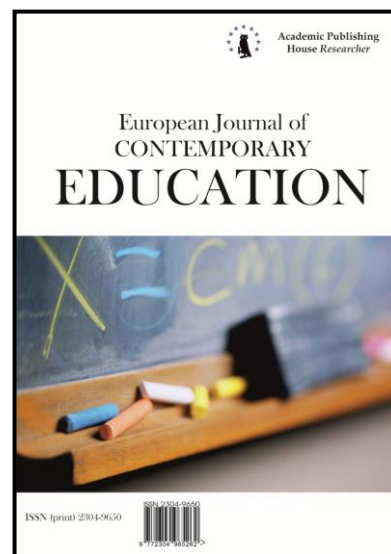
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Teaching Singing in the Russian Empire Educational Institutions: Importance and Results

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Abstract

The article deals with the system of Singing lessons in the educational institutions of the Russian Empire. Attention is paid to the historical and educational significance of musical and choral training in schools, the difficulties and methodological approaches in teaching.

Pre-revolutionary, Soviet and modern scientific literature was used as materials. The methods of research were the principles of objectivity, historicism, systemic, complex consideration of social subjectivity in the subject of study, the maximum possible neutrality of the researcher towards the interpretation and evaluation of the actual material was assumed. The use of these methods allowed the authors to consider the system of singing lessons in educational institutions in retrospect and in historical sequence.

In conclusion, the authors note that singing had a great importance in the Russian Empire. Traditions and teaching of singing ascended to the ancient history of Russia and played an important part in the spiritual life of society. In the middle of the XIX century, singing was taught in primary schools in Russia, but due to the complex system of teaching, the progress of students was slow. In the 1870s, the teaching methodology based on the analytical-synthetic method was changed, which made it possible to dramatically improve the quality of teaching.

Keywords: Russian empire, folk school, singing.

1. Introduction

Singing was a significant part of life in pre-revolutionary Russia. Important seasonal holidays (especially in spring and summer) as well as church celebrations were accompanied by songs. It is also important to note that young people in Russia were playing dances with songs. Starting in the

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beginning of the fall, they continued until Red Hill day (the first Sunday after Easter). Dances in circle were a part of pagan tradition.

The Orthodox Church provided patronage to the religious songs, by creating parishioner church choirs. Singing was one of the educational disciplines in the period of Kiev Rus. Thus, in the Kiev Women's College, founded in 1086, singing was one of the compulsory subjects (Miropol'skii, 1873).

2. Materials and methods

Pre-revolutionary, Soviet and modern scientific literature was used as materials. The methods of research were the principles of objectivity, historicism, systemic, complex consideration of social subjectivity in the subject of study, the maximum possible neutrality of the researcher towards the interpretation and evaluation of the actual material was assumed. The use of these methods allowed the authors to consider the system of singing training in educational institutions in retrospect and in historical sequence.

3. Discussion and results

Teaching singing in Russian (including Soviet) historiography was considered since the middle of the XIX century. In the pre-revolutionary period, this topic was given attention by such specialists as: V.F. Odoevskii (Odoevskii, 1868), O. Gutman (Gutman, 1899), O. Miropol'skii (Miropol'skii, 1873) and others. The authors were searching for new methods in singing tutoring.

In Soviet period, the peak of vocal pedagogy studies took place in the 1950–1960s. At this time the pre-revolutionary method of teaching music was improved and simplified. These issues were studied by recognized experts, such as V.A. Bagadurov (Bagadurov, 1953), Y.A. Barsov (Barsov, 1968), E.Y. Gembitskaya (Gembitskaya, 1955), D.L. Lokshin (Lokshin, 1957) and others.

In the XXI century, the teaching of singing in the pre-revolutionary period were reflected in a number of works, among which it is necessary to name the studies of: N.V. Gruzintseva (Gruzintseva, 2016), M.V. Komissarova (Komissarova, 2015), L.V. Chernova (Chernova, 2016), E.I. Kislova (Kislova, 2015), I.V. Kornilova (Kornilova et al., 2016) and others. In this period, the authors focused on the history of pedagogy and the evolution of methodological approaches in teaching.

