PROMOTING THE DEVELOPMENT OF TEACHERS' AND STUDENTS' METACOGNITIVE AND THEORY OF MIND (ToM) SKILLS

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Abstract

A research network with academics from five European countries (Cyprus, Greece, Hungary, Portugal and Romania) developed an Erasmus+ successful educational program funded by IDEP (the Foundation for the Management of European Programs for Lifelong Learning), in order to conduct research and a well-designed educational Intervention on Metacognition. The research project aims to enhance teachers' and students' metacognitive, epistemic and Theory-of-Mind (ToM) skills. Such key thinking skills are part of students' higher cognitive & metacognitive skills, which aim to help them 'learn how to learn' for life, but also to correctly interpret human behaviour in order for people to co-exist functionally and harmoniously. This presentation focuses on the specific intervention program in which a Participatory Action Research takes place and a 12- sessions' training program is carried out in 5 participant countries and pre- and post- tests are delivered to all participating teachers and their students. Examples of the tools as well as the content of the 12 training sessions are presented in this paper and dissemination activities are discussed.

Keywords: Metacognition, theory-of-mind, epistemic beliefs, educational intervention.

1. The Erasmus project aims and objectives

The basic aim of this research program is to raise educators and students' awareness of the value of metacognitive skills and further develop and promote students' metacognitive abilities at both primary and secondary educational level, through a corresponding training of teachers.

Thus, the main intended achievement of the PRO-ME-ToM project is to provide a well-elaborated and tested developmental program for improving teachers' and students' metacognitive abilities, a crucial skill for a meaningful participation in the information society (Papaleontiou-Louca, 2008).

More specifically, the project aims to enhance teachers' self-awareness, self-monitoring and self-evaluation, as well as to promote students' metacognitive skills, epistemic beliefs as well as Theory-of-Mind (ToM) skills.

2. Design of the tools

Initially we have reviewed the international literature in order to find an appropriate instrument for assessing metacognitive awareness for teachers and students. In case that we find an appropriate instrument that satisfies the need of the project we will translate the instruments and adopt them. Alternatively, we will develop instruments for assessing metacognitive awareness, which will be validated. The instruments will be pilot-tested in the participating countries, using individual interviews, and revised if it's necessary. A coding scheme has also been developed for coding the instruments and all tests have been translated to the participant countries' languages.

3. The structure and duration of the intervention

Based on successful evidence-based practices reported in the literature, we have designed a training program aiming to support the development of teachers' metacognitive awareness and support them in promoting students' metacognitive skills during their everyday educational practice. We have also designed activities and collected material to be used in the training sessions, which are planned to take place over 12, 90 minutes-sessions. The training will involve presentation and discussion of effective

practices, from cutting-edge research in the field, discussion of case studies promoting metacognitive awareness in different domains and sharing of effective practices among teachers who will participate.

As happened with the evaluation tools, the content and material of the training programme has been also translated into the languages of the participating countries.

The training programme which is now running, takes place in 12 sessions on a weekly, mainly, basis. Four training programmes are running in total of five countries (Cyprus & Greece are combined) and . the training sessions take place virtually, to encourage participation of teachers from different regions, especially from regions with limited opportunities for teachers to engage in programmes for professional development.

Before and after each programme participants' metacognitive awareness and skills have been assessed in order to determine the effectiveness of the programme on promoting teachers' and students' metacognitive awareness and skills.

4. The content of the intervention

4.1. The rationale of the intervention

Teachers first have been informed about the evidence from previous interventions in students' in order to better understand the logic of the present intervention program. Many interventions have been applied in school settings aimed at fostering metacognitive knowledge, strategies, and skills in various knowledge domains, but the literature does not seem to refer to an Intervention of this complexity, involving both teachers and students (of both elementary and secondary educational levels) and promoting simultaneously metacognitive, epistemic and ToM skills.

4.2. Specific objectives of the intervention

The main aims and objectives of the specific Intervention

- To develop teachers' knowledge and skills in order to improve students' metacognitive thinking in the elementary and secondary education

- To develop and implement an Action research seminar for teachers' participatory development so that be able to develop their students' metacognitive skills.

- To support teachers and students to transfer their self-regulating metacognitive knowledge and skills to new tasks.

