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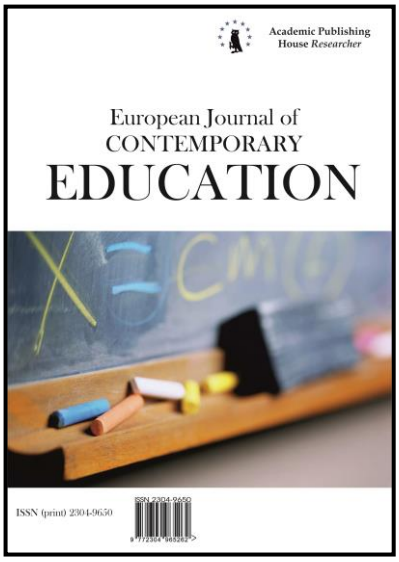

Involvement of Critical Thinking Education in University Studies: A Qualitative Research

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Abstract

The current research addresses interesting and still mostly neglected question of how introductory philosophical disciplines (such as "Introduction to philosophy", "Introduction to ethics" etc.) affects students' comprehension of the concept of critical thinking which is one of the most important descriptive and normative notions in contemporary education. Addressing this issue we formulated following tasks. First, to outline a theoretical framework of the research by introducing models of critical thinking that are relevant in contemporary education. Second, to discover and compare undergraduate students' understanding of critical thinking before and after the completion of their philosophy classes. To complete the first task, the common methods of literature review (scoping, analysis, synthesis) were applied. The second task was completed by means of empirical (qualitative) research. Actual sample of current research consists of 15 undergraduates (first year) students from study program "Physical education and sports" in Lithuanian Sports University (LSU). The method of semi-structured interview was used in the current research. Participants were asked to give elaborated answers to 10 questions prepared in advance, as well as a range of additional questions which appeared to be relevant in the course of the interview. The participants were interviewed twice: the first time before the beginning of their philosophy classes (module "Philosophy of education"), and the second time after their completion. Our research leads to two conclusions. The first (conceptual) conclusion is that despite a great diversity of definitions and theoretical models of critical thinking the underling idea remains the same, namely, that of reflectivity, a general ability to discern different prospects of actions and to associate particular action with initial motives (needs, goals). The second (empirical) conclusion is that philosophical classes, as a kind of educational intervention, makes the idea of reflectivity more articulated in students' conceptions of critical thinking.

Keywords: critical thinking, reflectivity, argumentation, philosophy, physical education, sports.

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1. Introduction

Contemporary educational practice tends towards ideals of "student-centered education" and "meaningful education". These ideals, as well as strategies of their implementation, can be understood in different ways, depending on one's presuppositions. Among many options available, critical thinking education is widely recognized way to make studying in schools and universities meaningful. Researches and practitioners prioritize student's engagement in critical thinking both as an integral element of various specialized disciplines (Huber, Kuncer, 2016) and as separate subject of studies (Byerly, 2019). It is indispensable in the area of humanities which generally deal with qualitative information presented in the form of text (discourse, narrative) (McLaughlin, McGill, 2017). However, even studies of natural and behavioral sciences, that is, sciences, usually dealing with quantitative data, orient towards critical thinking ideal as one of the most important study outcome (Basel et al., 2013). Sport science and physical education (PE) is not an exception here. Future couches and PE teachers need critical thinking skills not only in academic contexts, but in practical problem-solving situations as well (Lodewyk, 2009; Pill, SueSee, 2017). Although these general topics are sufficiently covered in contemporary researches, the significance of particular disciplines, e.g. philosophy, for acquiring critical thinking skills needs more clarification. Especially interesting and still mostly neglected issue is how introductory philosophical disciplines (such as "Introduction to philosophy", "Introduction to ethics" etc.) changes students' comprehension of the very concept of critical thinking. Once one keeps in mind that the Western philosophy is traditionally occupied with "radical questioning" an "problematisation" of common beliefs, one is motivated to expect that in higher education philosophy classes has something to do with engaging in critical thinking and acquiring deeper understanding of what it means to think critically.

This paper aims to investigate how philosophy classes influence undergraduate students' understanding of the concept of critical thinking.

Pursuing the main aim of our research, we formulated following tasks:

First, to outline a theoretical framework of the research by introducing models of critical thinking that are relevant in contemporary education.

Second, to discover and compare undergraduate students' understanding of critical thinking before and after the completion of their philosophy classes.