The pedagogical significance of music in general and singing in particular is determined by the strong influence of feelings on one's spiritual life. It is necessary to understand that music is mainly the language of feelings, not only personal, but also universal; embodying emotions, the song serves as an expression of the elements of the inner life of man in society and of the society itself. In the pre-revolutionary period, teachers believed that one can express his deepest feelings and noble aspirations through a song. The moral significance of singing was not only in teaching a person, but in "tuning" a person to his best manifestations and impulses.

At the same time, singing could have a high national importance, but the basis of folk music education had to be native songs and prayers. That is why the national anthem of the Russian Empire was the song-prayer "God save the Tsar". This song was the embodiment of the history of the people, the bearer of the foundations of national education. In it the society expressed its' past, its' views on life and hopes. It should be noted that the song played an important role not only in Russia, but also in other countries. Thus, for example, in Germany, choral societies had a "cementing" significance in the unification of German societies (Gei, 2014).

It is important to note that musical education was of purely practical importance. Song and music, filling the leisure time on holidays, served as a distraction from drinking establishments and the increasing rate of alcoholism (Kuz'mina, 2015: 93-97).

Finally, the introduction of proper musical education could help to improve Russian church singing and served as a support for the school. For example, the society was more sympathetic towards singing and if the choir participated in the church at the school, the school acquired higher public authority.

In the first half of the XIX century, Singing as a basic subject in schools was in decline. The reason for this was the prevailing opinion that not all students had the talent for singing. The situation changed since the Great Reforms of the 1860s, when singing was included in compulsory subject in the curriculum in practically all schools, as well as in the cadet corps of the Russian Empire (Cherkasov, Smigel, 2016).

Exemption from Singing was allowed only if the student experienced soreness, weakness or pathological deviations. But all these cases were very rare in educational institutions. It is important to note that Singing classes, among other things, were an effective tool for correcting speech defects, so-called tongue-tie and stammering. In addition, it should not be forgotten that voice and hearing, like other abilities, could be developed through methodological training and systematic exercises.

By the 1870s, the teachers of Singing were puzzled by the question: "From what age should we start teaching children Singing?"

It is common knowledge that children begin to sing very early. While in the cradle, by falling asleep to the sound of a lullaby, the child got used to calm singing. Since then, his hearing began to develop, although he did not yet distinguish individual sounds in the song, but perceived the song as a whole.

With the development of the body, the strengthening of the vocal organs began as well as speech and singing skills (which were formed by imitation). At the age of 5-6 the child began to sing along. The gradual development of a child's voice can prove that apart from special cases of musical giftedness, which is an exception, a child's voice is formed not earlier than in the period of 8-9 years. From that time the singing teaching began in pre-revolutionary Russia. It was noted that in kindergartens children were taught singing at an earlier age, which, with the right choice of plays, is quite possible. However, teaching singing before the specified age was not recommended (Miropol'skii, 1873: 7).

By the 1870s, the question of the preference for solo or choral singing was on the agenda in primary schools. It is important to note that teaching singing was much simpler, since it represented the initial way for the development of the basic elements of singing. However, without choral singing, it was incomplete. Surprisingly, choral singing caused objection even among music teachers of primary school. The arguments of these teachers amounted to the following: 1) there is no time for choral singing in primary school, 2) this type of singing is difficult for pupils, 3) assuming artistic development, it is impossible in school, and finally, 4) where to get voices for choir in school?

It was parried by teachers-innovators that 1) if there is a place for singing in elementary school then there must be a choral one, since these are not separate lessons, but joint ones. Beginning with solo singing, it was time to move on to choral singing, 2) the problem of the difficulty of choral singing was more of a teacher's problem of singing, since it was completely incomprehensible. If one student could sing a tune, then why he could not sing it if somebody sings along? O. Miropol'skii, attending singing lessons in primary schools noted that "singing in two, three voices gave them (children – Auth.) the greatest pleasure and they eagerly performed in choir" (Miropol'skii, 1873: 9).

