



CENTER FOR RESEARCH AND POLICY MAKING

**TEACHING 'LEARNING TO LEARN'
COMPETENCE FOR THE
KNOWLEDGE –BASED SOCIETY**

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Author: Ana Mickovska-Raleva

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EXECUTIVE SUMMARY

The global labor market is changing quickly, forcing education systems to be more adaptable than in previous generations. The ability of individuals to adapt to constantly changing skills demands is being emphasized as one of the key competencies for the future world of work. Because educational leaders cannot predict the exact system of knowledge and skills that future careers will need, education systems are shifting towards developing more general competences and attitudes towards learning. In this regard, a highly developed 'Learning to Learn' [hereinafter: LtL] competence is considered as one of the crucial traits for success of the future workforce because independent learners can constantly independently update their knowledge and skills.

Although rather complex, 'Learning to Learn' competence can be easily organized into three components (skills, values and attitudes), which can be developed within students through different instructional methods. Hence, this study aimed to explore the potential methods through which 'Learning to Learn' competence can be developed throughout formal schooling. The study specifically explored the frequency and quality of use of specific instructional methods. In order to do this, a mixed-methods approach was used consisting of the following methods: one survey among teachers, five in-depth interviews with teachers for the aim of developing conceptual maps of the concept, and five focus-groups with students.

The study found that a majority of teachers use particular instructional methods which support LtL competence. However, only one in four teachers was found to apply such methods consistently and systematically. This implies that teachers are not trained to use LtL supporting methods, but they are also not required to use them, which leaves the decision on the type of instructional practices used on the teacher and his/her personal motivation for continuous professional development. Moreover, the style of a teacher and her/his instructional methods were not found to be related to the environment s/he works in (urban or rural school) or the type of students s/he works with. Findings may be useful for curriculum adjustments for upgrading teacher instructional practices with methods supporting the development of 'Learning to Learn' competence.

INTRODUCTION

The Republic of Macedonia, since its constitution as an independent state 25 years ago, faces very high unemployment rates, ranging from 25-30% (State Statistical Office, 2005-2016). Despite the fragile economy, inefficient education-labor market linkages are frequently noted as one of the reasons for the high unemployment. Several recent reports on Macedonia indicate the mismatch between the education system and the labor market (World Bank, 2010; Ministry of Labour and Social Policy (MLSP), 2010). In addition, numerous analyses (Center for Research and Policy Making - CRPM, 2009; MLSP, 2012) indicate that Macedonian youth lack sufficient employability skills such as problem-solving, self-management, and initiative. This is of concern to policy makers given the high youth unemployment rate of almost 50% (SSO, 2016). These occurrences still pose a difficulty to predict the future development of labor market demands in Macedonia and the region and adequately focus on developing specific skills for the workforce of tomorrow.

A World Bank (2010) survey among employers in Macedonia noted that the restructuring of enterprises is one source for the mismatch between available jobs and job seekers' skills. The Bank noted that *"newly created jobs differ in terms of the skill content from the old jobs that are being destroyed"* (p. 5). An additional problem that employers face is the lack of appropriate skills for the newly opened or transformed positions. The skills in demand are mainly 'soft' skills such as problem solving skills. They rely on job attitudes and behavioral skills of workers. Specifically, the report notes that

"modern firms seek workers who have higher level cognitive and behavioral skills, such as problem solving, initiative, and ability to organize ones' work. These differences imply that in order to meet the demands of the modern sector of the Macedonian economy, the educational system would need to put more emphasis on the provision of skills which are particularly important to modern firms" (p.9).

In order to develop the higher-order competencies required by employers, a World Bank report (2012) emphasizes that school practices need to transform for students to become able to *"organize and regulate their own learning, learn both independently and in groups, and overcome difficulties in the learning process"* (p.50). To facilitate this, they need to develop metacognitive skills, methods and strategies for effective learning - as well as motivation for continuous learning - as preconditions for *'successful learning in future life'* (p.50).

As studies¹ indicate that businesses need more adaptive workers who are prepared to learn and continuously develop throughout their career, the education system will then need to respond fast by enabling students to gain motivation and skills for lifelong learning. LtL competence represents the basis for a lifelong learning orientation and hence needs to be addressed more seriously throughout the formal schooling. Teachers bear the main burden for the development of new competencies among students, especially competencies related to learning, and are therefore the entry point for addressing the issue of deficient LtL competence and lifelong learning orientation. Hence, teachers are the ones to be targeted if any policy interventions for developing LtL competence within students are to be successful.

¹ See World Bank.Macedonia. Demand for Skills Survey (2009); The Futures of Learning: What Kind of Learning for the 21st Century? Scott, C. L. (2015)

The necessity for intervention in the teaching and learning process should be a priority for Macedonia, bearing in mind that the formal education system in the country is still predominantly focused on transmitting knowledge in the traditional sense such as teacher-centered learning, focus on memorizing etc. (Mickovska-Raleva, Tomovska-Misoska, Hristova-Zaevska, Kostik-Ivanovik and Cherepnalkovska, 2017), instead of competences as required from contemporary education systems. Such traditional learning approaches may lead towards development of future workers, ready-made for one specific profession and inflexible of adjusting to novel professional requirements and unexpected career shifts. Bearing in mind that LtL competence stretches beyond cognitive functioning, involving an affective function of willingness (and readiness to tackle a learning situation/problem) is frequently linked to ‘adaptability’, stimulating its development throughout the schooling system. Such skills and functions are especially important for equipping the future workforce with skills to quickly adapt to the changing labor market.

JUSTIFICATION

The knowledge-based society relies on individuals with strong achievement motivation and adaptability to novel tasks found in the constantly changing labor market. LtL competence incorporates these features as part of its concept. While there have been certain efforts within the Macedonian education system to form these competences within students, the system is still largely focused on the learning in the traditional sense, i.e. acquisition of knowledge and skills. One study of the quality assurance system (Mickovska-Raleva, 2013) pinpoints that while more traditional competences, such as ‘communication in the mother tongue’, ‘mathematics and sciences’, ‘foreign language communication’ and ‘computer literacy’ are being addressed on a medium level by the education system, ‘learning to learn’ competence is almost absent from the quality assurance system and its assessment mechanisms. Although some of the cognitive aspects of the competence (i.e. problem solving) are included within the curriculum and incorporated as learning outcomes, the affective and motivational aspects are largely neglected². The education system must take notice of the importance of these factors in the development of the education policy, as authors claim that “*non-cognitive skills are at least as important as cognitive skills for individual development and labor market success*” (Brunello and Schlotter, 2011).

The current analysis builds onto the conclusions of the only study of LtL competence in Macedonia (Janevski et al., 2008), where the following recommendations are provided: (1) there is a need to increase the skills of teachers and change their attitudes to further develop their competencies in order to acquire an understanding of the learning to learn concept; (2) there is a need ‘to intensify the teachers’ training on the concepts of critical thinking and creative teaching...and similar concepts which would enable developing competencies useful for introducing changes into the teaching process’; (3) there is dissatisfaction among students with the teaching methods; and (4) even teachers who are trained to use contemporary student-centered methods do not sustain their practice.

Hence, the study begins by recognizing that a shift in the structure of the education system is required in order to keep pace with labor market demands. However, noting

² See primary education curricula at: <http://bro.gov.mk/?q=osnovno-obrazovanie>

that the complete education system is difficult to be reformed thoroughly, this study focuses on one of the most important factors for students' educational achievement – teachers. Through exploring teachers' beliefs and implicit theories of the LtL concept and the manners in which they are being implemented through their instructional practices, this study seeks to inform larger debates about teaching and learning in Macedonia.

At the same time, the study aims to tackle the issue of inequalities in educational achievement by students from different socio-economic backgrounds (Aleksova and Mitreski, 2007) through analyzing potential differences in developing LtL competence within teachers working in schools with in different composition of students, and assessing whether they succeed in counterbalancing the role of family background in educational achievement. Therefore, this study intends to identify key instructional issues related to LtL for the purposes of labor market preparation of all students, and improved educational achievement for children in schools who face numerous challenges.

THEORETICAL FRAMEWORK

*“As paradoxical as it may sound, it is the student who has to have method. The teacher, however, needs to know the method of leading the student to method”
(Hugo Gaudig, 1917, p.90)*

Although we think of the concept of Learning to Learn as rather new, its importance and basic characteristics have been recognized for at least 100 years, as the quote above indicates. LtL competence has been mentioned by academics as a specific construct since the 1970s and 1980s, but has only relatively recently been recognized as one of the eight key competences³ for the 21st century by the European Commission (Directorate General for Education and Culture, 2000). The aim was to shift from the concepts of knowledge and skills as typical outputs of the schooling process, to the concept of competences, which reflect a combination of knowledge, skills, attitudes and values. These competences are considered to be better predictors of the future success in the labor market than technical skills alone. In this regard, the EC considers the key competences as “*quintessential necessary throughout the life for continuing to gain employment and be included within the everyday life activities including those of civil society and decision making*” (Hoskins and Fredriksson, 2008, p.11).

Among all the competences examined by the EC, LtL is considered as one of the most important, but also most complex. LtL is defined as ‘*the ability to pursue and persist in learning, to organise one’s own learning (...) awareness of one’s learning process and needs, identifying available opportunities, and the ability to overcome obstacles in order to learn successfully*’. (Education Council, 2006 annex, paragraph 5) The commission adds that:

‘Learning to learn skills require firstly the acquisition of the fundamental basic skills such as literacy, numeracy and ICT skills that are necessary for further learning. Building on these skills, an individual should be able to access, gain, process and assimilate new knowledge and skills. This requires effective management of one’s learning, career and work patterns, and, in particular, the ability to persevere with learning, to concentrate for extended periods and to reflect critically on the purposes and aims of learning.’ (Education Council, 2006 annex, paragraph 6).

According to the Centre for Research on Lifelong Learning (CRELL) (2008), the new LtL framework consists of the following dimensions:

1. Affective dimension (learning motivation, learning strategies and orientation towards change, academic self-concept and self-esteem and learning environment);
2. Cognitive dimension (identifying a proposition, using rules, testing rules and propositions, using mental tools); and
3. Meta-cognition (problem solving (metacognitive) monitoring tasks, metacognitive accuracy, metacognitive confidence). (Goia, 2010)

³ Note that the EC uses the word “competences” (the plural of competence) while many researchers use “competencies” (the plural of “competency”). Throughout the text, the two terms will be used synonymously.

It is obvious that LtL competence is multi-faceted and hence challenging to be fully developed only within the formal education system. However, Stringher (2014, p.16) notes that the competence is “transferable, and thus teachable” and if the aim is to develop it further, the concept needs to be included in the area of pedagogy, instead of only psychology and sociology (p.19). Therefore, recognizing that LtL competence is teachable, we focus on the aspect of classroom instruction and try to assess instructional practices’ influence on developing this competence.

In this regard, contemporary education systems are moving towards a so-called competence-oriented education, which, as the European Commission puts it ‘represents a paradigm shift’, since ‘it impacts not only the structure of curricula, but also changes the organization of learning’ in the direction of more cross-curricular approaches, emphasis on interactive teaching and learning, combining formal, informal and non-formal learning, new roles from the teacher / educator as a guide throughout the learning process, and new approaches to assessment. (European Commission, 2018, p.5)

Most research on LtL has been carried out in Finland, especially in the frames of the ‘Life as Learning – LEARN’ program 2002-2006, where instruments for assessing LtL competence among students have been developed and adjusted from existing instruments. The program also resulted with development of a framework on the competence. In addition, the University of Bristol (UK) developed the ‘Effective Lifelong Learning Inventory’ which provides an overview of a learning profile of a person based on the seven factors included in the test. Furthermore, in Netherlands, a test on cross-curricular competences has been developed for students in secondary schools (Hoskins and Fredriksson, 2008).

The Expert Group set up by the European Network of Policy Makers for the Evaluation of Education Systems revised the previously mentioned instruments to develop an assessment which has been pre-piloted in eight European countries in 2008 in order to analyze the cross-cultural differences in the dimensions (Hoskins and Fredriksson, 2008).

Finally, international student assessments: Trends in International Mathematics and Science Study (TIMSS) and Progress in International Reading Literacy Study (PIRLS), implemented by IAE and Programme for International Student Assessment (PISA), implemented by OECD contain certain questions aimed to measure cross-curricular competences. For example, for PISA these are: ‘identifying a proposition’, ‘using rules’, ‘testing rules/propositions’; which correspond to the concepts of critical thinking and problem solving as aspects of the cognitive dimension; as well as ‘using mental tools’, which correspond to the meta-cognitive dimension of LtL competence. Moreover, the 2018 PISA framework includes the aspect of ‘flexibility’, which is closely linked to the LtL framework, since it refers to the ‘ability to adapt one’s thinking, behaviors and actions according to the prevailing cultural environment, or to novel situations and contexts that might present new demands or challenges.’ (OECD, 2016, p.13)

LTL- FROM CONCEPT TO PRACTICE

Contextualizing the LtL construct is necessary for understanding its importance in the school setting. Stringer (2014) considers it both as output of the teaching process and as input, by saying

”two factors are key at the classroom level: didactic objectives (what to teach, the actual curriculum) and didactic means (how to teach, i.e. disciplinary and cross-disciplinary methodologies; Melchiori, 2001). LtL pertains to both of these categories, i.e. it is an aim as well as methodology to achieve those aims: it is not only a product of schooling but also a key process in enhancing student learning, hence its crucial importance for individuals and groups”(Stringher, 2014, p.229).

She adds that while LtL can be considered an internal disposition of each learner, it can be further supported and developed by “learner-centered teachers and learning experiences to master, sustain, and actualize them over a lifetime” (Stringher, 2014, p244). Considering these characteristics, the competence is assessed as malleable, and the school setting is detected as an important agent for maintaining the natural LtL dispositions and nurturing them throughout the schooling process.