To complete the first task, the common methods of literature review (scoping, analysis, synthesis) were applied. The second task was completed by means of empirical (qualitative) research. Actual sample of current research consists of 15 undergraduates (first year) students from study program "Physical education and sports" in Lithuanian Sports University (LSU). The method of semi-structured interview was used in the current research. Participants were asked to give elaborated answers to 10 questions prepared in advance, as well as a range of additional questions which appeared to be relevant in the course of the interview. The participants were interviewed twice: the first time before the beginning of their philosophy classes (module "Philosophy of education"), and the second time after their completion.

2. Literature review

"Critical thinking" has become a catchword in today academic language, including technical vocabulary of education science. It is a notion with difficult history and controversial contemporary usage. In what follows we will outline the main aspects of its development and semantics with the view of indicating the relevance of these aspects to the educational practice.

The idea of critical thinking dates back to Ancient Greece. In the teaching of the most Western philosophers – Socrates, Plato, and Aristotle – we find the same leitmotiv: one should enhance one's intellectual capacities, if one intends to attain true knowledge (theoretical aim) and true happiness (practical aim). For, example Socrates encourages his fellow citizens "to take care of their soul" what is intended to mean something opposite to "craving for pleasures" and "craving for glory", the most basic motives of human behavior (Vlastos, 1991). In Greek tradition, philosophy is a "therapy" of human soul, and in the case of Socrates it becomes a form of examination, so-called "elenctics" (Gr. *elenchos*), that is, the enquiry into the most dominant opinions concerning matters of morality. According to Socrates, "unexamined life is not worth living" (Hadot, 1995). This implies that philosophical education of Greek youth must aim at the skills of critical examination or reflection which are the necessary conditions of the meaningful life. The same idea underlies Platonic conception of "pure intellect" (Gr. *dianoia, nous*), as opposed to the faculties of

throughout "imperfect" human body, and Aristotelian notion of so-called "theoretical knowledge" (Gr. *theōretikē epistēmē*).

This Ancient conception finds new proponents among philosophers in 20th century. For example, John Dewey, forefather of philosophy of education (as an independent branch of theoretical enquiry), introduces the concept of reflection and explicates it as capacity to relate logically possible prospects of action and one's current aims (Dewey, 1997). In more precise language, to reflect means being able to gain information from one's environment, to infer multiple solutions of an issue from it, envisage the best possible solution, to implement this solution, to evaluate it in action, and, if one faces adverse consequences, to consider implementing other solution (Ibid.). Thus, critical thinking is a kind of problem solving and decision making the essential characteristic of which is "trials and errors method".

As we see, already Deweyan notion of reflectivity emphasizes contexts of problem solving which is important to later conceptualization of critical thinking. In 1990-ies the task to define the essential cognitive factors of something known under the heading of "critical thinking" was brought into interdisciplinary perspective. This enterprise finally resulted in *The Delphi Report* (Facione, 1990). According to this "statement of expert consensus", "critical thinking" signifies contemporary educational ideal which has two main dimensions: *skill dimension*, that is, wide repertoire of cognitive capacities, mainly associated with making sense of large or smaller bits of information; *disposition dimension*, that is, psychological tendencies to apply these skills in various problem-solving contexts (Ibid.). In short, "critical thinking" is both ability and stance.

There are several important elaborations of the paradigm presented in *The Delphi Report*. One of these – Robert Ennis' "a streamlined conception of critical thinking" (Ennis, 1962; 1989; 1991; 1996; 2013; 2018). According to Ennis' provisional definition, as a technical term "critical thinking" signifies "reasonable reflective thinking that is focused on deciding what to believe or do"" (Ennis, 1991: 8). In a sense, it is restatement of Deweyan ideal of reflectivity. Relative novelty and significance of Ennis' research lies in detailed classification of critical thinking skills and dispositions. In the skills dimension Ennis puts following categories of cognitive capacities (abilities): those involving clarification of an issue (argument analysis; identification of assumptions; etc.); abilities that provide basis for judgment on an issue (observation; deciding credibility of sources); those that involve inference or judgement making (deduction; induction; generalization; explanation); so-called "metacognitive abilities" (ensuring logical coherence, integration of beliefs into larger systems); finally, so-called "auxiliary critical thinking abilities" (monitoring of thinking procedure; identifying emotional aspects of thinking; feedback reception) (Ennis, 1991). Ennis identifies twelve dispositions of critical thinking (e.g., "to try to be well informed", "to look for alternatives" etc.) (Ibid.) which, on a closer look, have the same underlying idea: among the things that make our everyday thinking critical is an objective stance, a tendency to withhold our hasty conclusions and spontaneous judgements. One can question theoretical (philosophical) an empirical basis of Ennis' model, however, it has one evident merit, namely, practical applicability. It enables researches to operationalize the concept of "critical thinking", to identify quantitative factors for psychological testing.