In the 3rd point opponents of the introduction of choral singing noted that children cannot develop artistically. However, innovators considered this fact to be an exaggeration. They noted that the first stage of performing music is the correctness of singing; if the students sing for the first time and achieve it, then some kind of ensemble can be heard in the choral singing. Technical endurance, subtle nuances, grace, high artistry of performance were the result of long practice, and it would be strange to demand these qualities from children.

As to the fourth point the innovators reported that their Singing lessons did not set the task of staging opera performances. In singing, the combination of several voices will lead to choral singing and elementary singing did not require a considerable number of voices. Summing up, advocates of choral singing noted that there is time, money, and a complete opportunity to introduce choral singing in primary schools. Choral singing had a positive influence in education in its development of teamwork skills, in the realization that only together one can achieve the goal, forming a habit of carefully performing one's own activities and coordinating with the others. The competitive spirit was also important as well as the understanding of proportion, tact and harmony.

A few words about the method of teaching singing in primary school.

In the middle of the XIX century, teaching Singing was considered difficult because it required a creative approach from the teacher. Prince V. F. Odoevskii[*] wrote that "all music is

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[*] Vladimir Fedorovich Odoevsky (1804–1869) – music theorist, prominent Russian scientist and writer.

nothing but a series of compounds of the seven basic quantities and their derivatives" (Odoevskii, 1868: 5). Similarly, the drawing was a mix of a straight line and a curve, and mathematics was a mix of 10 basic numbers. In the end, it was V. F. Odoevskii who developed a method of choral training (Chernova, 2016: 25).

Professor Laroche, in his preface to the manual for Sheva's method singing lessons, noted that it might seem paradoxical that all musical knowledge and skill is reduced to one main feature: "the ability to intone" that is, "to imagine in proportion, to picture with a voice a sound represented by a sign on paper". Thus, all the music, in technical language is based on intervals. If you take into account that there are 7 main sounds, and the 8th is the first repeated twice, that there are 7 basic intervals, and the remaining derivatives, then the understanding of the musical literacy should not even seem complicated.

A few words about the methodology of teaching. By the 1870s, there were two methods of teaching singing: synthetic and analytical. The peculiarity of the synthetic method was that the pupils first learned musical sounds, in the form of a scale, then went on to more complex musical exercises, then to whole plays, and the acquisition of music competence skills was complete by learning.

When teaching in an analytical way, the learning process was reversed. At first, the students learned a few simple plays by ear, which later served as teaching material. Methodists noted that the children, both in speech and in song, did not distinguish the elements at first, but perceived them as a whole. Under the teacher's guidance, the students split the whole into elements, into separate sounds that differed in height, strength, and continuation. Thus, in a synthetic way, learning begins with elements and escalates to the plays; and in the analytical way it starts with whole plays and moves down to elementary sounds.

In the process of singing teaching in Russian schools, the synthetic method dominated, despite the fact that it was more appropriate for special education and is hardly applicable for primary schools. As a result, the music system was first taught in schools, and then, scales, keys, intervals, and so on. Accordingly, in the routine study of textbooks, the teaching of singing went on by itself and this was the reason why singing was not perceived by all students. By the 1870s, Russian teachers developed a more simplified system of teaching. The core of it was the analytical method that was supposed to simplify the learning process and make it accessible to everyone. In the end, this method existed almost until the 1950's and later was slightly updated (Chernova, 2016).

Innovations suggested that the teaching of singing should begin with preliminary exercises. Their goal was: firstly, to get acquainted with children's vocal abilities and their readiness for singing; secondly, to prepare the development of hearing, tact, voice intonation and the ability to distinguish high and low tones; thirdly, to prepare the material for further learning; fourthly, to teach the children to write the first 7 digits to write notes and to familiarize children with the school system.

As you know, the first impressions are the strongest, and so the teacher from the very first lesson should try to involve the children in the learning process, to inspire their confidence and assure them that learning to sing is not a difficult matter.