Operationalizing the concept, Hewlett Foundation’s (2013) document on Deeper Learning Competencies outlines the following student skills and behaviors as indicators for LtL competence:

1. Students set a goal for each learning task, monitor their progress towards the goal, and adapt their approach as needed to successfully complete a task or solve a problem.
2. Students know and can apply a variety of study skills and strategies to meet the demands of a task.
3. Students monitor their comprehension as they learn, recognize when they become confused or encounter obstacles, diagnose barriers to their success, and select appropriate strategies to work through them.
4. Students work well independently but ask for help when they need it.
5. Students routinely reflect on their learning experiences and apply insights to subsequent situations.
6. Students are aware of their strengths and weaknesses, and anticipate needing to work harder in some areas.
7. Students enjoy and seek out learning on their own and with others.
8. Students delay gratification, refocus after distractions, and maintain momentum until they reach their goal.
9. Students use failures and setbacks as opportunities for feedback and apply lessons learned to improve future efforts.
10. Students continue looking for new ways to learn challenging material or solve difficult problems.

Hewlett Foundation (2013, p.4-5)

In this regard, Hipkins and Cowie (2014) emphasize that appropriate instructional methods are necessary for ‘enacting LtL’. Enactments include: learner choice and independence (e.g. via inquiry learning), and “structured goal-setting and opportunities for the learner to evaluate their own progress towards those” goals. (p.295) However, applying these (and related) methods needs to be systematic and consistent throughout the teacher’s practice. This sometimes requires in-service teachers to ‘unlearn’ what they already know and build a new system of thinking about the knowledge and related pedagogical interventions from the bottom up. The goal is easier to be achieved with pre-service teachers, which, according to Dembo (2001), need to learn how to learn (through educational psychology course) in order to be able to transfer such skills to students. Indeed, Dembo stated that *“If future teachers acquire self-regulatory skills in their own learning, they may be better able and willing to model and teach these skills in their own classrooms”* (2001, p. 27)

However, in order for LtL competence to be effectively stimulated in the school setting, a whole-school approach is advised. Goldspink and Foster (2014) elaborated upon a school intervention in Australia with the intention of making cultural transformation and pedagogical change which included: greater choice in what to learn, greater choice in how to learn, learning that was less class-centered, teachers who were more professionally engaged. School transformation lead to: higher achievement scores, higher meta-cognitive skills, less boredom etc.

LTL IN THE MACEDONIAN CONTEXT

Policy documents in Macedonia do not specifically mention the term ‘learning to learn’, although certain aspects of the concept are included in some national policies. In particular, the Law on Primary Education (Official Gazette of RM, 2016) incorporates, as part of the goals, the following: “gaining general and applicable knowledge which enable individual creative action in the social and natural environment and developing abilities for judgment and expression in culture and cultural traditions”, “developing abilities for research, (and) experimenting and solving problems”. The competences noted mainly refer to the cognitive dimension of the LtL construct, while the other two dimensions are not incorporated as goals of the primary education.⁴

The Conception for Nine-grade Primary Education (Ministry of Education and Science, 2007) incorporates aspects of the LtL concept in two of its guiding principles. Specifically, the principle of “overall development of the student’s personality” envisions that all aspects of the personality (cognitive, emotional, social and psychomotor) need to be stimulated throughout the primary school. The principle places emphasis on the nurturing of the social and emotional development of the student, which can be partially related to the affective dimension of the LtL competence. In addition, the principle of “preparing students for lifelong learning” outlines the teaching and learning process needs to be “enriched with contents, new methods and techniques which encourage critical thinking within students”. The Ministry of Education also cites the need to develop curiosity and the need for continuous individual learning and upgrading of knowledge, through motivating and enabling

⁴ The Law on Secondary Education does not include elaboration of goals of the law, and hence does not mention any of the aspects of the LtL competence.

students to use efficient methods and techniques for self-guided learning. This is considered to turn students into lifelong learners. This principle incorporates the basic elements of the LtL competence and their ultimate goal – lifelong learning.

Moreover, the Basic Professional Teacher Competences document (MCEC, 2016), as well as certain teacher education programs, include the aspect of self-guided learning (synonymous with LtL), as part of the teacher competences and/or learning outcomes of the teacher education. For example, under Professional Abilities and Skills, the mentioned document notes that the teacher should ‘assist students to become aware of their personal learning process and prepares students for self-guided learning and research’.

Nevertheless, the Strategy for Development of Education (2018-2025) and the related action plan only superficially includes the LtL’s composing elements, which is especially concerning considering the importance of this document in outlining the future education priorities.

It can be concluded that while the concept has been partially recognized by Macedonian policy makers, it has not been sufficiently integrated within the educational policy agenda, and has not been translated in teaching practice and in student outcomes, as several recent studies suggest.

As noted above, LtL concepts are also found in international assessments. The PISA assessment incorporates certain aspects of LtL construct within its framework. In particular, the cognitive dimension of the construct is certainly linked to the concept of epistemic knowledge, which, defined by OECD, refers to the ‘knowledge of the constructs and defining features essential to the process of knowledge building in science and *their role in justifying* the knowledge produced by science *e.g.*, a hypothesis, a theory or an observation *and* its role in contributing to how we know what we know’ (OECD, 2013). However, data from the 2015 PISA assessment indicate this type of knowledge is under-developed within Macedonian students, with less than one fifth of them achieving it (Mickovska-Raleva et al., 2017). Data from the same study indicate that one in five (20%) of Macedonian students has achieved the competencies for ‘Evaluation and design of scientific enquiry’ and ‘Scientific interpretation of data and evidence’, which are also linked to the cognitive dimension of LtL framework. This number is significantly smaller compared to the OECD average of 35% of students achieving these competences. (Ibid, 2017).

Regarding the affective dimension of the LtL construct, findings from Mickovska-Raleva et al.’s 2017 study indicated that student self-efficacy and intrinsic motivation (assessed as enjoyment in learning Science) were significantly positively related to the PISA scores of Macedonian students. However, the analysis of the teaching practices in primary schools indicated that traditional methods of lecturing are still dominant, with the teacher being the main transmitter of knowledge. In such approaches, students are passive recipients. Such practices were not found by students as intrinsically stimulating for learning. In addition, findings showed that instrumental motivation is the dominant type of motivation among students and the main motive for learning (i.e., receiving good grades and satisfying the parents) (Ibid, 2017).

In regards to higher-level thinking skills, the latest findings from a Step by Step (2017) study on reading and mathematics literacy in early-grades found that students fare relatively well on assignments requiring them to fluently reading a text, but have problems comprehending the texts. Specifically, when they need to respond to questions related to certain facts from the text, students achieve better, but when it comes to connecting information from different parts of the text and provide their personal opinion, they face problems. This study demonstrated that students may have mechanical decoding skills

which support reading fluency, but lack the capacity to generate their own knowledge from text. It also indicates that aspects of the LtL competence are being neglected from the beginning of the schooling process.

The latest intervention for tackling the issue of developing lifelong learning skills within Macedonian students was implemented by the World Bank during 2016 (Boudet, 2018) and focused on the development of grit (fostering motivation among students promoting consistency of effort and interest). An experimental design was used to assess the differences between (1) students who had no intervention, (2) students directed towards self-regulated learning and (3) students trained by teachers.

The intervention was found to increase the socio-emotional skills of the two treatment groups, and the second treatment had higher impacts for Roma students. While the intervention has been assessed as successful in general, the authors suggest continuing research on the topic.

Findings from the previously elaborated studies have informed the current study and provoked even greater interest to understand what is happening within Macedonian classrooms. This study sought to understand how teachers' implicit theories of LtL influence their pedagogies and contribute towards stimulating development of the competence.

METHODOLOGY

Bearing in mind the very limited data available on the research issue, the research design has been largely built on the collection of primary data. It was primarily based on collection of qualitative data, initially from survey of teachers, with majority of qualitative questions, which were then categorized and quantified; followed by in-depth interviews of selected survey respondents; and FGD (focus-group discussions) with students. Hence, the design can be categorized as explanatory sequential mixed-method (Creswell, 2009). The primary aim was collecting variety of data from different sources, in order to deepen the understanding of the issue, contextualize quantitative data and enable comparisons of different perspectives. Using a variety of methods for triangulation of data also enabled validation of the research instruments..

GOAL AND OBJECTIVES

The study aimed to address the relationship between teacher instructional strategies and development of LtL competence among students. It further sought to understand how LtL can be successfully stimulated within the classroom. Moreover, the research aimed to shed light on the implicit understanding that teachers have of LtL, as a means to developing effective methods for (re)forming their implicit theories.

The chosen approach is based on focusing on the teacher-related input instead of the output, as most previous studies did. Specifically, the research design moves away from assessing the actual competence of LtL among students and towards assessing some of the factors influencing its development. The main innovative aspect of the proposed methodology is assessing the instructional techniques used by teachers, as particularly important aspect which should provide a clear ground for policy appraisal and proposing policy changes. Moreover, the use of cognitive maps as a mean of understanding teacher's implicit understanding of the concept is an additional innovative aspect for validation and contextualizing the data.

Therefore, the general goal of the analysis is: To assess the level of implementation of instructional techniques for developing LtL competence, with a focus on the higher-level thinking skills, use of metacognitive strategies and intrinsic motivation.

Specific goals:

- To assess the frequency of use of instructional methods linked to the development of LtL competence in different learning situations.
- To compare the frequency of use of instructional methods related to the development of LtL competence by teachers in schools with different socio-economic composition of students.
- To gather qualitative information on the perceived effectiveness of different instructional methods within students.
- To gather qualitative information on the teachers' implicit theories of the LtL concept.

RESEARCH PROCESS

Twenty schools from across the country were contacted to participate in the research. One half of the schools responded to the request. Ten primary schools (grades 1-9) across Macedonia, stratified according to the composition of students and their location, agreed to participate. The initial stage of distributing teacher questionnaires began in February 2017. While some schools preferred the questionnaires to be distributed to them by post and then mailed back, other preferred the survey to take place in one day. All schools received 15 questionnaires, to be completed by 10-15 teachers from subject teaching (with the exemption of Music, Arts and Physical Education teachers). The selection of teachers was reliant on volunteers, and in certain schools it included all grade-level teachers in the school, while in other schools only a portion of the teachers participated. A total of 114 completed questionnaires were received at the end of this research phase. Their demographic characteristics are presented in Table 1.

Table 1. Demographic characteristics of respondents on the Teacher Questionnaire

	School in urban area	School in rural area		
Location	66.7%	33.3%		
Gender	female	male		
	83.3%	13.2%		
Age	22-34	35-49	50+	Missing data
	19.3%	50.9%	27.2%	2.6%
Level of education	High (two-year)	Higher (four years)	Master	Missing data
	10.5%	78.9%	7.9%	2.7%
Subject teaching	Mathematics/natural Sciences	Social Sciences	Language	Missing data
	31.6%	9.6%	36%	22.8%

In each school 10-15 subject-teachers of grades 5-9 took part in the teachers' survey by completing the Teacher Questionnaire. Teachers were asked to report in the questionnaire whether they would like to be interviewed later on in the research process. Only 14 teachers from eight schools agreed to be interviewed and five were selected for the interviews. Interviewees with different levels of use of LtL supporting instruction; from different schools (with regards to location, structure of students in the school); and subject/s they teach were selected for the study. The five teachers interviewed had the following characteristics: two worked in a rural school in Eastern Macedonia, one in a Roma-majority school in Western Macedonia and two in a central school in the capital of Skopje. Two

of the teachers were found to frequently use LtL supporting instructional methods, while three used such methods less frequently.

In addition, one focus group discussion (FGD) with ninth-grade students was conducted in five schools, with the following characteristics: one rural school (an ethnically mixed Macedonian and Albanian school) in Western Macedonia, one rural school in Eastern Macedonia, one urban school in Skopje, one urban school (with a majority of ethnic Roma students) in Western Macedonia and one urban school in Central Macedonia (with a majority of ethnic Macedonian students). The process of conducting interviews and focus groups took place during March and April 2017. The student participants were selected from the school support staff (psychologist, pedagogue) taking into account pre-determined demographic criteria provided by researchers, such as gender, ethnic background and school achievement. In the rural schools, all ninth-grade students participated, as their number in the school was rather small (less than ten). A total of 48 students participated at the focus group discussions. 25 of them were female, while 23 male. The vast majority (40) belonged to the Macedonian ethnic group, while eight to the Roma ethnic group. FGDs were organized within the school setting and were moderated by the lead researcher. They lasted for about one hour. No school representatives were present during the discussions in order to enable students to freely express themselves.

DEVELOPMENT OF RESEARCH INSTRUMENTS

The **main research instrument – Teachers’ Questionnaire** consists of 14 vignettes - hypothetical classroom situations (see Appendix 1), requesting teachers to elaborate their response/reaction to each of the vignettes. Items one and two refer to teacher’s implicit theory of intelligence (entity vs. incremental)⁵; items three to five aim to assess teacher practices related to developing the cognitive dimension of the LtL construct; items six and seven refer to strategies potentially supporting metacognitive development, items eight to ten touch upon the aspects of creative and critical thinking, as part of the cognitive dimension; and items 11-14 aim to assess the instructional practices related to the affective component of the LtL construct. Questions 3-14 have been designed as open-ended in order to avoid leading the teachers towards certain socially (i.e. educationally) desirable responses. Using vignettes was considered to be the most effective method, considering the resources available, to enable teachers to contextualize their responses, without being limited by terminology and professional language. Instead, they have been able to describe their practices in simple, behavioral terms. Using vignettes describing hypothetical classroom situations was expected to stimulate teachers’ intuitive responses and reflect their implicit understanding of the LtL concept and its composing parts. In addition to the vignettes, the second part of the questionnaire consists of demographic questions, such as: gender, age, educational degree attained, subject areas they teach, years of experience as a teacher, and outline of the trainings attended and their perceived level of use. Finally, the research instrument enquired about the level of satisfaction with different aspects of cooperation within the school, as well as the overall satisfaction with their profession as a teacher.

⁵ Based on Dweck and Leggett’s framework (1988)

In order to harmonize the questions/vignettes developed by the main researcher with the realities of Macedonian classrooms, three teachers from different schools and study areas (mathematics/natural sciences, languages and social science) were selected to serve as research assistants in fine-tuning the questionnaires. On the basis of teachers' personal understanding of the questions and their experience in the school context, minor adjustments to the questionnaires were made.

The teacher questionnaire was piloted in three schools (20 teachers in total). Although the open-ended nature of the questions was initially perceived as potentially risky, the piloting showed that teachers understood the questions and provided appropriate and detailed responses. However, a need arose to clarify one of the questions and leave out an additional question, as the responses did not provide significant additional information. In addition, the information on the trainings/workshops attended was slightly restructured in order to provide better clarity.

