

CRITICAL THINKING: AN EXPERIMENT IN INITIAL TEACHER EDUCATION

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Abstract

It is undeniable that educational institutions play an important role in any society's development. It is expected for schools to contribute to people's development in a whole, as well as to prepare students for the personal, professional, social, and economic challenges that a constant changing world demands. Such form of education involves building knowledge, developing dispositions, values, abilities, and skills, so that individuals can have a holistic understanding of the world, while also knowing when and how to act in all life's challenging situations.

Being aware of how to think and act critically from early on is particularly decisive in initial teacher education curricula, especially in the Curricular Unit "Initiation to Professional Practice 3", which was attended by 3rd year students of Basic Education of a Polytechnic Institute in the North of Portugal, in the 2020/2021 academic year.

This was achieved throughout appropriate strategies and methodologies, which were able to promote: (1) the development of the students' critical skills, who will ultimately become future education professionals; (2) the development of the students' sensitivity to understand the decisive role they have in shaping their potential students' future; and (3) their empowerment as promoters of critical thinking.

It was the first time that students and teachers worked in this Curricular Unit and, therefore, from a methodological point of view, it was openly and experimental endeavour.

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Data were mainly collected from written records made by students and from conversations between them and/or between students and teachers. All of these took place in the classroom, where all tasks were monitored.

By analysing the collected data, it was made clear that the cognitive processes were highlighted during the resolution of the aforementioned tasks. That said, a few higher-level tasks were performed with certain difficulty by the students. They have reacted positively to these tasks, even though they have often focused on the content of the work instead of focusing on the skills as expected. Students have valued the opportunity to get to know different contexts, as well as various educational resources and model practices that could be applied in their future careers. By recognizing the importance of training selective, assertive, and thoughtful professionals, the teaching team believes that the Curricular Internship Units allow students to reflect critically about several aspects that relate, either directly or indirectly, to education, as well as to the sharing of exemplary, inspiring, challenging, innovative, and context-appropriate educational practices, experiments and resources.

Keywords: Critical Thinking, Initial Teacher Education, Educational Practices.

1 INTRODUCTION

Critical Thinking (CP) has been occupying a prominent place in different domains and various contexts.

It is considered to be a capacity or competence associated with a way of thinking that is reliable, reasoned, consistent, coherent, sensible, and intentional [1-3]. It even comes to be regarded as a cognitive strategy that involves a series of mental processes and representations that are applied while

analysing and assessing the appropriateness, value, and veracity of certain situations with the purpose of making questions, choices, decisions, and even formulating new conceptions [4, 5]. This cognitive strategy is also perceived as a superior form of thinking, which goes beyond knowledge and, when sufficiently developed, allows people to solve problems and to act prudently, ethically, flexibly, and with hindsight and openness in everyday situations, whether in the workplace, in the social sphere or under academic learning conditions [5,6].

Besides being a highly valued ability in the workplace, CP can also be a strong ally for any person, since it can help avoid unpleasant situations (or even destructive ones, for that matter), while also helping them lead to actively contribute to society [6].

In several countries, school guidelines have been attributing importance to CP in a more explicit way in the last decades. Portugal is no exception. In 2017, an extremely important new file regarding the curriculum guideline was developed – the Profile of the Student at the end of Compulsory Schooling [7], which gave focus to critical and creative thinking amongst the main skills that are expected to be developed by any student from the beginning until the end of compulsory schooling.

This may be a way to materialise school expectations, in the sense that they should be sufficiently bold and evolved to become truly influential [8] and to meet the needs of both school communities and society in general.

It is common knowledge that the teacher's role is crucial in schools, particularly in regard to the impact they have on students and, consequently, on society. Teachers are the ones who orchestrate the strategies, the methodologies, the learning environments, and the resources used in class. Moreover, and to be able to reach the school community, it is them who, in many cases, may select these, in the light of the conditions, of their ideas, of the knowledge they have built up, of the curricula guidelines and of the needs and objectives listed by the educational institution where they work. The students' learning (not only in terms of knowledge, but also in terms of capacities, skills, standards and values) will partially be the product of this orchestration. Teachers will, therefore, be an orchestrator, a mentor, a vehicle, and a model in this learning process, including in the development of critical thinking skills and competences. It is the teacher's responsibility to stimulate curiosity, involvement, autonomy, self-confidence, initiative, perseverance, flexibility of thought, the concern about looking at different perspectives, non-conformism; it is their responsibility to help students take ownership of the problem situations they want to see discussed [9].

If it is true that it is important that CP is developed from early on, it is no less true that older students, such as higher education students – and particularly those who aspire to become teachers themselves –, should develop this capacity as well, as they should become aware of the advantages of CP at a personal development level, but also as a need to be able to promote this approach among their future students [3,6]. After all, it is at school that a great part of the development of each citizen takes place, not only at the level of knowledge, but also at the level of each person's intellectual and moral autonomy and of each person's ability to know how to behave appropriately so that they participate, make options, and take decisions with hindsight [10].