After acquaintance with the students, the teacher had to make friends with the children. He had to find out what songs they knew and what they liked. This was done so that the children could overcome their shyness and awaken their spirit of competition. To practice the intonation it was necessary to "get into the voice" of the teacher. The tact and proportion would appear later during the performance of songs. The choice of songs should be adapted for further work, while it was important that the songs had a distinctly simple diatonic scale. The writing of the figures should go along with the oral exercises.

The core of all training was to be based on an analytical-synthetic method, and the fact always had to precede the conclusion, an example had to precede the rule and particular had to precede generalizations.

After preliminary exercises, it was important to lead the students by asking them questions to help them to analyze and write down in notes the songs they learned. At the same time, their skills were especially important as well as resourcefulness and inventiveness of the teacher. Further progress of the studies depended on the success in the independent analysis of the first song.

General recommendations were given for effective learning by a new method of elementary (simplified) teaching:

1.   Simple, but graceful melody and text, should be used as basis of the entire period of learning, gradually increasing difficulties in intervals, tact, tempo and voice range;

2.   Oral and written work should be alternated, but oral ones should be preceded by written ones. If the student is able to sing from memory, he should be able to write down what he heard;

3.   Theoretical information on music should be given gradually, in performing and learning the melody and it should be immediately "fixed in mind" with new examples. Thus, there was no need to talk about additional octaves in the main scale, if they did not occur in the studied song.

4.   It was especially important that children learn to picture every given sound in mind. For this, the best means were musical dictation and note reading. Both of these exercises had to be used in the training course. Pupils should hear and guess intervals and write them down; each digit (note) should serve as a sign of the real sound for them. Exercises could vary. For example, one student, calls out a note aloud, the others sing it, while the others write it down. The main thing was that in each task the student must certainly delve into it, listen to the sound and reproduce it or seek it out by himself. Only with this method of teaching singing could develop and give results.

5.   Along with the melodies (prayers, hymns, songs) there should be exercises in performing musical sounds by numbers with the names of notes: do, re, mi, etc.

6.   All exercises should have a meaningful character of elegant melodies, and not be routine-monotonous imitations of mechanical combinations of musical sounds or meaningless compositions.

7.   As soon as the children learn to perform simple plays correctly and clear, in the average tempo with the simple division in tact, when they will learn to distinguish and apply their knowledge, it was necessary to proceed to two-voiced singing. Canons served as transition from solo to choral singing, with less difficulty in performing, due to their construction (Miropol'skii, 1873: 17-18).

The simplified notes studying system played a significant role in musical pedagogy for a long time (Chernova, 2016: 27).

4. Conclusion

In conclusion, it should be noted that singing had a great importance in the Russian Empire. Traditions and teaching of singing ascended to the ancient history of Russia and played an important part in the spiritual life of society. In the middle of the XIX century, singing was taught in primary schools in Russia, but due to the complex system of teaching, the progress of students was slow. In the 1870s, the teaching methodology based on the analytical-synthetic method was changed, which made it possible to dramatically improve the quality of teaching.

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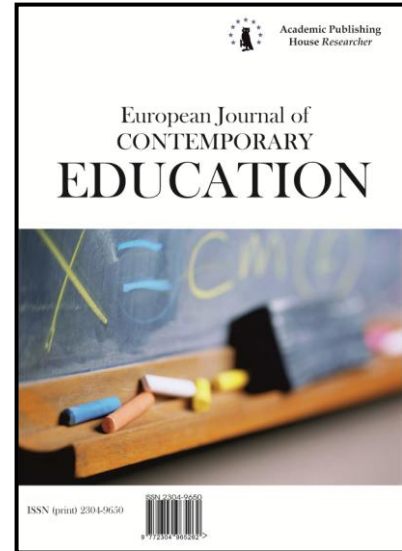
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Public Education in the Russian Empire at the end of the 19th century

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Abstract

The paper reviews primary education in the Russian Empire at the end of the 19th century. It focuses on describing the successes and shortcomings of the public education system, as well as identifying the causes of its poor efficiency.