Research assistants indicated that their colleagues did not mind the open-ended questions, but required time to think about the responses. This information slightly changed the fieldwork plan to conduct the data collection during one-day visits to the schools. Instead, schools were contacted and asked whether they would prefer to have the questionnaires sent to them in order to be completed or to have the researcher collect the data by visiting the school.

The **In-depth Interview Teacher Questionnaire** is a semi-structured interview protocol consisted of eight prompting questions, related to the main dimensions of the LtL construct: metacognition, cognition and motivation/persistence. Teachers were asked to define concepts such as: problem solving ability, creative thinking ability, lifelong learning, persistence in learning, awareness of the learning process; to elaborate on their perceived importance in school, the potential methods for developing and assessing their achievement, etc. (Appendix 1)

The **Student Focus Group Discussion Questionnaire** consisted of nine prompting questions referring to the frequency of use of different instructional methods in school, the process of learning in school and at home, the motivation for learning and the factors supporting or suppressing it. (Appendix 1)

QUESTIONNAIRE SCORING

In order to enable conducting a quantitative analysis, the qualitative responses on each item from the Teachers' Questionnaire have been coded, based on their content, according to previously defined assessment rubrics (see Appendix 2). The assessment rubrics were developed by the main researcher on the basis of literature, but adjusted according to the array of responses received with the questionnaire. Hence, they are context-dependent. Qualitative responses were coded into three rubrics according to their content: (1) not supporting LtL, (2) partially supporting LtL and (3) fully supporting LtL.⁶ The coding was performed independently by the three teachers-researchers, who were guided in this process by the assessment rubrics. After receiving the assessments of all three independent researchers/evaluators, the lead researcher performed some

⁶ Responses which were assessed as irrelevant for the question were coded as 0, and imputed as missing values in the database.

minor adjustments in the coding, in order to harmonize the inter-rater reliability. Specifically, in situations where codes for the same item response differed for more than one point (e.g. the response was coded as 1 by one evaluator and 3 by another), adjustments were made by the lead researcher on the basis of review of the actual response.

Furthermore, from the three values per item, appointed by evaluators, mean value was calculated (ranging from 1 to 3). The range of values was divided in three equal parts and values from 1-1.6 were categorized under (1) not supporting LtL, values from 1.7-2.3 under (2) partially supporting LtL and 2.4-3 under (3) fully supporting LtL (See Table 2). Hence, each item has a value calculated as a mean of the three values appointed by each evaluator.

Apart from calculating mean values for each item, mean values for each sub-dimension of the LtL construct (Cognitive dimension, Metacognitive dimension and Affective dimension) were calculated as composite variables of the items designed for measuring the instructional methods for supporting each respective sub-dimension. In this regard, each item was considered as having the same weight.

Finally, a composite variable of all items for assessing instructional methods (Q4-Q14) was constructed, named 'LtL methods-composite'.

Table 2. Distribution of items, LtL sub dimensions and LtL instruction according to the value assigned to them

Values	Coding
1-1.6	(1) not supporting LtL
1.7-2.3	(2) partially supporting LtL
2.4-3	(3) fully supporting LtL

DATA ANALYSIS

Data from teacher questionnaires were processed by combining (1) qualitative content-analysis with (2) descriptive statistical analysis with regards to the frequency of use of different instructional methods, and (3) correlational statistical analysis of scores on individual questions and sub-scales (dependent variables) with variables related to opinions and demographic data (independent variables). Hence, data are presented both quantitatively (percentage of teachers using specific methods according to their level of support of LtL, and arithmetic mean of the values for each of the three dimensions and the overall construct, where 1=lowest value and 3=highest value) and qualitatively in the form of quotes of responses.

The independent variables included the demographic characteristics of respondents, such as: age, gender, years of teaching experience, level of education, type and number of attended trainings; as well as the subjective perceptions of satisfaction with the cooperation with different school-based actors. The independent variables included the responses on each item related to the instructional methods used, as

well as the composite variables related to the LtL sub-dimensions and the overall LtL supporting instruction.

Data from the interviews with teachers have been analyzed qualitatively and presented in the form of graphic conceptual-maps for each of the five interviewed teachers.

Data from the focus group discussions with students have been analyzed qualitatively through a thematic analysis of responses according to topics. Due to the relatively small number of respondents, the analysis did not include coding of data, but only classification under specific topics.

FINDINGS

FREQUENCY AND QUALITY OF USE OF METHODS SUPPORTING DEVELOPMENT OF LTL COMPETENCE

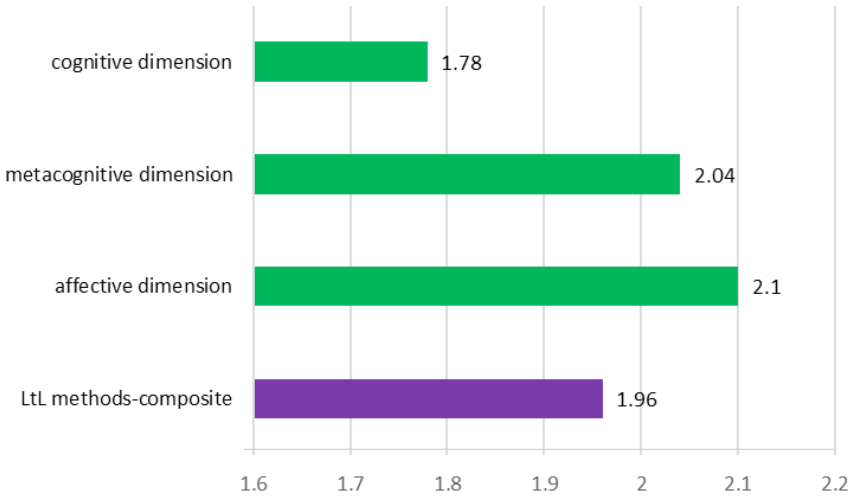
In line with the general concept of LtL, teachers responded to questions referring to different aspects of the construct: (1) cognitive dimension (including problem-solving, creative and critical thinking); (2) metacognitive dimension; and (3) affective dimension (including motivation and emotions). The questions aimed to detect how teachers react to everyday classroom situations, which can be potentially utilized to stimulate different dimensions of the LtL construct. Teachers were not acquainted with the specific aim of the study, in order to prevent providing responses which would be socially desirable in the context of the topic. Instead, they were provided a general frame of the questionnaire and stimulated to provide diverse responses which could be used for sharing best practices. In this way, they were motivated, to a certain extent, to put more thought and elaborate their responses more thoroughly.

Table 3. Operationalization of composite variables

		Variable name	Variable operationalization	Teacher Questionnaire items encompassed
Composite variables	C1	LtL methods	measure of the overall level of use of instructional methods which support the development of LtL competence (min.=1, max=3)	Q3-Q14
	C2	cognitive dimension	measure of the overall level of use of instructional methods which support the development of the cognitive dimension of LtL competence (min.=1, max=3)	Q3, Q4, Q5, Q8, Q9, Q10
	C3	metacognitive dimension	measure of the overall level of use of instructional methods which support the development of the metacognitive dimension of LtL competence (min.=1, max=3)	Q6, Q7
	C4	affective dimension	measure of the overall level of use of instructional methods which support the development of the affective dimension of LtL competence (min.=1, max=3)	Q11, Q12, Q13, Q14

Data presented in Figure 1 show that the mean value for the three dimensions (see operationalization in Table 3), as well as the overall composite variable ‘Ltl methods’ is around 2, indicating that employing methods partially supporting development of Ltl is the most common case among teachers. Data from Figure 2 additionally support this claim through providing evidence that more than half surveyed teachers to a certain degree use methods which are found to stimulate aspects of Ltl competence. Only one in five teachers consistently employs methods supporting development of the cognitive dimension of Ltl, and one in four consistently employs such methods for developing the metacognitive and affective dimension.

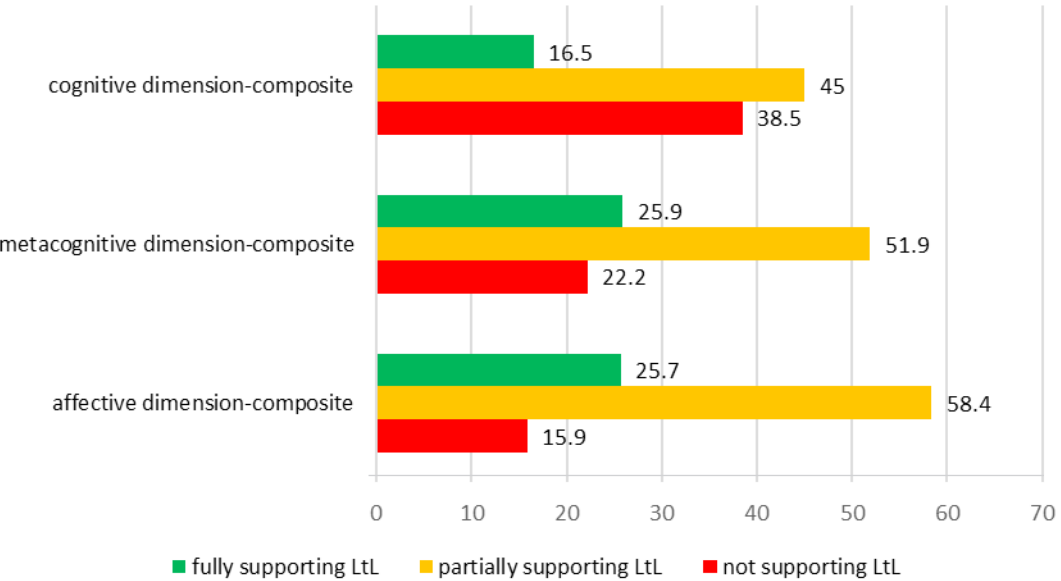
Figure 1. Quality of use of Ltl supporting methods for the three dimensions and the overall construct (mean value)



It can be concluded that there is a clear trend when it comes to using methods stimulating Ltl, with the majority of teachers reporting to use certain instructional methods expected to stimulate the development of Ltl, but inconsistently. With regards to different dimensions of the construct, teachers are most likely to consistently use methods supporting the affective dimension and least likely to use methods supporting the cognitive dimension. Responses of teachers to specific situations potentially stimulating Ltl are elaborated in the following sub-chapter.

consistently use methods supporting the affective dimension and least likely to use methods supporting the cognitive dimension. Responses of teachers to specific situations potentially stimulating Ltl are elaborated in the following sub-chapter.

Figure 2. Percentage of teachers using methods supporting Ltl in regards to different dimensions of the construct

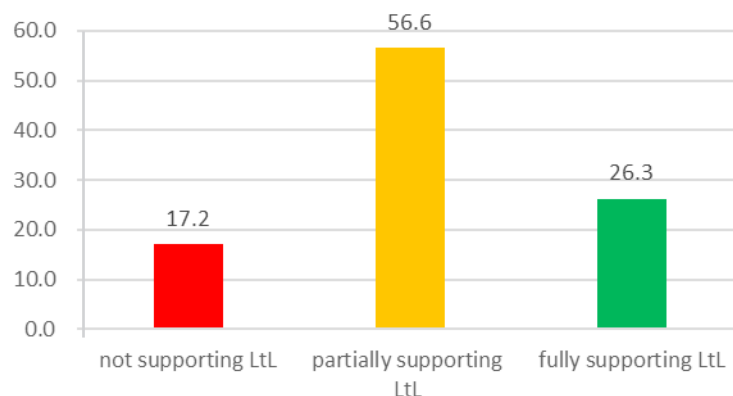


FREQUENCY AND QUALITY OF USE OF METHODS SUPPORTING DEVELOPMENT OF THE COGNITIVE DIMENSION OF LTL COMPETENCE

Meta-analyses have shown that using student-centered methods in the classroom are significantly positively correlated with higher cognitive student outcomes, in particular increased creative and critical thinking (Cornelius-White, 2007). The author relates this with the explicit idea of the learner-centered model “to encourage higher order thinking and respect for divergent opinions” (Cornelius-White, 2007, p.131). In addition, Stringher notes that “LTL dispositions are part of each learner’s natural learning capacities and natural curiosity but require learner-centered teachers and learning experiences to master, sustain, and actualize them over a lifetime” (2014, p.244). Therefore, for the aim of assessing instructional methods related to developing cognitive competencies comprising the LTL construct, three questions (hypothetical situations) were developed, requiring from respondents to elaborate their actions in situations of (1) presenting a new curricular unit (Q3 from Teacher Questionnaire), (2) assisting students in understanding terminology (Q4), and (3) addressing student misconceptions about a topic (Q5).