For example, Ennis contributed significantly in composing *Cornell Critical Thinking Test (CCTT)*, one of the most popular instruments, which measures such factors as induction, deduction, observation, assumption, credibility of sources evaluation (Ennis et al., 1985). It seems, this instrument retains its validity in cross-cultural context (French et al., 2014). There is another instrument to evaluate critical thinking capacities – *The Ennis-Weir Critical Thinking Essay Test* (Ennis, Weir, 1985). It is designed to measure factors that are important in discourse comprehension and meaningful discussion: "getting the point"; "seeing the reasons and assumptions"; "stating one's point"; "offering good reasons" etc. According to authors of the test, it emphasizes "the logical dimension of critical thinking", understanding "logical" in a broad sense here (Ibid., p. 2). To put it otherwise, skills of argumentations are at the core of critical thinking.

According to *The Delphi Report* and Ennis' "streamlined conception", "critical thinking" is a much wider concept than "logical thinking". Formal (symbolic) logic courses focus on "logical structure" and "patterns of inference" sorting out valid ones and invalid ones (fallacies). In contrast, concept of critical thinking indicates that one should concern not only about validity of inference, but also about truth of one's premises and wider context of the legitimation of one's conclusions. Thus, the main issue to researches and educators is complexity of critical thinking, involvement of different skills and sets of skills in "deciding what to believe or do". Model of Jane

Halonen (1995) encompasses cognitive (performative), metacognitive (monitoring), and emotional dimensions, as well as attitudes of critical thinker. Here cognitive dimension is elaborated more thoroughly comparing with other aspects. It consists of foundation skills (describing; recognizing; interpreting; identifying; listening), higher level skills (applying; evaluating; generating; challenging), and complex skills (problem-solving; theory building; formal criticism etc.) (Ibid.). Thus, Halonen introduces hierarchical order in critical thinking skills taxonomy. This is what Ennis opposes to. He emphasizes that critical thinking skills are interdependent; "although synthesis and evaluation generally do require analysis, analysis generally requires synthesis and evaluation" (Ennis, 1991: 179). At any rate, Halonen's model does not differ from that of Ennis significantly. In both cases critical thinking keeps close to the process of argumentation, legitimation of one particular belief at expense of alternatives. It seems that these two models have a following implicit presupposition in common: one applies the same cognitive capacities whether one is arguing with himself or with others.

The main issue is that educational practice needs definite guidelines, even at the cost of theoretical precision. Usually the level of "resolution" (number of conceptual items) of a theoretical model is inversely proportional to its intelligibility and practical applicability. Thus, we have a quite natural tendency to simplification in the modeling of critical thinking. For example, the model of critical thinking which was constructed by Richard Paul and Linda Elder (Elder, 2005; Paul, Elder, 2006; 2007; 2008; Elder, Paul, 2013; Paul, Heaslip, 1995; Paul et al., 1997) includes three main sets: elements of reasoning/thought (clarity; accuracy, relevance; logicalness etc.); intellectual standards (purposes; questions; points of view; information); intellectual traits (humility; autonomy; integrity etc.). Being critical means application of particular standards (rational criteria) to particular elements (information, content) aiming to elaborate certain traits (personal characteristics). Thinking critically has an offshoot of becoming a critical thinker (Sullivan, 2012). It implies that critical thinking education makes a substantial contribution to personal growth. One can regard practice of critical thinking as a dimension of character development.

In recent years, we have an important shift from *critical thinking* as a special set of skills view to a broader conception that focuses on *critical thinker* as a special type of personality. This shift is evident in the work of Vincent Ruggiero (2003; 2014; 2015). He emphasizes that "intelligence isn't just something we have. It is, more importantly, something we do" (Ruggiero, 2015: 1). According to popular opinion, critical thinking implies a particular attitude towards *others* (information providers, discussion participators): we intend to examine *externalized* beliefs and sources of these beliefs. However, Ruggiero stresses an *internal* orientation of critical thinking, that is, one's readiness to introspect, to identify one's own beliefs and examine them in the light of personal experience and common knowledge (Ruggiero, 2014). He introduces critical thinking as based on fundamental principles: first, one should discover truth, not invent it; second, among two incompatible statements one is false; third, human mind is biased, fallible; fourth, our beliefs have practical consequences (Ruggiero, 2003). These principles ground Ruggiero's ideal of reflective practical thinking.