As a summary, the authors concluded that the government of the Russian Empire consolidated major efforts to improve public education since the mid-19th century. At the same time, it is important to note that the government was not only committed to educating the population, but it also prioritized the role of parochial schools in the process, which paid much more attention to the spiritual and moral component. This is why significant numbers of parochial schools were opened across the Russian Empire, and the institutions enjoyed funding from the state treasury. On the other hand, schools in the system of the Ministry of Public Education, as well as zemstvo (zemstvo – an elective council responsible for the local administration of a provincial district in czarist Russia) and city schools financed by these communities, grew at a much less marked rate. In general, by the end of the 19th century, Russia achieved the encouraging progress in public education, and the transition to universal education was only a matter of time.

Keywords: public education, Russian Empire, the end of the 19 century, parochial schools, public schools, literacy schools.

1. Introduction

At the end of the 19th century, the system of public education was represented by general and technical (vocational) types. Each of them included primary, secondary and higher education. However, the term "public education" was more relevantly used for general primary education. Public education made a rapid advance in the European states in the 19th century. At its heart, the

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phenomenon relied on the principles of general availability, compulsory attendance and free-of-charge basis.

It is important to note that endeavors to implement these principles faced considerable difficulties. For example, ensuring availability required creating a sufficient number of public schools and efficient development of the school network. Providing the population with schools, as well as their optimal territorial distribution implied active involvement of the government and significant allocations from the state budget. In terms of the laws, the government delegated the task of organizing the appropriate number of schools to self-governing communities. This responsibility was placed on communities in countries such as Austria, Hungary, Spain, Sweden, Norway, Denmark and others.

Speaking of compulsory public education, European countries widely used coercive measures in the 19th century as economic incentives were not enough to bring the principle to life. Already in the middle of the 19th century, it was found out that to make public education universal, children should be taught on a compulsory basis. It is essential that the economic conditions in which the vast majority of the population lived in Europe brought about the use of such practices as child labor which was very cheap. European countries took into account that in the matter of public education they could not rely on adults caring about their children, and this dictated that public education should be recognized as a compulsory practice. By the end of the 19th century, this approach was accepted virtually by all European countries. However, this was preceded by years of efforts by entire generations of intellectuals. In the USA, they saw a similar situation. It first introduced compulsory public education in Massachusetts in 1856, then in Colombia in 1863, and by 1892, compulsory education for children was made a law already in 27 states.

An important driver contributing to the spread of public education was its free nature. By the end of the 19th century, the system of compulsory public education provided that school fees were taxes imposed by the state along with the personal obligation of giving education to children. The practice of levying school fees as a tax could not be justified in any way. In this context, public education was declared compulsory as it constituted a state need, rather than that of parents or educators. This created conditions for the wide distribution of public education in many civilized countries. By the end of the 19th century, education was free in many countries across the world, namely: Switzerland, France, Russia, Italy, Portugal, Romania, Norway, Bulgaria, Serbia, Germany, USA and others. School fees were collected in Prussia for a long time, but the country also abolished them by 1889. At the same time, the UK had no free education, but, in fact, its primary school could be considered almost free thanks to parliamentary subsidies granted only to the schools that took no fees.

2. Materials and methods

The materials used include pre-revolutionary statistical data collected by departments and ministries, reference literature, as well as academic studies and dissertations, which addressed issues of public education in Russia at the end of the 19th century.

3. Discussion

In the post-Soviet period, academic interest in the history of pre-revolutionary public education increased significantly. Various research works were published, which studied the role of: the Ministry of Public Education (Myatnikov, 2005; Appoeva, 2008; Zhegulskaya, 2008; Cherkasov, 2011; Ovchinnikov, 2006) and Most Holy Synod (Cherkasov, Smigel, 2016) in the field of primary education. The works (Shevchenko et all., 2016; Kazakova, 2009) put specific emphasis on the development of primary education and teaching staff in various governorates of the Russian Empire. The authors of these studies published significant statistical materials, reports, findings of the Russian Imperial Census of 1897, which reflected the issues related to the literacy of the population. Speaking of pre-revolutionary studies, we should mention the work by N. Andreev (Andreev, 1916).