In the first learning situation, the criteria for assessing whether an instructional method reflects LTL was for the teacher to describe using Lerner-Centered active teaching methods (coded as ‘fully supporting LTL’). In addition, responses were coded as not supporting LTL if they elaborated (1) traditional teacher-centered instructional methods; and as partially supporting LTL if the lessons elaborated (2) traditional methods, with partial and limited use of learner-centered methods. Data indicate that only one quarter of teachers elaborated lessons most likely to support LTL competence (role-playing, simulations, debates, discussions, problem-based learning, etc.; examples in Box 1), while almost half elaborated lessons which combined traditional and active teaching methods, and are thus assessed to only partially contribute to the development of LTL. (See Figure 3)

Figure 3. Percentage of teachers supporting LTL competence (cognitive dimension), based on the use of student-centered teaching and learning strategies (Q3)



Box 1. Examples of instructional methods with different levels of support towards developing the cognitive dimension of LtL competence

(1) Using traditional teacher-centered instructional methods

Teaching unit: Adding fractions

Introductory part: Recalling the definition of fraction, types of fractions (frontal method)

Main part: Individual work on adding fractions

Concluding part: Summarizing what has been learned. Giving homework

(2) Using traditional methods, with partial and limited use of learner-centered methods

Teaching unit: Grammatical categories in adjectives

Introductory part: Reviewing the topic about adjectives

Main part: I write a sentence on the blackboard and the students should find the adjectives. They should conclude how they are changing

Concluding part: Students do the same by responding to examples in the textbook

(3) Using Lerner-Centered active teaching methods

Teaching unit: Food Pyramid

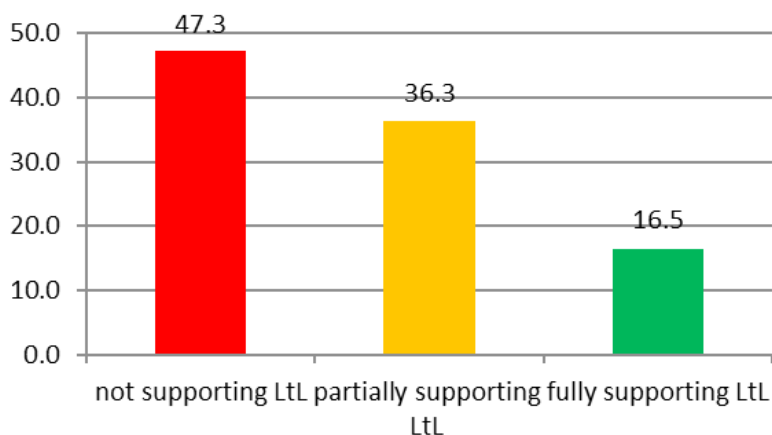
Introductory part: I show students two types of food (apple and chocolate) and initiate a discussion about which one is healthier and why. Methods (demonstrative, discussion)

Main part: Discussion about the Food Pyramid. Making a food pyramid by sticking pictures of food. (Methods: discussion, practical work. Form: work in groups)

Concluding part: Presenting the food pyramids made by students (Assessment methods: verbal presentations)

The subsequent situation (Q4) required from teachers to elaborate a method for explaining a certain terminology to students, and the categories (from lowest to highest degree of supporting LtL) included (1) does not explain, or explains through familiar/simpler terms; (2) explains through connecting to real life; and (3) explains and requires application of the term/concept, allows the students to explore the topic on their own. The third category is mostly related to the methods of experiential learning, which is found to stimulate problem-solving skills (Arjomand et al., 2013). However, data indicate that the majority of teachers do not use this situation as a potential for developing LtL, with nearly half of them (47.3%) only addressing the problem at the lowest level by providing a 'dictionary' definition or a synonymus term, while only 16.5% using it as an opportunity to initiate practical learning, or learning through individual exploration (Figure 4). Examples of the three levels of instructional methods are provided in Box 2.

Figure 4. Percentage of teachers supporting LtL competence (cognitive dimension), based on the use of experiential learning methods (Q4)



Box2. Examples of instructional methods with different levels of support towards developing the cognitive dimension of LtL competence

(1) Does not explain, or explains through familiar/simpler terms

I use a dictionary to explain the term.

(2) Explains through connecting to real life

I explain the term through simpler words/sentences and provide everyday examples.

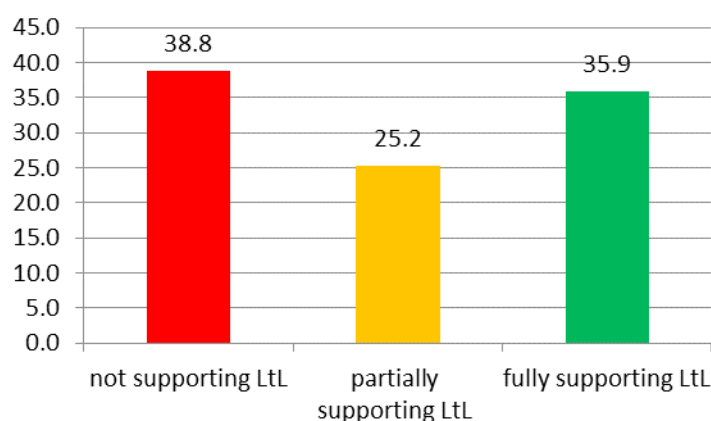
(3) Explains and requires application of the term/concept, allows the students to explore the topic on their own

I explain the term and request from them to make conceptual maps related to it to see how they connect it to other terms they know.

The third question (Q5) for assessing the level of support of the cognitive dimension required teachers to elaborate their reaction to a situation in which students believe they know a certain content from their everyday life, but actually have misconceptions about it. Teachers were asked to explain how they would approach the issue in order to point out the misconceptions and regain the students' interest. Categories of responses ranged from (1) providing everyday examples/practices; through (2) opening a discussion/debate about the topic; to (3) creating a cognitive conflict; requiring practical application; or requiring students to explore/research the topic. Similarly, as in the previous question, the third category of responses is expected to fully support the cognitive dimension of the LtL competence, through stimulating students' higher-order thinking. Studies (e.g. Madu and Orji, 2015) show that using the method of cognitive conflict is more likely to lead towards conceptual change ('to experience conceptual shift') within students, compared to traditional teaching approaches. Data from categorized questions from the Teacher Questionnaire indicate that one-third of teachers would use some of the practices most likely to support LtL; but still, more than one third (38.8%) would not use such methods, but would react by simply providing everyday examples to students (see Figure 5). Some

of the methods with a different level of potential to stimulate the development of LtL are provided in Box 3.

Figure 5. Percentage of teachers supporting LtL competence (cognitive dimension), based on the use of methods activating higher-levels of thinking/practical application (Q5)



Box 3. Examples of instructional methods with different levels of support towards developing the cognitive dimension of LtL competence(Q5)

(1) Providing everyday examples/practices

I provide them example related to the topic, so they can understand their misconceptions.

(2) Opening a discussion/debate about the topic

Through a discussion on the topic, we will try to clarify the incorrect conceptions.

(3) Creating a cognitive conflict; or requiring practical application; or requiring students to explore/research the topic

I'll face them with a problem situation for them to solve, but won't be able to do this (will discover this on their own) and they'll feel the need for more engagement.

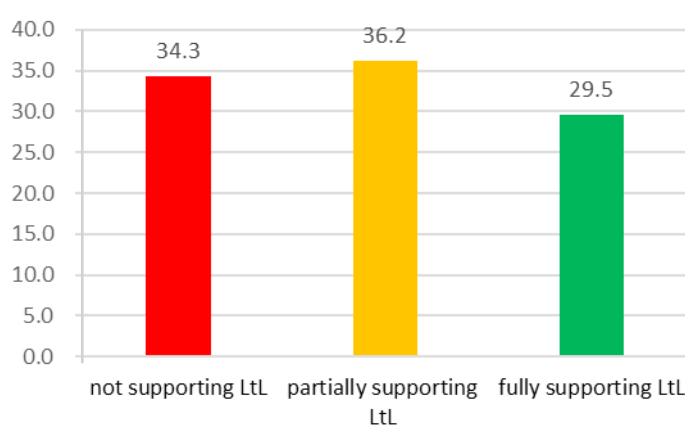
I give them a specific situation, a problem and once they approach and try to solve the problem as they believe is appropriate, I present them with information which indicates that their way of thinking was incorrect. They realize themselves which aspects are new.

The aspect of creative/critical thinking was considered as part of the cognitive dimension of LtL construct. It was assessed through two questions referring to students that react critically and untypically with regards to the contents they are learning. Unlike the previous questions that aimed at directly stimulating these aspects of the competence, the following two items referred to methods used for (not) suppressing the already established creative and critical thinking among students. In the first situation (Q8), the hypothetical student criticizes the teacher about a poorly communicated written assignment. The responses are classified as the teacher (1) not accepting student's feedback and maintaining that the assignment is well communicated; (2) explaining/reformulating the question; and (3) asking the student what s/he finds unclear and/or attempting to engage

him/her to reformulate it. Authors, such as Christenbury and Kelly (1985) note that one of the strategies for stimulating critical thinking within students is to allow them ‘to function as experts’, meaning that they too should “question, probe, explore, and in essence guide the discussion into specific areas” (p.2).

Findings of our study (Figure 6) indicate that surveyed teachers are more likely to *not* accept the student’s suggestion or try to explain it to him/her, thus maintaining the teacher-centered power relationship. Less than one third of teachers claim to be open to reconsidering the question and involving the student in its reformulation, therefore actively engaging the student’s critical thinking competencies. Examples of responses referring to each three categories are presented in Box 4.

Figure 6. Percentage of teachers supporting LtL competence (cognitive dimension), based on practices for (de)stimulating critical thinking (Q8)



Box 4. Examples of instructional practices with different levels of support towards developing the cognitive dimension of LtL competence (Q8)

(1) Teacher does not accept student’s feedback and maintains that the assignment is well communicated

I’ll try to explain that the questions are clear and precise.

(2) Teacher explains / reformulates the question

I try to understand the student, explain to her what the question requires.

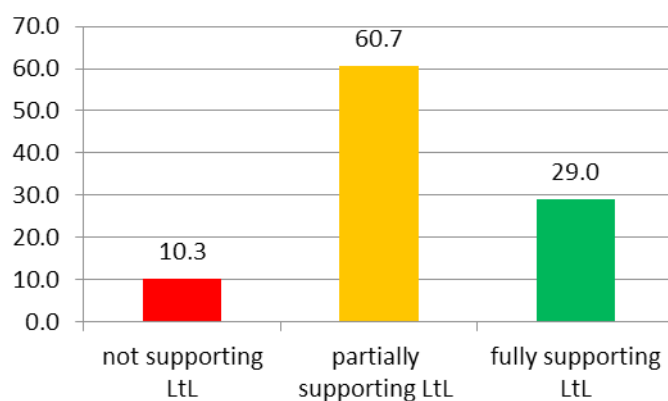
(3) Teacher asks the student what s/he finds unclear and/or attempting to engage him/her to reformulate the question

We discuss her opinion and then my choice for the formulation given, and if we determine inaccuracy, the question is being fixed.

The second hypothetical situation (Q9) assessing methods for stimulating critical/creative thinking describes a situation in which a student provides an unexpected response (not correct, but not completely incorrect). Teachers’ responses were classified according to three levels (1) teacher disciplines the student by asking him/her not to interfere with the work of the teacher; (2) teacher listens to the student, but does not accept the opinion; and (3) teacher listens, accepts and requires the student to explain the answer. The third category of responses is considered as most likely to encourage critical

and creative thinking within students, since it does not offer judgment on their opinion, and allows further elaboration. More than half of the responses (60.7%) fit into the second category, indicating that most teachers recognize the right of the student to provide a different/untypical opinion, but do not enable further development of the critical thinking skills. Somewhat more than a third of teachers would support the student in elaborating his/her response, thus stimulating the development of critical thinking, but also student's metacognitive capacities (see Figure 7), Examples of responses coded into the three abovementioned categories are provided in Box 5.

Figure 7. Percentage of teachers supporting LtL competence (cognitive dimension), based on practices for (de)stimulating critical thinking (Q9)



Box 5. Examples of instructional practices with different levels of support towards developing the cognitive dimension of LtL competence (Q9)

(1) Teacher disciplines the student by asking him/her not to interfere with the work of the teacher

I tell the student to try to provide specific answers when responding, to provide response to what the question requires and not about things unrelated to the question.

(2) Teacher listens to the student, but does not accept the opinion

I listen to him, but then I tell him the correct answer.

(3) Teacher listens, accepts and requires the student to explain the answer

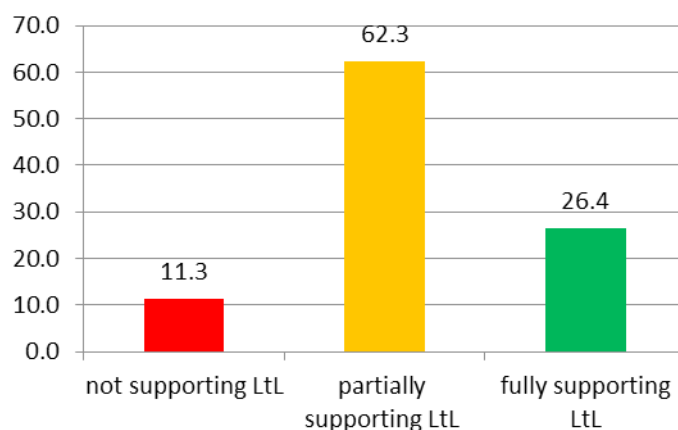
I motivate the student to explain the answer, to provide an example and allow more time for me to rethink the answer.

I initiate a discussion, which should lead towards a completely correct answer, but accept the arguments s/he puts forward.

The last hypothetical situation designed to assess teachers' use of methods for stimulating critical and creative thinking elaborates a situation in which the teacher is requested by a colleague for directions on how to stimulate students' active exchange of opinions (Q10). The provided responses are classified according to the following criteria:

(1) does not provide directions; (2) provides general directions (to be more creative, ask specific questions, use examples, etc.); and (3) provides specific directions (to implement activities requiring cognitive activity on behalf of students, ask open-ended questions, to not criticize for a given response, etc.). Abrami et al.'s (2008) meta-analysis indicates that the teacher's instruction is crucial in stimulating critical thinking within students. While there are diverse methods which can be used by the teacher, one of them is asking thought-provoking questions, which 'go beyond the facts to think about them in ways that are different from what is presented explicitly in class or the text' (King, 1995, p.14). King (1995) adds that by asking critical-thinking questions, teachers stimulate higher-level cognitive processes (analysis of ideas, comparisons, prediction, evaluation, etc.). According to data presented in Figure 8, surveyed teachers are not very likely to provide specific direction/support in this type of situation which has the potential to stimulate students' critical and creative thinking. Specifically, more than half (62.3%) would only provide general direction to their colleague, while only one in four would provide specific feedback which, if applied, is expected to support the development of the cognitive dimension of LtL competence. Examples of the three levels are provided in Box 6.

Figure 8. Percentage of teachers supporting LtL competence (cognitive dimension), based on methods (de)stimulating critical/creative thinking (Q10)



Box 6. Examples of instructional practices with different levels of support towards developing the cognitive dimension of LtL competence (Q10)

(1) Teacher does not provide directions

Would not advise. It is up to the teacher to decide on the type of questions.

(2) Teacher provides general directions

To be more specific when asking questions.

(3) Teacher provides specific directions

To ask open questions which require longer responses. To require from students to explain their responses and state their (dis)agreement with others.

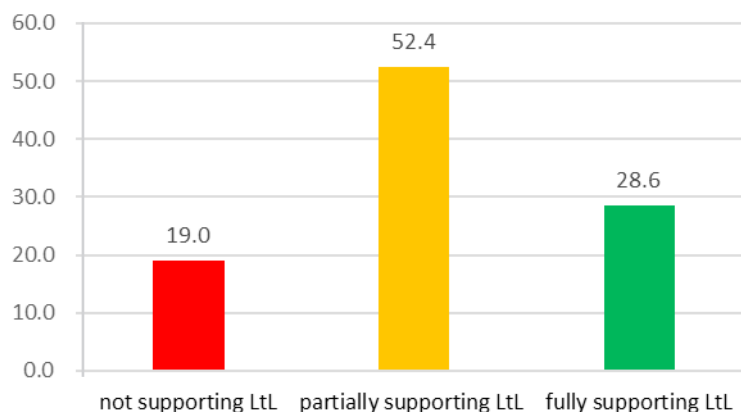
To constantly engage students in the lesson through asking for their opinion and checking their interest.