- To support teachers and students to develop metacognitive skills and strategies for reading comprehension and writing in the mother tongue and mathematics.

- To explore the actual results of teachers and students' metacognitive development through pre-test, post –test and follow up research design.

- To broadly disseminate the participatory processes, activities and results in the national context of the partners and internationally so that to multiply the target group in other schools and countries, through a specifically developed web- page, conferences and publications.

- To communicate broadly the project's objectives, processes and results through an interactive online platform aiming at both providing continuous support of students and teachers' participating in the project and advising teachers who want to implement in their other schools or countries the project.

The concrete objectives and results from this project are to:

a) Assess teachers' and students' metacognitive awareness prior- and after- a teachers' training program.

b) Develop a 3- months' training program for educators of both levels

c) Conduct a follow up evaluation on teachers' and students' Metacognitive & ToM skills

d) Develop a Teachers' Educational Booklet (with helpful activities)

4.3. Action research: the concept and methodology

Action Research is defined as a participatory inductive procedure of teachers' professional development and its cycles of Development (Planning, Teaching, Evaluation-Reflection, Re-planning, Re-Action) are described. Helpful instruments, such as Reflecting Diaries, Observation, Evaluation-Reflection, Feedback, Re-action are discussed and an inductive analysis of the Diaries based on the Grounded Theory (Glaser & Strauss, 1967) is promoted. Moreover, an analysis of the teachers' diaries' is developed, including comparative analysis from lesson to lesson, coding, categories of change, etc. and finally, theory is enhanced by the teachers' role as a mentor/critical friend (Koutselini, 2020).

4.4. The concept and importance of metacognition

After a brief introduction to the concept of Metacognition, we analyze and discus its importance in educational settings. We emphasize one's ability to reflect upon, understand, and control one's own learning. We explain the aspects of Metacognition and we refer to the term as 'cognition about cognition', and as a second-order, meta-representational process. We make distinction among the three facets of Metacognition, i.e., metacognitive knowledge, metacognitive experiences, and metacognitive control and we further analyze these terms by referring to the 3 types of Metacognitive Knowledge (i.e. a) Declarative knowledge, b. Procedural knowledge and c) Conditional knowledge), the types of Metacognitive experiences (including feelings and judgments about a cognitive task (Efklides, 2008; Efklides et al., 2018)] and we discuss about metacognitive control as a way of regulating cognition) including metacognitive strategies such as planning, monitoring, control and evaluation of the learning process.

4.5. The instruction of metacognition

In this section the emphasis is on practical ways in teaching metacognitive skills in classroom. We therefore aim in raising teachers' awareness about various metacognitive strategies and how these can be taught in ways that students' metacognitive skills can be enhanced. Such ways can be either (i) indirectly through experience, (ii) directly through instruction and / or (iii) elicited through practice (e.g., collaborative learning projects often require each student to contribute one part of the overall project).

Two basic modes of teaching metacognition referred in literature include:

(a) Explicitly teach students what is metacognition, how important is to "drive" their minds. So, teachers can use this metaphor from Flemming (2014), by asking their students to describe the benefits and supply examples of driving their brains well (sometimes we might need to put on the brakes e.g., by reviewing a reading passage to make sure that we understand it or to keep our brains moving in the correct lane and along best route toward achieving our goals).

(b) Being a model of "thinking" for the students in various tasks (e.g., thinking aloud the solution process of a problem, or of writing a summary, or making mistakes purposefully, or evaluating your work at the end and so on...). In such a way the process of working in intellectual tasks is "demystified".

Also, teachers discuss how they can encourage their students to:
(i) build a knowledge base with all three kinds of metacognitive knowledge:
Declarative knowledge (I know that I have a repertoire of strategies)
Procedural Knowledge (I know how to apply a strategy) and
Conditional knowledge of the available strategies (I know why and when I should apply each strategy).
and
(ii) give students tasks to practice and apply the new strategies and receive informative feedback (about the learning gains)

One of the basic topics of discussion within the aforementioned programme refers to ways in which metacognitive strategies are implemented in everyday practices. Therefore, in this Intervention Programme emphasis is given in raising teachers' awareness about the importance of metacognitive control processes, namely:

(i) Planning (making predictions before reading, selection of appropriate strategies, allocation of time and resources).
(ii) Monitoring (on-line awareness about the processing of the task and the distance from the learning goal, periodic self-testing while learning)
(iii) Evaluation (appraising the efficiency of one's learning, re-evaluating one's goals-closely related to planning and monitoring).