4. Results

The issues of public education were systematically addressed in Russia since Peter the Great. It is known that the reform-minded tsar aimed to make professional knowledge and skills more available for people. For example, the Emperor ordered to open the so-called numbers schools

(tsifirnye shkoly) in 1714, which offered strictly technical programs. General primary education was of little interest to Peter the Great, but he laid the foundation for its further progression. There were also efforts to act on issues of public education during the reign of Empress Catherine II. For example, a project for public school organization was developed in 1770. The framework was provided by the Prussian experience. However, the project was never put into operation. The Russian Empire embarked on its own journey and chose not to adopt the European practices. As a result, the reign of Emperor Alexander I established parochial schools in 1803. According to the law, the obligation of maintaining schools was imposed on local communities and their funds. This resulted into a passive attitude to the idea of launching parochial schools. By 1828, there were only about 600 such schools in the Russian Empire. The process of creating schools in Russia continued under Emperor Nicholas I. As a consequence, by 1853, villages of state peasants ran 272 schools, and villages of appanage (udelnye) peasants – 204 schools, with a total of more than 146,000 students (Bol'shaya entsiklopediya, 1904: 262).

The Zemstvo and Municipal Reforms in the era of Emperor Alexander II called on society to play a role in local self-governing, including the development of the public education system. With self-governing capabilities, localities and cities created public schools (narodnye uchilishcha) designed in line with a more Europeanized model than parochial schools.

Nevertheless, by the end of the century, despite the efforts, the Russian Empire was still very far from its stated ideal – universal primary education. A confirmation is provided by the census of 1897 that showed that only 13% of the population could write and do basic arithmetic.

The situation was brought about by multiple reasons, such as very poor availability, optional attendance and a paid basis (here it is necessary to make a reservation that parochial schools charged no money for teaching – Auth.). We can refer to statistical data published in Russia at the end of the 19th century, which revealed the insufficient number of primary educational institutions. It is known that children of school age (that is children aged between 7 and 11 years) accounted for 11 % of the total Russian population. But still the ratio of the children who received primary education to the entire population did not exceed 3 % (Oldenburg, 1992: 24), while the USA had 22 %, Switzerland – 19 %, Germany – 18 %, etc. The high percentages are linked with longer school ages in the countries. Hence, at the end of the 19th century, about 8 % of children, namely 9.5 million people, did not attend school. Discouraging statistics was also collected among recruits to the armed forces of the Russian Empire. For example, at the end of the 19th century, the percentage of illiterate recruits from the European Russia reached 69 %, while there were no illiterate recruits in Saxony and Bavaria, 1 % – in Prussia and 4.4 % – in France. This certainly did not mean that these people remained illiterate when they left the army after their service. Recruit training was carried out by army officers starting from the 1860's (Natolochnaya et al., 2018: 226-227).

The key factor behind inadequate literacy among children was unavailability of schooling, due insufficient number of schools and their unbalanced distribution throughout the country. Public education was the responsibility of two authorities: the Ministry of Public Education and the Most Holy Synod. The Ministry of Public Education ran three types of schools: ministerial schools and schools of self-governing zemstvo and city communities.

Speaking of the schools managed by the Most Holy Synod, their number in the zemstvo and 13 non-zemstvo governorates amounted to 4,521 in 1882, 11,693 – in 1884, 21,840 – in 1890 and 36,635 – in 1898. Moreover, as the number of parochial schools grew, they enjoyed increasingly larger amounts allocated from the state treasury. In 1886, the state allocated 120 thousand rubles, in 1895 – 3.279 million rubles, in 1897 – 5 million rubles, and in 1900 – more than 6.5 million rubles (Bol'shaya entsiklopediya, 1904: 262). Having succeeded to the throne, Nikolay II ordered to inspect the condition of the education system in the country, which was fulfilled in 1894 by the Literacy Committee. The inspection showed that at that time primary training schools and literacy schools numbered 60,592 with 2,970,066 students (Cherkasov, 2011: 139).