FREQUENCY AND QUALITY OF USE OF METHODS SUPPORTING DEVELOPMENT OF THE METACOGNITIVE DIMENSION OF LTL COMPETENCE

The metacognitive dimension (or thinking about thinking) is one of the more specific aspects of the Ltl construct, which distinguishes it from related constructs. Therefore, this aspect is rather difficult to assess, and the potential instructional methods stimulating it are challenging to elaborate upon. Nevertheless, it is an especially important dimension, found to be very strongly linked to student learning outcomes (Hattie, 2009). Hattie refers to metacognition as “higher-order thinking which involves active control over the cognitive process engaged in learning” and includes the activities of: planning “how to approach a given learning task, evaluating progress, and monitoring comprehension” (2009, p.188). In this regard, Dembo (2010) identifies the aspect of teaching students appropriate learning strategies as the basis for developing critical thinking skills, since the former deals with methods for processing and making sense of complex information, and the latter requires using the information to form a judgment/opinion, or as a basis for creating new knowledge. Through this, he pinpoints the inseparability between meta-cognition and critical thinking, both of which are crucial aspects of the Ltl construct.

In the questionnaire, used for this study, the level of stimulating this dimension of Ltl was assessed through two situations: (1) methods of directing/guiding students in their individual learning and consecutive enquiring on their learning process (Q6), and (2) providing directions for attaining higher-levels of learning (Q7). In the first situation (Q6), teachers’ responses were classified on three levels, specifically: (1) does not provide direction; (2) provides general directions; and (3) provides specific directions to guide the learning (examples provided in Box 7). Results indicate that half of teachers in the sample (52.4%) provide some type of directions, but they are usually rather general (to study with understanding, ask questions related to the material, etc.), and are therefore considered to only partially support the development of the meta-cognitive dimension of Ltl competence. However, nearly one-third of teachers reported to use more specific direction, including: focusing on things that interest the students, extracting the important information, asking questions (how, why, etc.) that have the potential to stimulate metacognition within students (Figure 9).

Figure 9. Percentage of teachers supporting Ltl competence (metacognitive dimension), based on methods for providing directions for learning (Q6)



Box 7. Examples of instructional practices with different levels of support towards developing the metacognitive dimension of LtL competence (Q6)

(1) Teacher does not provide directions to students

I don't give them assignments to learn on their own

(2) Teacher provides general directions to students

a. I provide directions, tell what is most important for them to know. To learn the content divided into bits, then connect them

c. (Assessment) through retelling the entire material, or discussion with students

(3) Teacher provides specific directions to students to guide their learning

Eg. 1

a. I suggest to them potential learning strategies (diagrams, tables, etc.)

b. (Ask questions) Which method have you used? Have you had any difficulties? How can you connect this with other subjects/topics?

c. (Assessment) through questions or practical assignments

Eg.2

a. To understand the essence of the lesson

b. (Ask questions) How did you arrive at that conclusion? What is it related to?

c. (Assessment) By giving tasks (with different levels of difficulty)

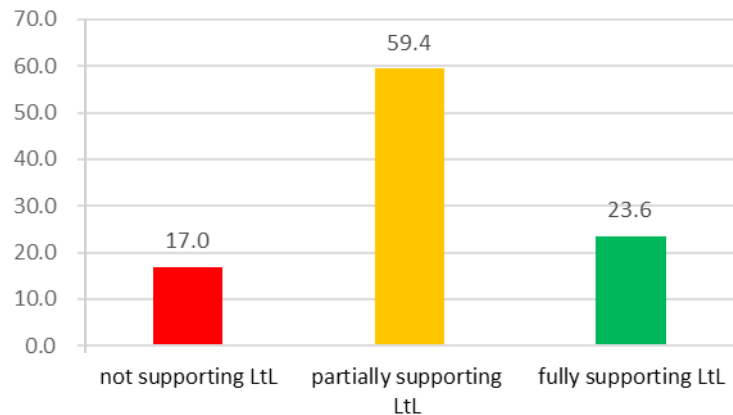
As Farrington et al. (2012) conclude from analysis of different studies, self-regulation is the strongest predictor of student performance compared to other non-cognitive factors⁷. The authors emphasize some of the most effective metacognitive strategies to be: “awareness of textual inconsistency” (understanding that a text contains logical inconsistencies) and “self-questioning to monitor and regulate comprehension” (self-guiding the learning through asking “what do I (don’t) know?”, “how well do I understand?” etc., as well as ‘metacognitive prompting’ (asking questions such as “what is this problem about?” or “what steps are you using to solve the problem?”) (p.43). Therefore, the use of specific feedback directed on the learning process and learning strategies is especially significant because it aids students in developing self-regulatory strategies.

Based on the abovementioned findings, in the current study, the second situation (Q7) aimed at assessing use of methods for stimulating metacognition, required from teachers to provide feedback on how to learn to students who have so far been ‘rote learning’, and hence increase the level of comprehension. The three levels of responses are similar to those from the previous question, and range from not providing directions to providing specific directions on the learning strategies. In this situation as well, the majority of teachers (59.4%) would provide general directions, which include learning with understanding, continuous learning, i.e. methods which

⁷ Such as: academic behaviors, academic perseverance, academic mindset and social skills

provide only limited potential to support LtL (see Figure 10). Only one in four teachers reported giving more elaborate directions, which include – offering/suggesting learning strategies, requesting from students to question themselves while learning, etc. Examples of the three levels are provided in Box 8.

Figure 10. Percentage of teachers supporting LtL competence (metacognitive dimension), based on methods for providing directions for higher-order learning (Q7)



Box 8. Examples of instructional practices with different levels of support towards developing the metacognitive dimension of LtL competence (Q7)

(1) Teacher does not provide directions

I give them additional tasks to practice

(2) Teacher provides general directions

To learn by using 'logic' and repeating frequently the content

(3) Teacher provides specific directions

To study with understanding, make connections and comparisons, discuss about the topic they study, analyze what they learn.

They are advised to analyze their written assignments with those of other students, understand on their own the omissions they made, and are provided directions and methods on improving their learning.

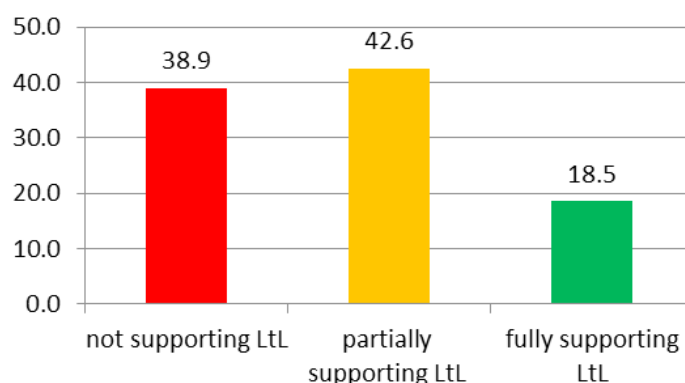
FREQUENCY AND QUALITY OF USE OF METHODS SUPPORTING DEVELOPMENT OF THE AFFECTIVE DIMENSION OF LTL COMPETENCE

The importance of the so-called non-cognitive factors for student achievement in school and later in life is increasingly being recognized by researchers and policy makers (Farrington et al., 2012). Therefore, the affective dimension of LtL is particularly important, as a motivator of the overall LtL construct. In this regard, the analysis aimed to assess the instructional methods for supporting ‘academic perseverance’: (grit, tenacity, delayed gratification, self-control), ‘academic mindset’ (entity vs. incremental mindset, belief in the importance of effort) and ‘learning strategies’ (self-regulated learning, goal-setting) (according to Farrington et al., 2012, pg.8-11)

The affective dimension of the LtL construct was assessed through four questions, primarily related to methods for motivating students through emphasizing effort over ability (intelligence) and stimulating intrinsic motivation for learning. Development of items 11-13 and their assessment criteria was guided by Dweck and Leggett’s (1988) Model of Implicit Theories of Intelligence which argues that peoples’ self-theories about intelligence are strongly related to the motivational style they are likely to develop. Entity theorists (those believing intelligence is a fixed trait) tend to adopt maladaptive motivational styles (learned helplessness or attenuated mastery), thinking there is nothing they can do to improve their ability and consequently their performance, so after a failure situation they tend to give up trying or seek to find ways to hide their ‘incompetence’ from others. On the other hand, incremental theorists (those believing intelligence is a malleable trait) do not lose confidence in their ability after experiencing failure, but simply decide to make more effort the next time in order to improve their performance (i.e. adopt mastery motivational patterns) (Mickovska-Raleva, 2010, p.13).

The first hypothetical situation required teachers to elaborate their response in a situation where a student holds a disbelief in his abilities, which manifests in the student not doing schoolwork (Q11). More than a third of teachers (38.9%) provided a response which is not expected to stimulate the affective dimension of LtL. Specifically, they (1) would advise the student to be more diligent, to perform his duties etc. Such feedback will likely not discourage the student, but also does not offer feedback related to the student’s self-concept. In total, 42.6% of teachers would provide general feedback including messages (2) to try harder, be more persistent, or would give the student easier tasks in order to increase his self-confidence. These responses were classified as partially supporting LtL competence since they tend to address the malleability of intelligence and the importance of effort, but do not provide specific feedback on improving the competences. Only one in five (18.5%) teachers elaborated a response which is fully in line with the LtL principles and includes (3) discussing with the student about the difficulties s/he faces, offering methods for supporting the learning process (through increasing interest, suggesting leaning strategies etc.). Examples of different categories of responses are provided in Box9.

Figure 11. Percentage of teachers supporting LtL competence (affective dimension), based on methods for providing feedback to support motivation (Q11)



Box 9. Examples of instructional practices with different levels of support towards developing the affective dimension of the competence (Q11)

(1) Teacher advises the student to be more diligent, to perform his duties

I would advise him to be more careful during lessons, to listen and perform the given tasks.

(2) Teacher provides a general feedback including messages to try harder, be more persistent

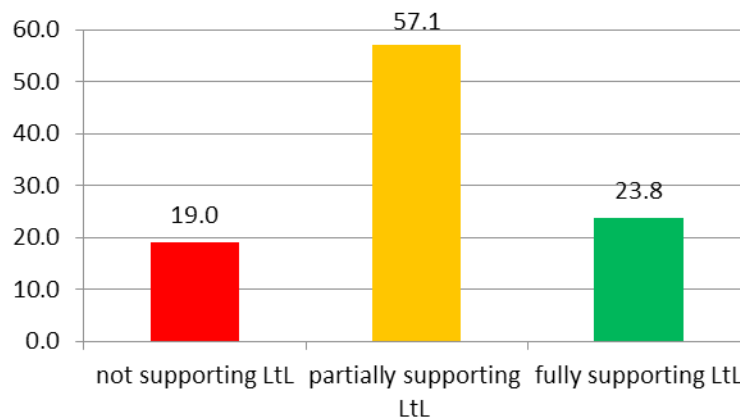
I would encourage him and point out that if he tries, he can achieve better results. Each lesson I would give specific, but not very complex tasks.

(3) Teacher discusses with the student about the difficulties s/he faces, offers methods for supporting the learning process

I will talk with the student about why he dislikes the subject and I'll find a method which will be interesting for him to learn

In a similar situation, where a student, otherwise performing well, gets discouraged by a low mark and attributes the result on her intelligence, the teachers were asked about the tasks they would give in order to raise her performance (Q12). One in five teachers (19%) would use methods not supporting the development of LtL, specifically (1) telling the student he is smart enough or emphasizing his previous achievements, which according to Dweck (1999) can be particularly demotivating for students with fixed mindset. In addition, the majority (57.1%) would respond by (2) emphasizing the importance of effort, not giving up, praising for the well performance etc., thus providing general feedback which is in line with supporting LtL competence although is not sufficient for guiding future performance. About a quarter of teachers (23.8%) elaborated methods which were assessed as fully supporting the affective dimension of LtL competence, by (3) providing specific assistance such as: gradually increasing the difficulty of tasks/assignments and thus improving the self-efficacy, offering learning strategies, encouraging questioning (Figure 12 and Box 10).

Figure 12. Percentage of teachers supporting LtL competence (affective dimension), based on methods for providing feedback to support self-confidence and motivation (Q12)



Box 10. Examples of instructional practices with different levels of support towards developing the affective dimension of LtL competence (Q12)

(1) Teacher tells the student he is smart enough or emphasizes his pervious achievements

I would remind him of the good results he has had before.

I would motivate him with a better mark if he tries.

(2) Teacher emphasizes the importance of effort, not giving up, praises for the good performance

I would explain to him and assist in solving a more difficult task, so he will reassure himself that he can do them.

(3) Teacher provides specific assistance/direction

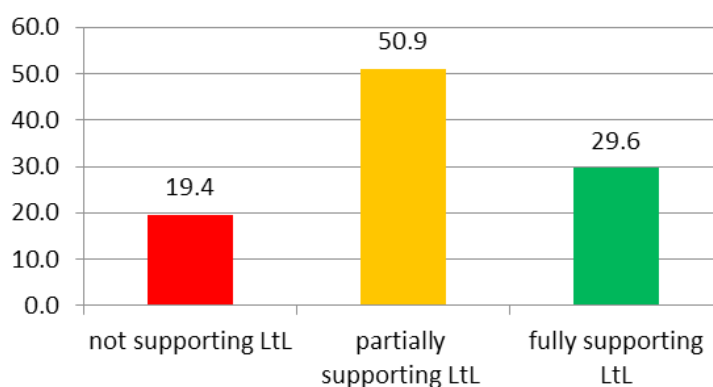
I would give him tests with assignments with increasing difficulty, until the student gains self-confidence that he can solve the more difficult tasks as well.

I would tell him that everyone can receive a low mark, and it is not a sign of the overall knowledge. I'll encourage him to take on more difficult tasks and praise him for the well performed assignments.