In summary, at the conceptual level we have different models which, in general, imply the same idea of reflectivity. Critical thinking is "thinking about one's thinking", and it is something opposite to automatic decision-making or spontaneous generating of ideas ("brainstorming"). "Critical thinking" is a designation not so much of a distinctive feature of "professional thinkers" (philosophers, theoreticians, scientists etc.), as of a capacity (or a set of capacities) which, among other things, constitutes an educated individual, a bearer of Western culture.

3. Materials and methods

In our research qualitative approach was employed. According to John Creswell (2007; 2012; 2016), adoption of this approach enables researches to concentrate on a phenomenon in its immediate context; to observe a phenomenon taking into account its dynamics (continuous change) and complexity; to make smaller groups and lesser-scale phenomena legitimate objects of scientific research and theory construction. All these aspects motivated our methodologic preferences in the current research. There are various different designs of qualitative research (grounded theory, phenomenology, narrative research etc.). However, our research is a basic study the distinctive feature of which is that it does not conform to any of these specific designs (Creswell, 2016). Reflective attitude to theoretical presuppositions of a researcher and

sensitiveness to participant's lived experience of a phenomenon – these are the basic methodological principles of the current qualitative research.

To perform our research, we made purposeful sampling which is recommended for qualitative studies (Frost, 2011; Creswell, 2012). Our target sample consisted of all (n = 31) first year undergraduate students of study program "Physical education and sports" in Lithuanian Sports University (LSU). However, actual sample of our research included 15 of overall 31 students, because of the evident repetition of participants' answers (sample saturation).

In accordance with recommendations (Frost, 2011), semi-structured interview was chosen as a data collection method. Participants were given 10 items questionnaire prepared in advance. It included such open-ended questions as following: *"What features makes one's thinking something you call 'critical thinking'?"*; *"Could you give a detailed example of a situation where critical thinking was especially helpful to you?"*; *"Which popular person is exemplary critical thinker in your opinion? Why?"* etc. The questionnaire was prepared on the basis of the theoretical models of Ennis, Paul and Elder, and Ruggiero discussed above. Depending on their answers, participants were given a range of additional questions, such as following: *"You named your coach as an exemplary critical thinker? What about representatives of other professions or activities?"*; *"You stressed an importance of critical thinking for your studies? What about your other activities?"* etc. Participants were interviewed individually, face-to-face. They were initially provided with information about objectives of the research, as well as guaranties of anonymity and confidentiality of gathered data. A duration of an interview varied from about 34 to 60 min., with an average interview lasting about 42 min. The interviews were recorded and transcribed literatim.

Participants were interviewed twice: the first time before taking their "Philosophy of education" classes in January, and the second time after a completion of this study module in June. Our research was conducted in 2018.

Participants of the research were exposed to educational intervention, that is, lectures and seminars of the module "Philosophy of education" (which was included among general university studies courses until the fall of 2018). During lectures participants learned about the main paradigms of Western educational philosophy (rationalism, empiricism, pragmatism, existentialism). The concept of critical thinking was discussed in the contexts of Plato's rationalism and Dewey's pragmatism. During seminars students were familiarized with and practically applied such methods of active learning as concept mapping and argument diagramming. In their classes students were being encouraged not only to question popular pre-philosophical beliefs and philosophical doctrines, but also to argue for and reflect on their own opinions about education. This practice was explicitly identified by teacher as critical thinking.

4. Results

In what follows, we are presenting analysis of the qualitative data acquired during our research. The main aim of such analysis is making sense of raw data by application of the four-step procedure: first, dividing interview transcriptions into segments of information and labeling these segments with codes; two, discarding overlapping and redundant codes; third, collapsing codes into themes; finally, different themes can make a coherent storyline or can be combined into dimensions which provide explanation of the central phenomenon (Saldaña, 2011; Creswell, 2016).

Answers which participants gave before educational intervention are combined in 14 codes, 6 themes and 2 dimensions.

Our research shows that first year undergraduate students tend to associate the concept of the critical thinking with their earlier school learning experiences and current academic experiences in the university (the first dimension) (see Table 1). According to participants (A2, A3, A4, A7, A9, A11, A12), critical thinking is useful for individual assignments, such as essay writing and presentations. The lack of critical thinking skills is very frequently associated with group discussion contexts (A1, A2, A3, A5, A9, A11, A12, A14, A15). The third of participants (A2, A3, A6, A9, A12) apply critical thinking in evaluation of study materials.