The growth of ministerial schools, supported by the ministerial budget, was far more modest. In 1866, the Ministry spent 1.418 million rubles on public education, which accounted for 20.8 % of its budget. In 1897, the figure was 3.738 million rubles or 14 % of the budget. Zemstvo schools, in turn, spent 738 thousand rubles or 5 % of their budget in 1868, and 8.3 million or 14.8 % of the budget – in 1895. Public education expenditure of cities accounted for 580 thousand rubles or 3 % of the budget in 1871 and 5.181 million or 8.25 % of the budget in 1894 (Bol'shaya entsiklopediya, 1904: 262).

The activities channeled into public education by zemstvos significantly broadened after the Zemstvo Reform of 1890. Until the 1890's, the development of the school network was an exclusive responsibility of uezd (an administrative subdivision, a district) zemstvos. The funding of provincial zemstvos only used to support teachers' training colleges, museums and other auxiliary institutions. In this environment, the satisfaction of the local demand for schools could not but vary in different uyezds. More prosperous uyezds built many schools, while others had to build few. Since the 1890's, provincial zemstvos committed themselves to the efficient development of the school network. With the funds of provincial zemstvos, the rest of the uyezds started to launch new schools.

Intense debate on the introduction of compulsory primary education in Russia began already in the 1860's. For example, the Moscow, Chernigov, Tsaritsyn, Vladimir, Olonets and a number of other provincial zemstvos advocate compulsory primary education. A massive flow of corresponding requests were sent to St. Petersburg. The Ministry of Public Education started to consider the idea and was inclined to implement it. Projects for public schools of 1861 and 1871 proposed a series of steps to gradually make compulsory education a reality. Importantly, in 1877, the ministry forwarded a request to public schools principals to consider the possibility of introducing compulsory education, and out of 38 directors, 30 answered that they welcomed the idea. Most principals promoted the step-by-step introduction of compulsory education, with the gradual increase in primary schools in governorates. For example, the report by the Minister of Public Education for 1884, submitted to Emperor Alexander III, said that it was impossible to introduce compulsory education at this time. Meanwhile, there was little doubt that even with a sufficient number of schools, universality could only be achieved without the compulsory basis. A work, titled "Literacy among school-age children in the Moscow and Mozhaysk uezds of the Moscow governorate" (Gramotnost, 1894) by Bogolepov, cited numerous facts that even if a region had enough schools, children did not attend them because they were used in agriculture operations, and their parents took a negative attitude towards schooling. The first reason accounted for 19.1 % of non-attendances, and the second one – 12.4 % of the total number of non-attendances (Gramotnost', 1894).

We should understand that the Russian intelligentsia also kept track of foreign practices used to bring universal education. For example, the UK introduced compulsory education in 1870, France – in 1882 and the United States at the turn of 20th century.

The arrival of general schooling in the Russian Empire was largely hampered by the paid basis of education. According to the applicable laws, primary education was not free, rather institutions and persons, which ran schools, were given the right to charge or not charge school fees. We should explain that Russia's public school budget amounted to about 25 million rubles at the end of the 19th century, and school fees had a minor share in it. In the total spending of all departments for public education, the school fees accounted for less than 1.5 million rubles, or 5.6 % of the budget. In other words, it was quite possible to switch to free education already at the end of the 19th century, especially considering the financial insecurity of peasants and insufficient comprehension among them of the essential role of schooling.

A few words should also be said about extracurricular education. Extracurricular education was a significant element as it helped to strengthen and enhance the knowledge that pupils received at school. Key measures for extracurricular education included: free libraries and reading rooms, free books handed out by zemstvos to the population, activities to arrange book trade in uezds, public Sunday readings with "magic lanterns"* and images as well as issuing the people's newspaper by zemstvos.