The situation described in Q13 is the opposite of the previous one, and presents a student that invests a lot of effort in schoolwork, but that investment does not reflect in a higher mark for the student. The teachers were asked to elaborate their response with regards to what the student should do in order to improve her achievement. Among teachers in the sample, 19.4% would only provide a general feedback to the student to (1) keep up working hard, without referring to the issue of the student's unsuccessfulness in achieving a higher mark, while half of respondents, apart from (2) emphasizing the importance of hard work would provide additional general information on his behavior (i.e. invite her to remedial classes). About one-third (29.6%) of responses detail feedback which

fully resonates with the principles of the LtL framework, such as addressing the learning approach, strategy, setting learning goals, focusing on the potentials and praising the effort invested (Figure 13). Examples of the three categories are provided in Box 11.

Figure 13. Percentage of teachers supporting LtL competence (affective dimension), based on methods for providing feedback to support motivation (Q13)



The low number of teachers providing specific feedback is concerning, bearing in mind the importance of the feedback for effective learning (Hattie, 2009). The feedback should not be considered as a reward, but should provide information about the task; should not be only focused on the incorrect responses, but also on analyzing correct ones; and should be tied to the learning goals (Hattie, 2009) in order for it to improve student's learning and make him/her aware of the requirements of the task, as well as her/his position with regards to the task.

Box 11. Examples of instructional with different levels of support towards developing the affective dimension of LtL competence (Q13)

(1) Teacher provides general feedback to the student

To continue studying regularly in the same manner.

(2) Teacher emphasizes the importance of hard work and provides additional general information on his behavior

To continue working, to direct her attention to the main goals and study with understanding. The success will come with the hard work.

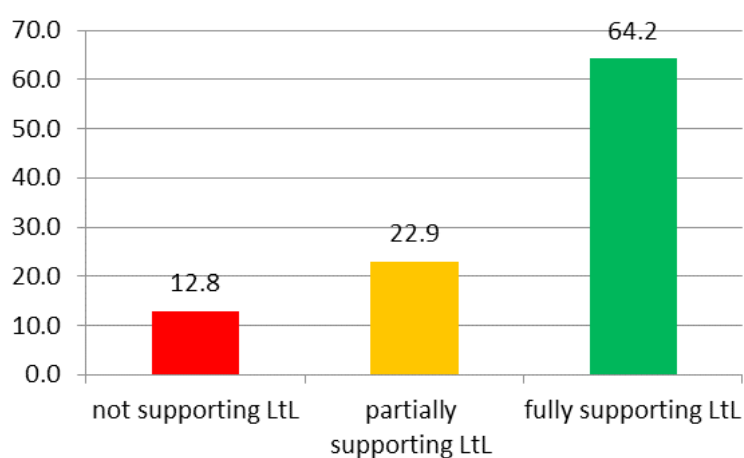
(3) Teacher addresses the learning approach, strategy, setting learning goals, focuses on the potentials and praises the effort invested

I would specify to the student what she should pay more attention to, which are the weaknesses, but would also emphasize her potentials which she should maximally utilize.

I would explain to her the goals she needs to achieve; the level her knowledge needs to be. I will support her to try her best.

The last scenario outlined in the questionnaire required teachers to explain their reaction when two students are disrupting the lesson by talking, although their talk is related to the topic of the lesson (Q14). Reactions supporting LtL were the ones which build on to the already existing interest of students and don't impede their intrinsic motivation. A majority of teachers (64.2%) would use this situation in consistence with the LtL framework, by (3) trying to raise the issue/discussion to the level of all-class discussion, while a smaller number would either (1) discipline students to be quiet and listen (12.8%) or (2) tell them to listen first and then discuss (22.9%), hence completely ignoring the intrinsic motivation in the former case, or only partially recognizing it in the latter (Figure 14, Box 12).

Figure 14. Percentage of teachers supporting LtL competence (affective dimension), based on methods for providing feedback to encourage intrinsic motivation (Q14)



Box 12. Examples of instructional with different levels of support towards developing the affective dimension of LtL competence (Q14)

(1) Teacher disciplines students to be quiet and listen

To pay attention at what I'm saying, because they will be asked afterwards.

(2) Teacher suggests to students to listen first and then discuss

I'll suggest to them to listen to what I'm saying, and tell them that their discussion can be shared with the class afterwards.

(3) Teacher tries to raise the issue/discussion to the level of all-class discussion

I will ask them to express their opinion about the topic publically and initiate a general discussion.

I get involved in their discussion, tell them they should share their opinions with the rest of the class.

In summary, teachers rarely consistently and systematically use methods which are likely to support the development of LtL competence. Most use combination of methods,

some of which are in line with the LtL concept, most likely its affective dimension, while less likely its cognitive dimension. This implies that teachers, have a certain repertoire of knowledge and practices to support the development of the competence, such as: variety of student-centered approaches, requesting and accepting student's feedback, focus on effort rather than ability, methods for providing strategy-oriented feedback, stimulating critical reflection through self-questioning and similar meta-cognitive strategies, etc. However, only about one in four teachers uses these methods consistently throughout different learning situations, half use them only in some situations, while one in five do not use any of the methods likely to stimulate LtL competence.

INSTRUCTIONAL METHODS AND OTHER VARIABLES

In order to understand the interaction of the instructional methods used, classified according to the LtL framework, with other relevant variables – correlational analyses were conducted. The composite variables were correlated with variables such as: school location (urban/rural), teachers' age, years of working experience as teachers, level of formal education attained, number and type of attended trainings, opinions on the level of cooperation within the school, and the level of satisfaction with the teaching profession. The analysis indicated that:

- The **location of the school** where teachers work (rural/urban) is not related to the frequency of use of methods supporting LtL competence (as a composite variable) ($r=-0.93$, $p>0.05$). This is rather encouraging finding pointing to the fact that students from rural schools (typically from disadvantaged backgrounds) do not receive lower quality of instruction. However, it also indicates that teachers of disadvantaged students do not put in extra effort in stimulating the LtL competence within students, considering that their influence in this regard should override the deprived socio-economic status of the family.
- **Teacher's age and the years of working experience** were not related to the overall frequency of use of methods supporting LtL competence ($r=-0.18$, $p>0.05$). However, younger teachers were found to be more likely to report using methods for stimulating the cognitive dimension of LtL. This finding is somewhat expected bearing in mind that younger teachers have been more exposed to contemporary teaching theories and practices during their formal education, but also participated in more in-service trainings (as questionnaire data indicate). Hence, they are expected to be more aware of the variety of student-centered methods and transfer them into their teaching practice.
- Teachers with higher **levels of formal education** tend to report higher use of methods supporting LtL ($r=0.204$, $p<0.05$). The finding indicates that formal education plays a role in developing the repertoire of teaching strategies and being more proficient in applying different instructional methods in practice.
- While the overall number of **attended trainings** is not related to the frequency of use of LtL methods ($r=0.025$, $p>0.05$) there are links with certain attended trainings. Specifically, teachers who have attended training in formative assessment were more likely to report using specific feedback as motivational method to increase

achievement ($r=0.308$, $p<0.05$ for Q13). Moreover, teachers who have attended the Thinking Mathematics training, which introduced instructional methods for increasing critical thinking and problem solving skills, tended to report providing more directions to students on how to learn and hence develop their metacognitive skills. While there is possibility that teachers who attended the trainings are also more motivated and determined to further develop their skills, the findings nevertheless emphasize the importance of continuous professional development in finding appropriate methods for supporting students' competencies.

- The analysis did not indicate any relation between the **opinions on the level of cooperation on different levels** and the instructional methods used ($r=0.095$ for cooperation with support staff, $p<0.05$; $r=0.109$ for cooperation with school management, $p<0.05$; $r=0.089$ for cooperation with teachers, $p<0.05$), potentially indicating that what the teacher does in the classroom is unrelated to the school climate, but is mainly dependent on the teacher's personal motivation and skills.
- **Teacher's mindset** was found to be positively correlated to the composite variable-LtL methods ($r=0.21$, $p<0.05$) indicating that teachers with entity mindset are less likely to use LtL supporting methods, while those with incremental mindsets are more likely to use such methods. These findings are rather intuitive, bearing in mind that the incremental mindset is found to be linked to many of the aspects of the LtL construct, in particular its affective dimension (pursue of learning goals, self-efficacy, etc.), but also the metacognitive dimension (finding the most-effective learning strategies, self-regulation, etc.).

It can be concluded that teachers who are more likely to use instructional methods which support the development of LtL in their practice have higher education (four-year university and post graduate degree), are younger, have attended more trainings, and have an incremental mindset (i.e. a belief that the intelligence is malleable). The social structure of the school (assessed indirectly through the school location), and the satisfaction with the levels of cooperating with different school-based stakeholders is not related to the frequency or quality of use of LtL supporting methods. The section below elaborates profiles of teachers with different levels of use of LtL methods, and relates their instructional practices to their understanding of the LtL construct.

HOW TEACHERS UNDERSTAND LTL AND TRANSLATE IT INTO INSTRUCTIONAL METHODS: QUALITATIVE RESULTS

In the following section, findings from the semi-structured interviews are presented. Five interviews were conducted, two of which with teachers who were found to consistently and systematically use instructional methods supporting the development of LTL competence, and three interviews with teachers who were unsystematically using such methods.⁸ Teachers' concepts of the construct are presented in the form of cognitive maps, which outline the relationship between different concepts.⁹ The cognitive maps are additionally elaborated for each teacher separately and for all teachers comparatively. The characteristics of teachers are presented in the following table.

Teacher	Usage of LTL	Subject	Type of school
Teacher A	Consistent	Mathematics	Rural, majority Macedonian students
Teacher B	Consistent	Foreign language	Urban, majority Roma students
Teacher C	Inconsistent	Natural sciences	Rural, majority Macedonian students
Teacher D	Inconsistent	Social sciences	Urban, majority Macedonian students
Teacher E	Inconsistent	Mother tongue	Urban, majority Macedonian students

TEACHERS CONSISTENTLY USING METHODS SUPPORTING LTL

Teacher A teaches mathematics in a small rural school. Responses on the Malleability-of-intelligence-scale indicate that she holds an incremental theory of intelligence, considering it to be malleable characteristic. During the interview, she noted that having ability itself is not sufficient, but intelligence needs to be worked on in order to achieve results. In this regard, the subject she teaches - mathematics - can be considered as very beneficial, as she puts it: *“Maths is like a sports for the brain”*, meaning students can improve/strengthen their skills through practice and focused developed.

⁸ Based on survey results.

⁹ In the conceptual maps, a full arrow signifies a consistent link between the concepts, while an interrupted line-inconsistent link between the concepts

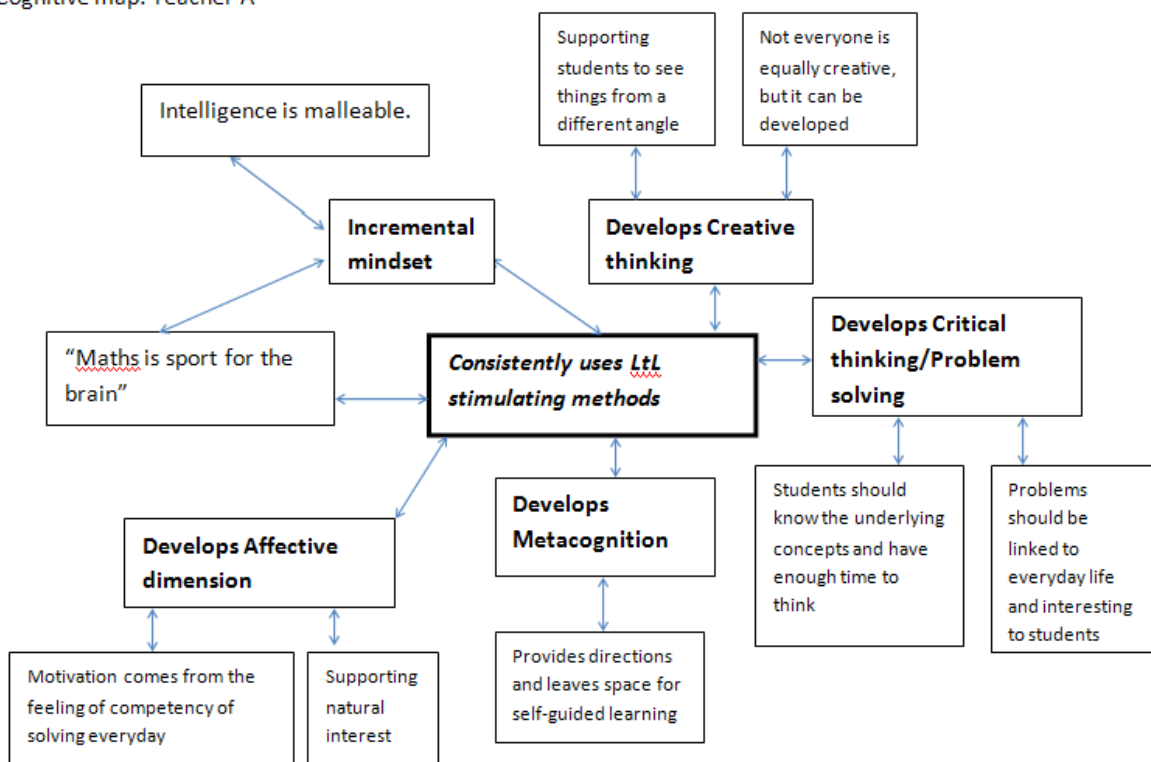
With regards to the cognitive dimension she believes there are two main characteristics students should possess in order to be able to solve problems and think critically: 1) the problems should be related to their everyday lives and interesting to students: 2) students should have prior knowledge of the underlying basic concepts and be given sufficient time for solving the problem. The interest would come if the student considers the problem to be linked with situations with which students are familiar. In addition, the teacher should allow time for thinking, contemplating on the problem. She links this concept closely to creative thinking, which also requires having space and time for individual work, but can also be supported through techniques such as brainstorming and valuing divergent thinking.

The teacher considers it very important to develop skills for self-guided learning within students and develop their ability to set personal challenges and not give up. Such beliefs demonstrate a thorough understanding of the interrelation between the metacognitive and affective dimensions. She is aware of the role of the teacher in this respect, she views herself as a guide for advising students how to learn and setting individual assignments, based on their current attainment level. The teacher perceives individual work as very important for developing skills for learning, noting that *“it is better to do your homework alone and make a mistake, than copy a correct one”*, and emphasizing the importance of learning from their own mistakes.