Table 1. Comprehension of critical thinking in the dimension of school experiences and university studies (before educational intervention)

Themes	Codes	Examples of quotations
Academic writing	Detecting contradictions	*"<…> I kept searching [materials] for the essay and finally noticed that all these articles contradict one another"* (A11); *"I completed my work [essay] <…> I got nervous because what I was saying in the introduction [i.e. thesis statement] refuted these things at the end of the [body] text"* (A2); *"He [school teacher] contradicted himself all the time"* (A3).
	Detecting nonsense	*"He [author of an article] said nonsense. He tried to say that external motivation does not matter. Absurd."* (A3); *"When I looked at my article review later, I saw that I couldn't understand myself. Many sentences made no sense whatever"* (A7).
Reception of study materials	Evaluating sources	*"In his lecture the [university] teacher was citing old handbooks. I mean, from the previous age"* (A12); *"Then he [school teacher] asked us to watch a clip of very poor quality from YouTube. <…> It is ridiculous"* (A9).
	Questioning competences	*"The [university] teacher all the time speaks about NBA, their offence, tactics. As if he ever worked here. I doubt it"* (A6); *"Then he [university teacher] said that our group project is nonsense. <…> How could he decide it? He just reads the same lectures for years without inventing something new"* (A3).
	Requiring facts	*"One requires critical thinking when during lecture one is told that so and so is a case without any facts"* (A6); *"To became a specialist <…> means not to learn a handbook by heart, but, namely, to ask why these things are in the handbook"* (A2).
Participation in group discussion	Grasping a point	*"He [another student] was keeping trying to prove me wrong until the end of the seminar without hearing what I wanted to say"* (A1); *"Speaking about lectures, seminars and presentations and so on, one thinks critically if one is able to understand what another person says. Even if the latter speaks unclearly"* (A12).
	Making a point	*"She [school teacher] could speak hours and hours and she used to forget what she wanted to say"* (A5); *"The worst thing is when during a seminar everybody is arguing and nobody of them knows what they want to prove"* (A1).

"Everyday extracurricular activities" is the second dimension which unfolds in participants' answers before educational intervention (see Table 2). Two thirds of participants acknowledge the importance of critical thinking in verbal communication (A1, A2, A3, A5, A6, A8, A9, A12, A15). As for this theme, for most of participants to think critically means being able to identify true and false information in the claims of other people (family members, friends, peers etc.) (A1, A2, A3, A5, A9, A12, A15). Two another important themes are articulated in the second dimension, namely, dealing with mass media information (A2, A6, A7, A10, A11, A15) and making moral decisions in various contexts (A2, A6, A7, A13).

Table 2. Comprehension of critical thinking in the dimension of everyday extracurricular activities (before educational intervention)

Themes	Codes	Examples of quotations
Everyday communication	Discerning lie and truth	*"My mom is a perfect critical thinker [laughs]. She always know when I try to lie about my studies and other things"* (A9)*; "Thinking critically is an ability to tell whether somebody is cheating or speaking truth"* (A15)
	Saying what one knows	*"My coach is a critical thinker. He says only things he knows. When he does not know, he acknowledges it"* (A6); *"Our history teacher taught us to think critically, because she always asked for facts and used to say that people usually distort truth"* (A2).
	Being impartial	*"<…> only very few people think critically, to put it otherwise, are impartial and interested in things different people what to prove"* (A1); *"I think critically when I find out what different people say and belief <…> and then decide what truth is"* (A3)
Making sense of mass media information	Detecting fake news	*"There are many fake news in the internet and Facebook, especially in comments. I always read them critically"* (A11); *"In dorm I always hear rumors that somebody stole something or cheated her boyfriend or something else. One must think critically in these cases"* (A10).
	Reading and watching without believing	*"If you read about something in the internet, in the Reddit, for example, or watch something on TV, you usually think 'Oh, this is interesting!' But you shouldn't believe it"* (A9). *"People read all this junk [in the internet] and, for example, they decide to become vegetarians. Thus they do harm to themselves"* (A7).
Making moral decisions	Choosing the best option	*"Playing football or basketball, you can make different decisions. But you cannot play selfishly. <…> You must choose what is the best for your team"* (A5); *"By 'critical thinker' I mean that we must decide what must be done in a particular situation. Young people usually do what they want to do"* (A7).
	Learning from one's mistakes	*"Everybody makes many mistakes in their lives and feels guilty, but only few learn from them. I think this is a critical thinking"* (A13). *"My rule is that a wrong deed always brings bad consequences. <…> I know it from my own experience and I try not to do bad things to other people"* (A2).