So, by the end of the 19th century, the system of public education was represented by ministerial and parochial schools. The schools of the first type were headed by the Ministry of Public Education which had the Education Committee to handle pedagogical matters. The Russian Empire was divided into 12 educational districts which did not include the Irkutsk, Turkestan and Amur governorates general. Each district was managed by a curator who supervised the principal and inspectors of public schools. In addition, supreme supervision over schools performance in a governorate was by law given to the governor. Schools that existed on the basis of the Regulations of 1874 were run by governorate and uezd school boards chaired by marshals of nobility. In this regard, the school boards had a special position in the structure of mixed offices: the governorate

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* It refers to cinematography.

office was usually chaired by the governor and uezd offices only – by marshals of nobility, and here both governorate and uezd councils were headed by marshals of nobility. This can explain the then general tendency – to prioritize the role of the nobility in public education. The district school board included: an inspector of public schools, one representative from the Ministry of Public Education, one from the Ministry of Internal Affairs, one from the diocesan administration (Most Holy Synod), 2 members from the uezd zemstvo assembly and 1 member from the city duma (city council) (if the city sponsors schools). The governorate school board included: a principal of public schools, representatives from the same three bodies, 2 members from the governorate zemstvo assembly and 1 member from the city duma.

The general type of schools was determined by the Regulations of the Primary Public Schools dated May 25, 1874. It was a basic law for the system of public education. It is important to say that this law provided procedures and guidance for zemstvo and city communities in the matters of public education. According to the Regulations of 1874, zemstvo and city public schools could be established by individual societies and private individuals at their discretion by means of donations. These fund allocations were reflected in the optional expenses in the zemstvo and city budgets, but once a school was founded, the costs of its operation became obligatory. The right to close a school was owned by the school council, while a temporary closure by the inspector of public schools. The rights, which belonged to the self-governing offices in public school education, were formulated very vaguely in the Regulations of 1874. As an example, the zemstvo, which financed schools, had the right to elect a curator to control the expenditure. Further, the founder of the school had the right to recommend teaching staff, but it was ultimately approved by the administrative department which could also dismiss teachers.

In addition to the schools operating on the Regulations of 1874, there were uezd schools that functioned on the basis of the Charter of 1828. These schools were state-owned. They were opened using donations of private individuals and societies with subsidies from the Ministry of Public Education. Neither private individuals, nor societies could take part in the school management.

A similar administrative regime was also in place in city schools that operated under the Charter of 1872*. With the Charter of 1872, the government tried to bridge the gap between lower and secondary education by extending the schooling period to 6 years; a type of lower school is created, close to the secondary type.

Parochial schools functioned based on the Regulations of 1884. After 1884, a series of new legislative acts were adopted. For example, 1885 saw a special school council established at the Most Holy Synod, 1888 – uezd branches of diocesan school councils, 1891 – the law on literacy schools, 1896 – the Regulations on the administration of parochial schools and literacy schools.

Here is a basic description of the parochial school organization. The system had the Most Holy Synod at its top, which managed the School Council, consisting of persons appointed by the Most Holy Synod. In the dioceses, the school business was led by a bishop with a diocesan school council that included persons appointed by the bishop, so that no secular persons could by law be a member of the school council. Even zemstvo representatives could only be present if invited. In addition, there were uezd branches of diocesan school boards and monitors of parochial schools appointed by the bishop. Church schools were of two types: parochial schools with a 2–3 year course and literacy schools. Originally, the length of the course in parochial schools was specified at 2 years, and this was viewed as an advantage over zemstvo schools with their three-year term of study. However, in 1898, a special meeting at the Most Holy Synod recognized the need to extend the course to 3 years. Literacy schools had a one-year course in place.

5. Conclusion

As a conclusion, it is necessary to point out that the government of the Russian Empire consolidated major efforts to improve public education since the mid-19th century. At the same time, it is important to note that the government was not only committed to educating the population, but prioritizing the role of parochial schools in the process, which paid much more attention to the spiritual and moral component. This is why significant numbers of parochial schools were opened across the country, and the institutions enjoyed funding from the treasury. On the other hand, schools in the system of the Ministry of Public Education, as well as zemstvo

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* According to the Charter, most uezd schools were transformed into city schools.

(zemstvo – an elective council responsible for the local administration of a provincial district in czarist Russia) and city schools financed by these communities, grew at a much less marked rate. In general, by the end of the 19th century, Russia achieved the encouraging progress in public education, and the transition to universal education was only a matter of time.

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