Through her philosophy on independent learning, she demonstrates the importance of self-awareness for successful learning, emphasizing that *“the student should be aware that s/he needs to understand the things on his own, otherwise, s/he can’t learn them”*.

Regarding the affective dimension, Teacher A exhibits a thorough understanding of the concept of intrinsic motivation through the opinion that solving a problem should be satisfaction in itself and that effective learning is difficult to achieve if not related to the competency of solving everyday problems, i.e. students’ feeling that what they learn is interesting and meaningful. (See picture: Cognitive map-Teacher A).

Cognitive map: Teacher A



Teacher B teaches foreign language in a school with majority Roma students. She was found to also hold an incremental mindset and consider intelligence to be a malleable trait which can be developed if one is persistent in learning. According to her, developing non-cognitive, behavioral competences within students is more important than cognitive competences. Nevertheless, cognitive competences are also very important and she can in great detail explain what it means for students to be able to solve problems, to think critically and demonstrate creativity. She adds that for students to be aware of their personal strengths and weaknesses (metacognitive awareness) is very important, and the teacher should direct them towards identifying these strengths.

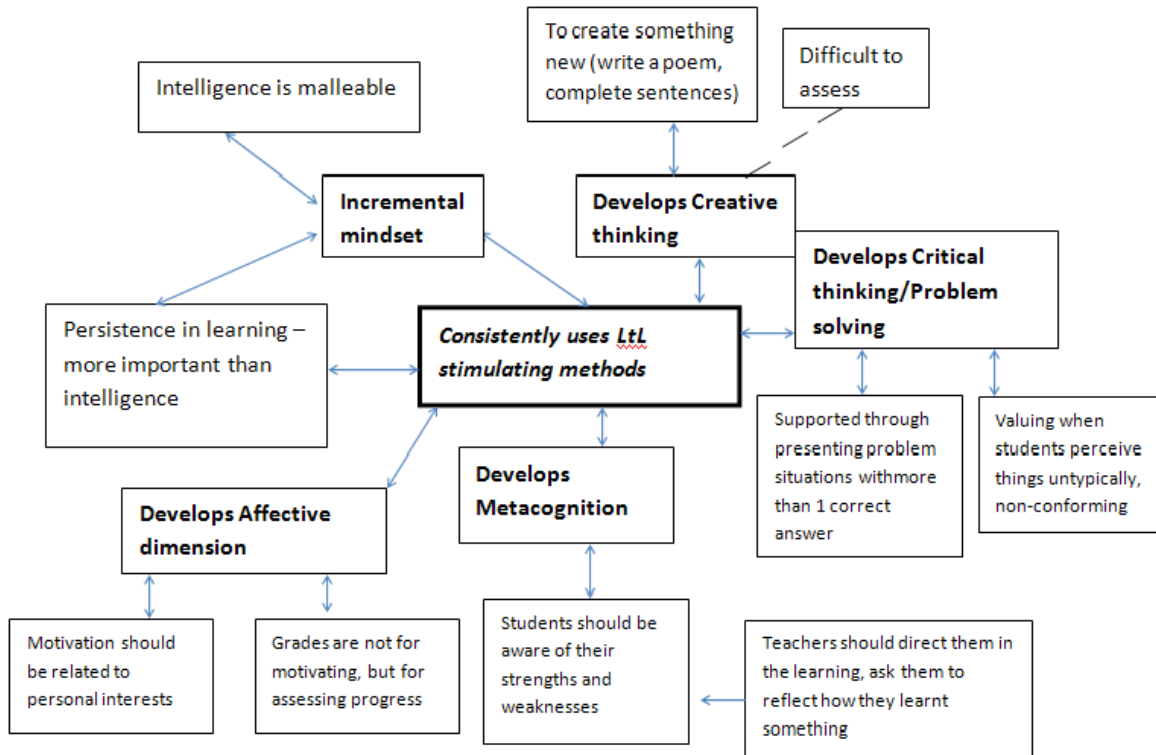
Teacher B accentuates the importance of feedback in assessing the development of metacognitive skills, specifically, asking questions how they have learned something, checking whether the manner they learn is appropriate for the student or a different approach should be recommended, asking how they have acquired something, what were the challenges, why was it easy/difficult. *“We discuss frequently about their learning”*, she notes, referring to classroom discussions she facilitates with her students.

Concerning the affective domain, Teacher B clearly distinguishes between intrinsic and extrinsic motivation, and considers the former to be stimulated by working on issues which are relevant to students, connected to their real life (the topics differ with regards to age/grade). Accordingly, she does not consider marks to be an effective motivator, and defines their goal for only assessing achievement of certain standards.

However, she is critical with regards to the possibilities the curriculum provides for development and assessment of the competences outlined above, as well as the formal knowledge of teachers to systematically address them. But recognizing their importance, successful teachers can find ways to overcome these obstacles. *“The curriculum is ‘packed’ with contents”* she commented. *“We have never been consulted when they were made. We try to think of ways to make it relevant to students, adding materials (...).”* When explaining how she managed to stay committed to providing relevant materials for students, she said *“Teachers don’t have knowledge on this, only experience. We exchange experience. If you don’t have love for your profession, no intrinsic motivation, you won’t develop.”*

With regards to lifelong learning, she links it with her personality and ongoing curiosity. She considers that LtL of competences can be developed in school, but that students’ fear of failure needs to be addressed first. *“They [students] need to feel free that if they have made mistake, they should try again, find a way.”* (See picture: Cognitive map-Teacher B)

Cognitive map: Teacher B



TEACHERS INCONSISTENTLY USING METHODS SUPPORTING LTL

Teacher C works in a rural school, teaching natural sciences. While she holds an entity mindset, she has somewhat contradictory opinions on the importance of ability for success, from believing that student with average abilities could not attain the highest achievement level, but also considering that being persistent is most important for success in life. Related to the first strand of belief, she adds that working with diverse groups of students, with different intelligence and upbringing, limits the teacher in attaining the same effect with everyone.

She holds that the contents of what teachers present should be applicable to students, and this allows students to develop interest in the subject/s. While recognizing the variety of methods teachers can use to develop different cognitive competences, she noted that teachers are limited with regards to resources, required to tightly follow the curriculum and teach according to the textbooks.

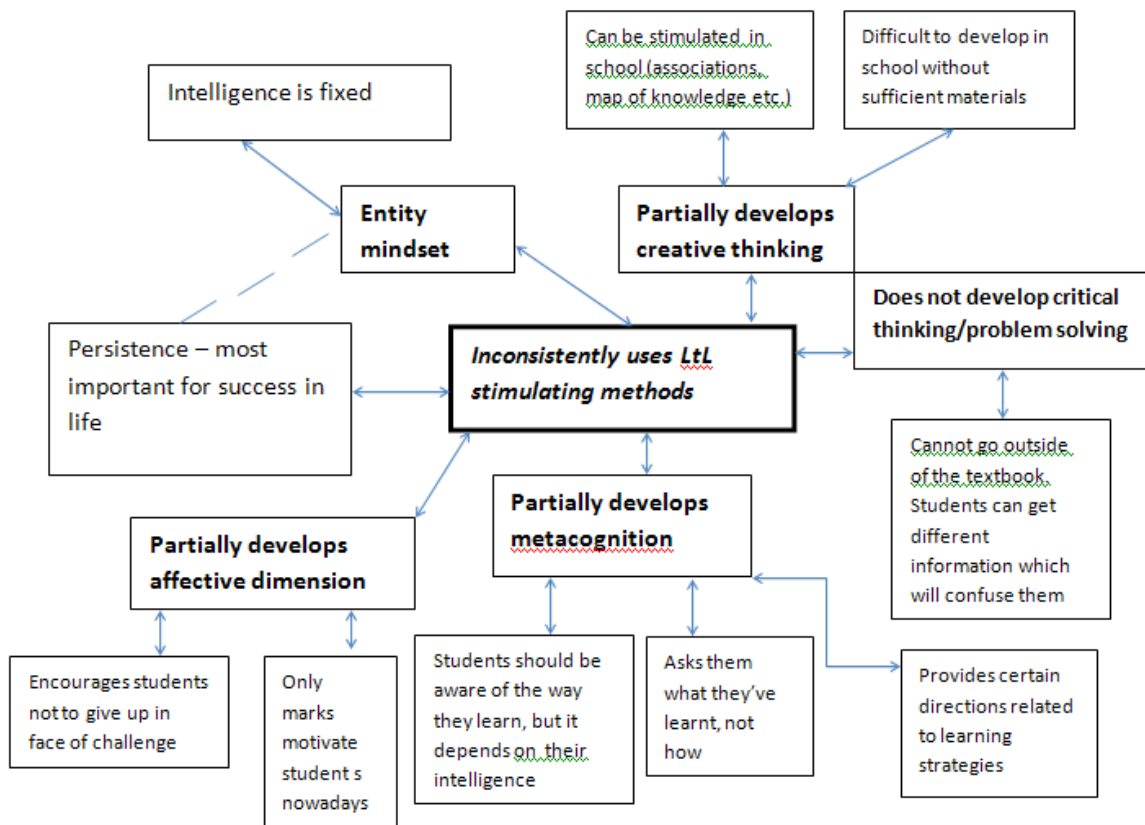
Teacher C's comment that she "*cannot go outside of the textbook since students can get different information on the same thing and it can confuse them*", indicates that she does not see the value of multiple means and information available as a potential for learning, possibly through methods such as creating a cognitive conflict and an opportunity to discuss the changing nature of knowledge and science. Therefore, she limits her students' opportunities to develop critical thinking skills.

With regards to metacognition, she holds that it is important for students to be aware of the way they learn, and although the teacher can influence this, it is useless if it is not

supported/continued at home. She provides general directions on how students should learn (read paragraph by paragraph, repeat, and then retell the whole content; study with understanding; use self-assessment), but notes that since the “*curriculum is rigid, it does not allow assessment of the process of learning (...) We ask them what they learned, not how they gained the knowledge.*”

Teacher C has unclear understanding of the affective dimension of Ltl and is unable to describe what motivates students to learn, recognizing that it is difficult to get students interested/motivated nowadays. She lamented that “*Students are not interested lately. They are neither motivated by grades nor learning*”. On the other hand, she contends that receiving good marks motivates good students, but they are not interested in gaining lasting knowledge.

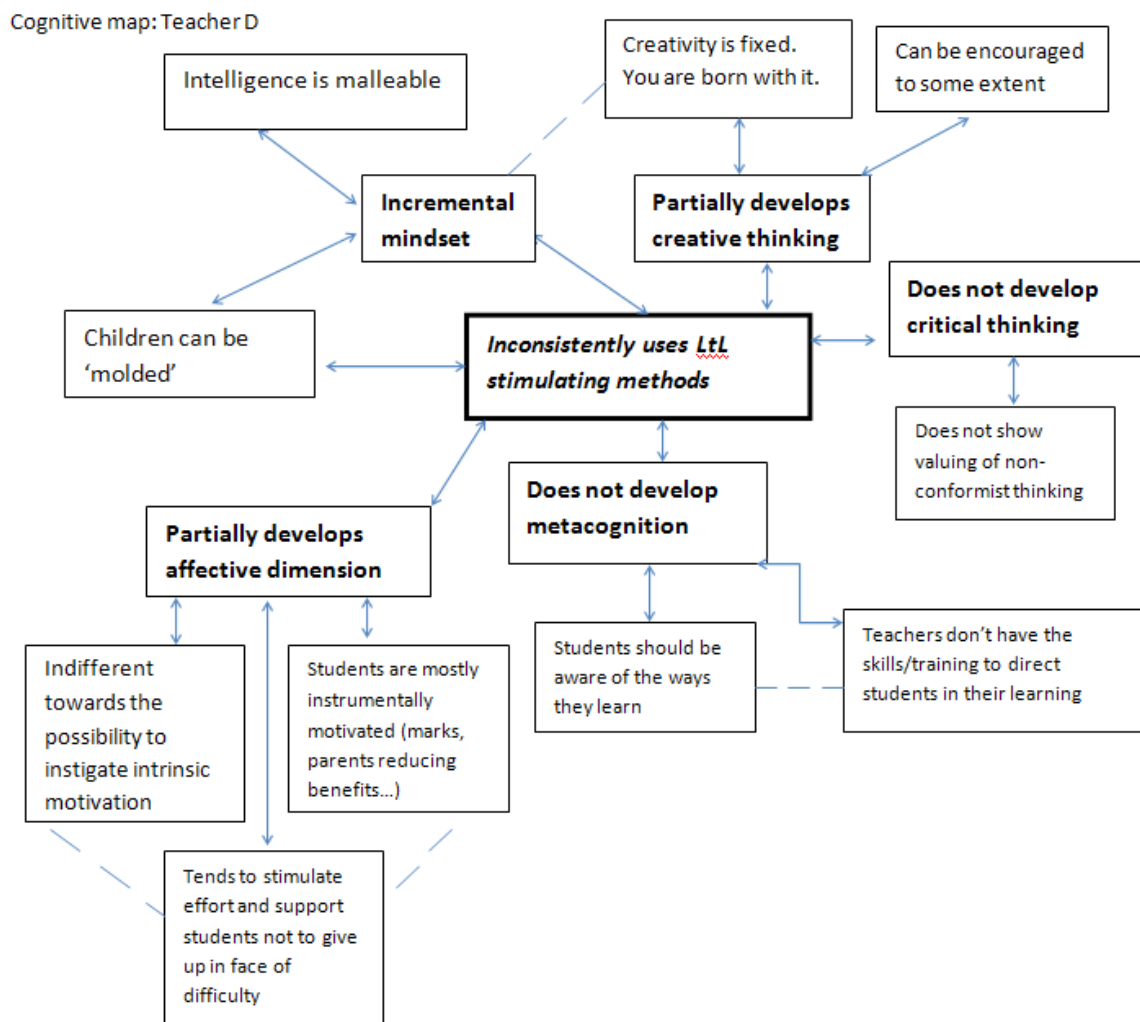
Cognitive map: Teacher C



Teacher D works in a central urban school with majority ethnic Macedonian students. She holds an incremental mindset, but expresses inconsistencies with regards to this construct. While believing children’s abilities can be “molded”, she believes that creativity is something a person is born with, and hence a fixed trait. This is an interesting position considering she teaches literature, subject in which creativity should be particularly stimulated.