Since such metacognitive skills take time to be learned and effectively used in various school subjects, it seems necessary that a relevant training ideally should start at quite young ages and be continued in secondary education to fully flourish.

(Metallidou & Moraitou, 2021).

4.6. Epistemic beliefs

The second main content are of this Intervention focuses on 'Epistemic beliefs', that is on beliefs about knowing and knowledge. We discuss how a student's epistemic beliefs are related with his/her academic performance and many cognitive tasks (e.g. multiple-text comprehension and engagement in critical thinking).

Emphasis is especially given on how do epistemic beliefs develop. It seems that the developmental task that underlies the achievement of mature epistemic understanding is the coordination of the subjective and objective dimensions of knowing (Hofer & Pintrich, 1997; Kuhn et al., 2000; Iordanou, 2016). Initially, the objective dimension dominates, to the exclusion of subjectivity. Discussion also refers on how does a person's epistemic beliefs influence their motivation to engage in critical thinking and therefore in their learning and decision-making process.

According to Kuhn et al., 2000 "Someone at the absolutist (as well as the preabsolutist realist) level sees knowledge as an objective entity, as located in the external world and knowable with certainty. In what we take to be a key event in the development of epistemological thought, the multiplist relocates the source of knowledge from the known object to the knowing subject, hence becoming aware of the uncertain, subjective nature of knowing. This awareness comes to assume such proportions, however, that it overpowers and obliterates any objective standard that could serve as a basis for comparison or evaluation of conflicting claims. Because claims are subjective opinions freely chosen by their holders and everyone has a right to their opinion, all opinions are equally right. The evaluativist reintegrates the objective dimension of knowing, by acknowledging uncertainty without forsaking evaluation. Thus, two people can both have legitimate positions Ð can both ``be right'' Ð but one position can have more merit (``be more right'') than the other to the extent that position is better supported by argument and evidence." (Kuhn et al., 2000; p. 2-3)

4.7. Theory-of-mind skills

The third basic component of the Intervention's content refers to the development and promotion of ToM skills including questions such as:

1. What is theory of mind? Why is theory of mind important?

Teachers will be introduced to: (a) the meaning / definition of ToM and (b) its importance for social interaction and communication. Its importance will also be illustrated with references to the impact of deficits in ToM across different areas of functioning.

2. How does theory of mind develop from early years to middle childhood?

Teachers will be familiarized with tasks and research findings indicating that: (a) ToM emerges early in life and (b) advanced ToM skills emerge in middle childhood.

3. Experiential bases of ToM - Can theory of mind be taught and/or improved?

The importance of social environment for children's ToM will be briefly discussed. Findings of intervention programs indicating that ToM skills can be promoted will be presented. The focus will be on interventions aiming to promote ToM in middle childhood.

4. Examples of activities and a story/scenario that can be used to teach 10- to 11-year-old children aim to advance their ToM skills.

(Misailidi et al, 2013).

5. Activities for teachers

In combination to the theoretical part, we also develop practical activities, asking teachers get their students involved in hypothetical scenarios (in language and science topics), and ask them to think and discuss what they can do to help the actor. More importantly, perhaps, we ask teachers to give authentic class examples as well as to propose at least one teaching strategy aiming in promoting metacognitive skills and share their ideas with their colleagues.

6. Planned dissemination activities

The analysis and discussion of the results together to the basic conclusions and relevant suggestions are expected to lead to (at least one theoretical and one empirical scholar papers submitted in) international peer-reviewed journals (such as "Metacognition & Learning") and the findings of the study will be presented at international conferences such as EARLI and AERA. Finally, a Toolkit / Guide booklet for teachers will be prepared as a helping guide for developing students' metacognitive skills (in all partners' languages).

In a rapid changing world, this project seems to consist a necessity, in order to create thinking and reflective people and promote students' thinking skills so that they become active learners through life.

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