It is in this sense that training courses are considered favourable contexts for future teachers for them to improve their ability to think critically, but also to understand the importance of developing CP from the early years of schooling and to learn to select, adapt or create tasks and pedagogical strategies that promote CP in the classroom [6].

In the set of theories that support educational practices regarding the definition of educational objectives in different domains – cognitive, affective, and psychomotor –, Benjamim Bloom's taxonomy [10] stands out. These domains are associated with a series of skills and processes which function as references for assessment.

According to this concept, the learner goes through different and gradually complex levels in each domain. Each of these levels corresponds to a certain goal and the higher the level, the broader and more solid the learning will be.

Bloom [11] structures the cognitive domain on which this work is focused into six levels which have been renamed by several authors [12] after a review of his initial proposal: remembering, understanding, applying, analysing, evaluating and creating. The first three levels are regarded as involving cognitive processes of low nature, while the last three ones involve processes of high-level nature. Each of these levels integrates a set of specific actions which are consistent with the corresponding process and degree of complexity. The process of remembering is associated with the ability to rely on memory; understanding involves conferring meaning to an idea or situation; applying refers to the ability to call for knowledge in order to apply it to new situations; analysing involves separating content into parts,

identifying and relating them to better understand the overall situation in its entirety; evaluating is related to the formation of judgement about what is known, sustained by certain criteria; and creation is related to developing something new from what already exists or is known, which may result in something concrete, in an idea, or in a mere situation of planning or a generalization.

2 METHODOLOGY

This study is carried out through qualitative and interpretative methodologies and characteristics of an experimental study, since it aims at obtaining preliminary data which will in the future be deepened on more precise and grounded concerns [13, 14].

This study aims at understanding how students react when they are confronted with a traineeship curricular unit for the first time, where situations require a comparative and reflective analysis of different realities with opposed characteristics, as well as manners of how to comprehend these teaching-learning situations. For the present research project, the following two guiding questions were defined:

- 1 What higher-level cognitive processes stand out in students when they perform tasks that require critical thinking?
- 2 What and how do initial teacher education students think about tasks that require critical thinking?

This study involved 19 students who attended the Curricular Unit of Initiation to Professional Practice of the 3rd year of the Degree in Basic Education in the 2020/2021 academic year.

Briefly, the students were suggested to watch a television reporting in which some characteristics of the Portuguese education system were compared with those of the Finnish education system, one of the best positioned countries in the PISA (Programme for International Student Assessment) and TIMSS (Trends in International Mathematics and Science Study) rankings.

After viewing the reporting, the students were asked to write a text comparing the realities of the two countries in the light of various parameters. They were also asked to write an insightful commentary about the reporting. Students were guided by some questions, which functioned as means of orientation: (I) how do teachers perceive curricula programmes and planning? (II) how is the teaching-learning process organised: into disciplinary, interdisciplinary or both? (III) Which methodologies are prioritised? (IV) What spaces/environments are used for the classes and how are the equipment and the students organised? (V) What type of resources are preferred to make the teaching-learning process easier (manipulatives, digital, outdoor environment, among others)? (VI) How many students are approximately in each class? (VII) Which students' competences and abilities are explicitly valued? (VIII) How is the relationship between the teacher and the students described? (IX) What benefits and/or constraints result from mono-teaching up to Year 7? (X) What importance is given to tests/exams in the teaching and learning process? (XI) What importance is given to homework? How often are they marked and what is the purpose of it? (XII) How do students perceive school and learning? (XIII) What is the position of each country on the international PISA and TIMSS rankings? (XIV) What relevance is given to the rankings in each country?

Even though these questions were regarded as starting points, the students were free to base their answers on different reliable sources too.

To carry out this task, the students were organised into nine groups: one group was constituted by three members and eight others by two. This resulted in written assignments, such as individual reflections, and together with observation and field notes – which included comments and questions asked in class –, they represent the techniques and the instruments of data collection for this study.

For this analysis, the data was organised into categories. The categories referring to cognitive processes are based in research and secondary literature, specifically in the categorisations that stem from Bloom's taxonomy [12]. The categories for the analysis of appreciations were defined *a posteriori* because they have emerged from the results.

The results obtained through the aforementioned techniques and strategies are presented in this next section.

3 RESULTS

The results of this educational experiment carried by 3rd year of the Degree in Basic Education are presented in a descriptive and interpretative way and, for the sake of organisation, associated with each one of the aforementioned questions.

★ Question 1: Which higher level cognitive processes stand out in students when performing tasks that require critical thinking?

They were able to coherently divide the information into several parts and to identify each one of these parts, as well as the differences and the relationships between them. Some groups have categorised the information by topic and have compared the reality of the two countries. One of the groups has analysed each country separately. Even though the evidence of the use of this analytical capacity in each one of the parameters (according to the guidance given) is evident, it seems important to highlight the difficulty in regrouping the parts to characterise the whole, bearing in mind that few were able to present a synthesis or conclusion of the analysis.