Answers which participants gave after educational intervention are combined in 16 codes, 7 themes and 3 dimensions.

After being exposed to educational intervention, participants articulate very similar dimension – that is, "university studies" – as before intervention (see Table 3). This dimension becomes narrower, to be more precise, after educational intervention participants tend to focus on their experiences in the university leaving their learning in shool experiences behind. In this dimension, participants (B1, B2, B3, B8, B13, B14, B15) tend to associate critical thinking with the theme of the study materials reception (as before intervention). There is the second theme, namely, "participation in group discussion", which remains important for most participants (B1, B4, B7, B8, B10, B13, B14, B15) after educational intervention. Finally, participants' answers (B1, B2, B4, B8, B10) unfold the third theme of making personal sense of one's studies in university (that is,

"meaningful learning"), the theme which is rather new comparing with participants' interview before intervention.

Table 3. Comprehension of critical thinking in the dimension of university studies (after educational intervention)

Themes	Codes	Examples of quotations
Reception of study materials	Discerning what is important	*"Preparing for exams, you just cannot learn and remember everything. One must think critically and chose what is the most important"* (B8); *"Teachers say many things, but not all of them make any sense for me as a future PA teacher. There are many things which, I think, are unimportant"* (B1)
	Asking questions	*"<…> many students don't ask questions to teachers. According to them, to ask a question is something shameful. Critical thinker, I mean a student, asks questions"* (B13); *"They [other students] pretended that they understood everything. There were no questions. <…> But you must ask in order to learn something"* (B3).
Meaningful learning	Testing things in practice	*"I think that you must practice something first and only then read scientific articles, because not everything they say are effective in practice"* (B10); *"I work in a gym and I know that what he [teacher] said is not a case. Nobody works in the way he speaks about"* (B1).
	Enriching oneself with knowledge	*"When one thinks and learns <…>, one enriches oneself with knowledge. He knows what scientist have discovered in their articles"* (B2); *"When I study I learn something new what, maybe, my school teachers do not know"* (B8).
Participation in a group discussion	Learning to argue	*"But in our group students usually shout, but not argue <…>. But I think they learn little by little to argue"*(B14); *"It is easier to talk about various things with others when you know about 'argument', 'premises', what these things mean"* (B7).
	Accepting reasonable opinions of others	*"It is not true that I do not accept an opinion if it is not my opinion. <…> I can accept anyone's opinion if he can speak clearly and prove it"* (B1); *"What is a point in claiming something if you cannot defend it? <…> Everybody will think that you are speaking nonsense"* (B4).

After educational intervention participants tend to be more explicit about how they imagine themselves working as teachers in future and about the most important challenges of being a teacher in general. Thus, their answers unfold the second dimension – "teacher's professional development" (see Table 4). It comprises two themes. Firstly, about a half of participants emphasizes the importance of teacher's reflective stance towards common educational beliefs and practices (B1, B3, B4, B8, B11, B13, B15). Secondly, some respondents (B5, B8, B13, B11) stress the teacher's lifelong learning orientation as a major of his professional success.

Table 4. Comprehension of critical thinking in the dimension of teacher's professional development (after educational intervention)

Themes	Codes	Examples of quotations
Reflecting common educational beliefs and practices	New attitude toward students	*"Teachers, especially PE teachers, treat students as children, but not as personalities. I think it is old-fashioned attitude"* (B15)*; "If a she [a teacher] does not respect you, she can only shout at you or ignore you, but not make you better"* (B3).
	Knowing students' needs and expectations	*"All people have their needs and expect to satisfy their needs. But teachers usually do not know what students need"* (B8); *"In schools <…> teachers' job was to stuff student with lots of information. But students need something else. For example, to find a job, to write a CV"* (B1)
	Teacher is not Wikipedia	*"I know that a teacher is not a walking Wikipedia <…>. But my personality must be attractive if I want to work as a teacher"* (B13); *"Teacher comes and tells something you can find in the internet. But young people come to school or university not to listen about something you can find in Google"* (B4).
Teacher's lifelong learning	Following scientific development	*"The best teachers know not only what they learned in universities, but they are interested in science, read a lot"* (B5); *"Being PE teacher, one must know how to do warming-up, how to run, even what to eat. <…> He [PE teacher] must read scientific papers all the time, to understand [them] and to explain [them] to students"* (B8).
	Discarding what does not work	*"If I were PE teacher, I would say: 'Okay, this is not working. I will do it in a new way. I will make my lesson interesting'"* (B13); *"A teacher thinks critically when she knows that some things go wrong in her lessons and she tries to make her lessons better, to immerse students in her subject"* (B11).

Finally, there is the third dimension – "moral decisions and interactions" – which unfold in participants' answers after educational intervention (see Table 5). After completion of their philosophy classes, more than a half of participants (B2, B3, B5, B7, B9, B10, B12, B13) associated critical thinking with reflective attitude toward their own moral beliefs and decisions. An idea of moral autonomy is another important theme in the third dimension. Some participants (B1, B2, B4, B15) tend to associate critical thinking with being moral subjects which are reflective and unrestrained by social context.

Thus, our research shows that that after educational intervention participants' answers tent to be more diverse (unfolding more qualitative categories) comparing with participants' answers before educational intervention. As one can expect, after their philosophical classes participants tends to be more elaborate on themes (e.g., reflection of commonsensical notions, moral autonomy) which are more or less significant in the field of academic philosophy.

Table 5. Comprehension of critical thinking in the dimension of moral decisions and interactions (after educational intervention)

Themes	Codes	Examples of quotations
Reflecting one's own moral beliefs and decisions	Defining personal values	*"If a person has no values, he definitely is not a critical thinker, he just drifts down the stream"* (B13); *"Many young people have no strong values and imitates their peers, uses alcohol, drops their studies <…>"* (B5).
	Choosing goal	*"You should know what to do with your life. <…> [one should] chose a definite goal and purse it consistently"* (B10); *"Without a goal everything is meaningless. <…> A person which thinks critically has a goal even in the darkest period of his life"* (B3).
	Choosing means	*"Say, I want to be a scientist or a coach. So what? <…> You can want anything, but you must decide what means leads to something you want"* (B9); *"If a person is unsuccessful this means that you [i.e. this person] live[s] in your [his] fantasies. <…> think what can you do here and now"* (B13)
Becoming autonomous	Question moral norms of others	*"To think critically is to philosophize, to think that what all people think to be good or moral, maybe, is not moral, because they just learned it from their parents"* (B2); *"When you watch TV a lot or spend much time in Facebook, you find out that it is a normal thing to slander someone or even to rob or kill. But if you are reasonable, you know it is nonsense"* (B15)
	Using one's own head	*"Nobody can decide what is best for me, what I should do. <…> one should not listen to others but use one's own head"* (B1); *"To think critically <…> is being free, not under control of others, <…> not doing what other people makes you to do"* (B4).

5. Discussion

In what follows, there is a discussion of the most important findings of our research. First of all, we are to outline a general context relevant to the understanding of these results. Next, we will address the most conspicuous dimensions and themes which unfolded before and after educational intervention.

How do notions of critical thinking and critical thinker apply to contemporary educational practice? This is a complex question, and, for the purposes of the paper, it will suffice to make the following points. First, there is strong tendency to make argumentation the paradigm case of critical thinking in action. That is, contemporary literature implies that to be a critical thinker means to be good in argument analysis and argument presentation (e.g. Rainbolt, Dwyer, 2012). Theory of argumentation provides clear criteria for teaching and testing student's critical thinking skills. These skills include ability to formulate and identify thesis statement, premises and sub-premises, ability to ensure and evaluate logical coherence of an argument (Lau, 2011). Beginning with the Greeks and, maybe, with the exception of Dewey, there is an inclination to interpret problem-solving contexts as contexts of public discussion, beliefs exchange. Following Plato, thinking is being interpreted as "soul's silent dialogue with herself", and educators try to make this dialogue to conform to the standards of informal logic (see Hooks, 2010: 43ff.). Second, in contemporary education, there is strong tendency to conceptualize critical thinking in terms of productivity. To be a critical thinker means to produce sound arguments and make correct decisions. Educators avoid to identify critical thinking with skeptical stance (withholding one's judgement or decision on the issue on question) (Lipman, 1995; 2003). Thus, "critical" becomes a synonym for "efficient". Finally, philosophy tends to lose its status of unique discipline where critical thinking is "at its best". Recent handbooks identify critical reasoning with so-called

"scientific method" the essence of which is the ability to discern between objective facts and subjective truths and the ability to infer testable predications from reliable facts (e.g. Carey, 2011). That is, thinking critically means thinking in scientific way, conforming to scientific standards of meaning and truth in daily life situations.