With regard to the process of evaluating, it was observed that only half of the groups have given their own personal opinion. The results for these groups have shown that their conclusions were not well argued. Only one group has justified their arguments by basing themselves on knowledge built up throughout the course; that said, this was done briefly. In relation to the other groups who have made their opinion clear, it seems to us that some of them may have been influenced by the reporting, because, in some cases, the way the information was presented, the questions that were asked and the observations that were made seemed to show some judgement. Other groups have made an evaluation with reference to what they best identify with or would like to have experienced during their academic career. The process of creating is practically non-existent in this task. The groups merely took a position in favour of Finland, stating that Portugal should follow their example. However, they did not suggest any new or different alternatives from the ones presented to them, nor did they consider any further possibilities. That said, one could argue that the task has contributed to a construction, a reformulation, or an expansion of knowledge of the role of the teacher and of methodologies, strategies, and resources which help in the teaching and learning process. This issue will be brought to the table later in this paper, as it is related to the results of the next question.

★ Question 2: What and how do initial teacher education students think about tasks that require critical thinking?

The students have clearly shown a great deal of appreciation for these kinds of tasks. This appreciation was frequent in the comments they have made during the lessons. It would have been expected for all of them to do so in the final reflections, where a critical evaluation of all the experiments they had in the Curricular Unit was requested; however, only six of the 19 students did so. Of these six, most of them have highlighted the relevance of the content of the TV reportage, not considering the CP competence, which we focused on in the task, nor the fact that they could have privileged this type of competence in their future students. Most of the six students stressed the importance of having learnt methodologies, strategies, environments, and resources that could be used in the classroom, as well as the usefulness of this learning for their professional future. The excerpt below is an example of the above:

“Viewing the report on these schools made us reflect on the importance that nature has for children. It is important to take them to new contexts, such as the outdoors, so that they have new experiments and learnings.” (ST5)

Perhaps two of the students have tried to highlight the CP by referring that this experiment has significantly contributed for them to develop fundamental skills which will allow them to teach more properly, as it gave them a different perspective on the teaching and on the learning process; however, their report is not entirely clear, nor explicit, because it is not sufficiently developed, as exemplified by the following sentence, which was extracted from ST11's report:

“All the developed tasks were very enjoyable and allowed us to develop several skills and knowledge, which will be fundamental for our future as teachers.” (ST11)

4 CONCLUSIONS

It is important to keep in mind that the educational experiment described in this text was conceived and planned with the double purpose of promoting the development of the students in the last year of the Degree in Basic Education capacity of critical thinking and making them aware of the importance of

building knowledge supported by CP [10] at any level of schooling. In this sense, in this experiment they had the opportunity to become aware of the need for and importance of developing this competence themselves and to consider the experiment as a model that they can reproduce, with the necessary adaptations, in their future work. They also had the opportunity to develop fundamental [5] and sometimes overlooked skills related to analysing a situation from different points of view, contesting options, taking stands, and recognising that any perspective is based on arguments and has its limitations.

With regard to the study, and as it has already been pointed out, this was focused on two aspects: 1) the higher-level cognitive processes of CP evidenced by the participants in solving a task that required an analytical, a reflective and a critical look at a real situation; and 2) the assessment of proposals of this nature for their development, particularly for their future carers.

On most occasions, students have shown ease in the cognitive process of analysing but revealed some difficulty in evaluating in a well-structured manner. It would be expected that in this reasoning they would present arguments that showed some knowledge built throughout their academic pathways, specifically on strategies, methodologies and appropriate resources that allow a more consistent, effective, and lasting learning. The evaluation capacity evidenced is superficial and seemingly based on personal opinions and beliefs and, in certain cases, it is appeared to have been influenced by the material made available.

The overall difficulty in the process of creating is noteworthy. Students did not call for some of the ideas they used in the analysis and evaluation to present alternatives to what does not seem right to them or to make suggestions for improvement and/or enrichment of the situations. They were exceedingly dependent on the guidelines provided to them and showed a lot of difficulty in thinking beyond these guidelines. In fact, they could have consulted various sources to support their ideas, but this did not happen. They showed a lack of initiative and autonomy. If they continue to have the opportunity to carry out challenges of this nature and if the study was extended in time, an evolution could be registered, as the results are very positive when the teacher intentionally orientates his/her teaching towards the CP [2]. While outside the scope of this study, students then performed other tasks that required critical competence: some traces of the process of creation were already evident, mainly related to the concern of giving suggestions for changing or enriching the proposals presented by colleagues or by themselves. The students reacted well to these proposals that challenged them at the CP level, but when they were challenged to make a well-structured assessment, they have mainly focused on the contribution that the content of the report had on the enrichment and on expansion of knowledge of methodologies, strategies, environments, and resources, instead of focusing on the effect that the proposal had in the development of CP or the contribution that this type of didactic experiments gives to develop CP in students of any level of schooling.

The teaching team that planned and implemented this experiment recognises the importance that CP assumes in initial teacher training courses, due to the need for the comprehensive training of any individual, and particularly of teachers whose professional activity requires a correct and frequent use of this competence and who are able to help others develop it.

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