Keeping in mind the first tendency, theme "Participation in a group discussion" quite expectedly unfolds both in the interview before educational intervention (when school learning experiences of the participants are still lively) and after intervention (when university curriculum plays a more important role). In both interviews this theme appears in dimension of personal studying in university experiences. In this theme, critical thinking, mostly, is understood to be a set of skills that student lacks. According to participants, immediate result of this deficiency is that group discussions become tedious and unconstructive (remember the second tendency mentioned above). This accord well with other researches. For example, qualitative research of Basel and colleagues (2013) addressed question how students argue discussing the topic of evolution in biology (that is, in the context of scientific education). In this research it was found that students use different schemes in their argumentation and that causal reasoning, argument from example(s), argument from analogy are the most preferable among them. However, students' arguments, in general, are of very low complexity (single claims without justification) and low complexity (claim justified by a single ground). The same difficulties with argumentation in scientific contexts are reviled by other researches (Berland, McNeill, 2010). In our research after educational intervention in a few cases group discussion theme unfolds in positive light, that is, participants note improvement of students' argumentation skills. However, previous quantitative researches (e.g. Harell, 2011) notices that introduction of argument diagramming (a method used in our educational intervention) increases significantly the scores of low-achieving students in their philosophy classes.

As noticed earlier, our research shows that before educational intervention in the dimension of school and university learning experiences participants tends to associate the notion of critical thinking with a rather reserved attitude to study materials. Questioning teachers' claims, sources and competences is conspicuous leitmotiv here. However, after educational intervention participants associate critical thinking with prospect of their future work as teachers. In this respect, critical thinking has something to do with one's professional development. It accords with other studies. For example, researches (Moeti et al., 2017) found out that PGDE (Post-Graduate Diploma in Education) students associate critical thinking with teachers' career and professional development, even if they feel lacking critical thinking skills themselves and notice the lack of critical thinking education in current programs. In another qualitative study (Marin, de la Pava, 2017) EFL (English as a Foreign Language) teachers acknowledge critical thinking as an important element of teacher's competence although they have some difficulties to explicate the very notion of critical thinking at conceptual level.

Finally, our research indicates interesting unfolding of the association between critical thinking and moral intelligence (or competence) due to educational intervention. Before intervention participants discussed moral decisions in the dimension of everyday activities (engaging in sports, meeting friends, interacting with family members, dealing with informational influence of the mass media etc.). However, after educational intervention moral intelligence constitutes a separate dimension where the main emphasis lays on reflective attitude toward common morality and moral autonomy. It is in line with other studies on the issue. For example, in qualitative research of Davies and Heyward (2019) participants emphasized that teaches education should focus on "student teachers finding their own authentic ethical voice, through the examination of ethical dilemmas via critical thinking and the wider examination of the political, historical and social contexts that led to the dilemma" (p. 1). This is not unexpected outcome for, as researches conclude (Maxwell, Schwimmer, 2016), for the last 30 years, there has been general and unchallenged consensus in literature that ethical element should be persistent throughout teacher education curriculum. According to quantitative researches (Park et al., 2012), longer involvement in thinking about ethical issues is associated with higher principled thinking scores.

Being compared with the findings of other researchers, the results of current research clearly indicates that due to educational intervention concept of critical thinking is being associated with inward orientation, that is, recognition of one's personal responsibility for one's moral decisions and professional success.

6. Conclusion

Current research leads to two main conclusions. The first conclusion (conceptual one) is that despite a great diversity of definitions and theoretical models of critical thinking the underling idea remains the same, namely, that of *reflectivity*, a general ability to discern different prospects of actions and to associate particular action with initial motives (needs, goals). To put it otherwise, it is idea of moral agent who not only enjoys freedom of decisions (at least conceived freedom, if not actual) but also takes consciously risks to turn his decisions into actions and to face their consequences. The second conclusion (empirical one) is that philosophical classes, as a kind of educational intervention, makes the idea of reflectivity more articulated in students' conceptions of critical thinking. Before educational intervention they tend to emphasize external orientation in their conceptions of critical thinking, that is, to treat it as an attitude towards knowledge, beliefs, decisions and norms of others (peers, family members, teachers, media). After intervention students tends to articulate the notion of critical thinking in terms of their own decisions, skills and prospects of professional development. Of course, it is only provisional conclusion which need elaboration in future researches (both qualitative and quantitative).

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