She has an inconsistent position on the importance of cognitive skills and the possibilities for their development within the school, commenting that “*not everyone is capable of thinking creatively, it can’t be learnt, it’s something you carry with you-a sort of natural intelligence.*” Although she considers that students should be aware of the ways they learn and acquire knowledge, she does not clearly define how such awareness should be developed and admits that teachers don’t have the skills/training to direct students in their learning.

With regard to the affective domain, Teacher D considers students to be mostly instrumentally motivated (by marks, parents reducing certain benefits, etc.) and feels indifferent towards the possibility to instigate intrinsic motivation. In general, she holds an unstable concept about LtL competence and its compositional aspects, which reflects in the inconsistent use of methods for supporting it.



Teacher E teaches social sciences in an urban, majority ethnic Macedonian school. He holds a mixed mindset, and a belief that while intelligence is a fixed trait, if motivated, one can achieve success in school and in life.

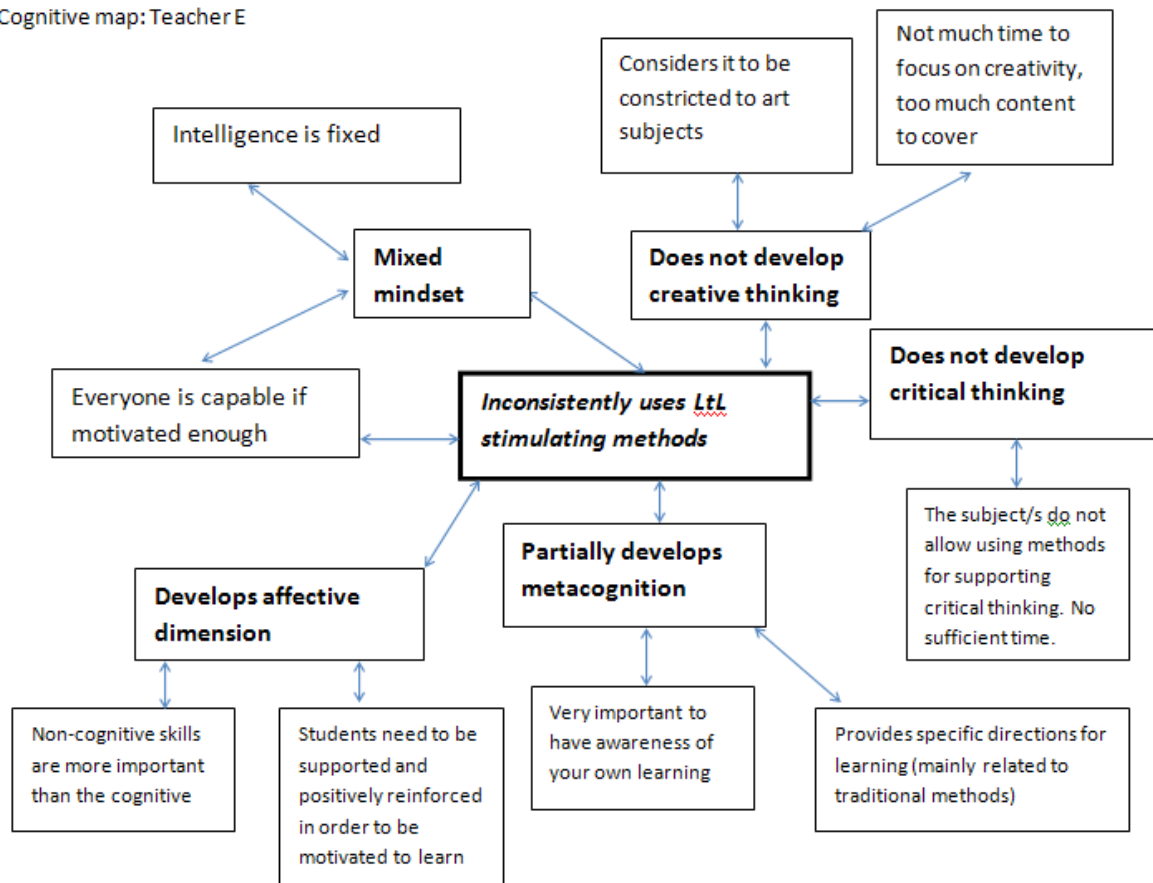
He does not have a clear concept of the cognitive skills students should develop, and considers non-cognitive skills (social and interpersonal skills, such as socializing, helping, solidarity) as more important than cognitive. Therefore, he tends to place more focus on these aspects during teaching and does not relate the possibility for development of critical thinking skills with his subjects. Instead, he links the concepts to mathematics instruction and project-activity. Likewise, he considers that the competency of creative thinking is frequently neglected during his lessons and is in general constricted to art subjects.

Teacher E claims to provide general directions for learning: he underlines important aspects, suggests the students to make concepts, retells concepts in short; and while

noting that awareness of how students learn is very important, he notes that the system does not support and teachers lack skills for supporting these competencies.

He tends focus on developing the affective dimension of the LtL construct, recognizing students' need for support and encouragement and the importance of teachers in providing positive reinforcement as motivation to learn, noting that *“Students are in dire need of support and encouragement. They need to be supported and positively reinforced in order to be motivated to learn”*. However, he does not make clear distinctions between intrinsic and extrinsic motivation and uses methods for encouraging both in parallel.

Cognitive map: Teacher E



HOW DO TEACHERS UNDERSTAND LTL AND IMPLEMENT IT IN PRACTICE?

There are vast differences among teachers with regards to their understanding of the LtL construct and its compositional dimensions. However, there is a clear link between the level of comprehension of the concept and the instructional strategies used in different classroom-based situations. More systematic understanding of LtL is related to more consistent use of methods. Although the teachers who consistently used LtL did not have formal knowledge of the construct, they have intuitively developed stable and logically interconnected implicit theory of how the components of LtL competence interact and how they can be stimulated. On the other hand, teachers holding unstable construct

understanding of LtL translated this into their practices, which do not systematically support LtL within students.

Data indicate that an implicit theory of intelligence is not necessarily related to the instructional methods used - a finding which has been confirmed by studies before (Mickovska-Raleva, 2010). Although teachers holding incremental theory of intelligence are more likely to consistently use methods stimulating LtL competence, those inconsistently using such methods can hold different implicit theories with regards to the malleability of intelligence and related constructs.

One important finding is that all interviewed teachers agree that it is important for students to learn how to learn, although the ones inconsistently using LtL stimulating methods recognize that they are not equipped with knowledge and skills on how to support students in attaining this competence. On the other hand, teachers consistently using LtL supporting instruction tend to constantly build on their personal experience and develop their professional competencies individually, even though the system does not require this from them. Importantly, all interviewed teachers confirm that the curriculum does not specifically require them to address this competence within students, although it requires development of some aspects of the competence (ability to think creatively, solve problems, etc.). Hence, they are not systematically presented with an overview of how the different aspects of the competence interact and how they can be stimulated.

LEARNING TO LEARN FROM THE STUDENTS' PERSPECTIVE

The following section provides the student perspectives on the instructional methods used by teachers, in terms of their variety and potential to stimulate different LtL dimensions. It is based on data collected through five FGDs with ninth-grade students from five schools.

ARE STUDENTS STIMULATED TO THINK OR ONLY MEMORIZE?

Students commented that they are rarely cognitively stimulated during lessons. They report that lessons are mainly conducted in a traditional manner, with the teacher being the transmitter of knowledge, and students as passive recipients. In these types of teacher-student relationships, there is a strong power imbalance in favor of teachers, which leaves students with little or no autonomy to act upon their interests and develop competencies for self-directed learning. Although the method of lecture is not inherently ineffective, it can be useless if not combined with other methods intended to stimulate interaction.

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"The teacher talks for 40 minutes, asks questions and answers them by herself."

Student from urban, majority ethnic Macedonian school

It was confirmed by all students that traditional style of teaching (i.e. lecture) is the most frequent one. In addition, it was also noted that these types of lessons are usually the most boring ones for students. They rarely listen carefully and typically forget what has been said after they leave the class. Nevertheless, they appreciate the lectures if the teacher is able to explain the content well and allows them to question afterwards.

This does not mean that students were not exposed to contemporary teaching methods or expected to stimulate their creativity and critical thinking. On the contrary, almost all students have had some experience with such methods. According to them, these types of lessons are considered as most interesting. They include: experimenting, quizzes, interesting ways of presenting the material by teachers, preparedness from the teacher to respond to questions, use of additional materials (besides the textbook). However, as confirmed by participants in all five focus groups, such lessons are rare.

When elaborating on different types of student-centered methods they have experienced, students report that they mostly work on “problem solving” during mathematics and science classes, but have also used this approach during certain civic education classes and language classes, where they were required to relate the content to real-life context. Students find these lessons as particularly interesting, engaging and effective for better understanding of the material.

“We were faced with a conflict situation and had to find ways of pacifying it, assisting. (...) We would like to have more lessons such as that one, related to life, it is easier to learn that way.”

Student from urban, majority ethnic Macedonian school

“Few years ago, we learned about media during Macedonian language class and the teacher gave us content to present it in the form of a TV show.”

Student from urban, majority ethnic Roma school

The lessons in which students were given opportunity to ‘defend’ different conflicting positions through discussion have also been rare, and in two of the schools where focus group discussions were conducted they haven’t occurred at all. It can be concluded that students were rarely in a position to use different types of information in order to form an opinion and/or critically evaluate an opinion.

“We haven’t had such lesson, but it would be interesting.”

Student from a rural, ethnically mixed Macedonian-Albanian school

“In civic education we played ministers and parliamentarians and had different roles, position and opposition. (...) This helped us learn better.”

Student from urban, majority ethnic Macedonian school

While students claim to have had numerous opportunities to conduct a research on a certain topic, further enquiry on the process indicates that their conceptions of what a ‘research’ entails are very basic. Typically, the teacher requests they find additional information for a topic, and write or paste it (along with pictures) on a large piece of paper. This is usually the product of the student’s research project. However, since teachers rarely provide more specific directions with regards to the process and final effects, the ‘projects’ come down to copy-pasting information from Wikipedia and most students have the same information. Thus, the natural curiosity of students to learn through discovery is not being sufficiently supported and the higher-order thinking is usually not being activated through these tasks.

Evidently, teachers rarely systematically stimulate higher order thinking within students through instructional methods. The assessment methods also focus on the lower cognitive levels, by basing learning on memorizing and reproduction of data and factual information. The main source of information is the textbook and the most used method applied by teachers was rote learning. Even though teachers require understanding of the material, they do not explain to students what it means to ‘study with understanding’ and typically assess the ‘verbatim’ reproduction of the material with the highest mark, rarely examining student’s actual understanding of the content.

As for the methods of learning, the most common is – reading the lesson and retelling it. Some students tend to make short lesson plans outlining the most important aspects of the lesson, others underline in the textbooks. However, none of the more elaborate techniques are used that would reflect LtL strategy (i.e. making schemes, self-questioning, consulting additional sources to compare/contrast information, etc.), as students claim they do not have time for such strategies and teachers haven’t directed them in how to use them. Most of the teacher directions refer to learning gradually, to try to understand the content and to make short breaks between learning. While these instructions are in line with cognitive science’s ideas on effective learning (Brown, Roediger, and McDaniel, 2014), they primarily apply to lower-level cognitive skills. Students tend to conform to teachers’ expectations and most of them report they do not have the time, nor interest, to explore certain content in depth, since they are overburdened with subjects, tests etc.

HOW INTRINSICALLY MOTIVATED ARE STUDENTS?

Students reported that they are typically bored during lessons and do not find them stimulating. Interactive lessons stimulate students to continue learning slightly more than lessons with traditional methods. However, learning is based on instrumental motivation primarily, and the motivation to study for better marks. Satisfying parents and/or teachers significantly outweighs the motivation to learn for the sake of learning/knowing/gaining competency. Rarely had they been motivated by some subject/content to continue learning/exploring after the lesson ended.

One method aimed to stimulate student’s intrinsic motivation is to provide them the possibility to individually select certain part of the material, and ‘building up’ the teaching upon their already established interests for a topic. However, all student participants in the focus groups reported they did not have such opportunity, although they would like to be able to choose based on their interests. Moreover, they don’t feel they have agency to intervene in any way with regards to what is being taught and the manner it is being taught.

“They won’t accept our ideas if we recommend how to work during lessons”

Student from a rural, ethnically mixed Macedonian-Albanian school

Only few students mentioned a situation in which a topic interested them to the extent they were self-motivated to explore the issue after returning home from school. For the most part, however, teachers directed the learning experience in their lessons and assignments were standardized.

“Once we learnt about Macedonian history and I got interested and researched some things at home on the Internet, and questioned my grandparents.”

Student from an urban, majority ethnic Macedonian school

“Last year we did some experiments during Chemistry class. I got interested and upon returning home, I watched similar experiments on the Internet.”

Student from urban, majority ethnic Roma school

In general, the vast majority of students admitted that their main motive for learning is to receive good marks (to be able to enroll in the desired secondary school, satisfy their parents etc.). Likewise, if it weren't for marks, they probably would not study the majority of subjects, with the exception of English language, which is considered to be the most important subject. Focus group participants described scenarios that were far from LtL strategies described in the sections above. For the most part, students were only motivated by external reinforcement and were not stimulated to learn on their own.

DO STUDENTS THINK ABOUT THEIR LEARNING?

From the information reported by teachers it was evident that providing specific feedback on the learning process and assessing the learning methods/strategies are some of the least frequently employed techniques used in schools. Students also confirmed that they either do not receive feedback by teachers related to their learning, or receive very broad/general directions. The directions mostly refer to the process of learning, which some teachers emphasize should be systematic, “read one paragraph, then repeat. Then another paragraph, etc.”

Without specific directions from the teacher on what is required in terms of learning goals and potential methods for achieving them, students employ the following learning strategies while studying at home: reading the content and retelling it, underlining important points in the textbook, making concepts with the most important ideas. However, many also noted that they tend to learn the contents ‘verbatim’, as written in the textbook, because that is the most certain way to receive a good grade.

“By heart, there are some words we don’t understand and they [teachers] don’t explain them to us.”

Student from an urban, majority ethnic Macedonian school

Few students said they sometimes use different techniques for connecting the content and making relations between concepts, such as schemes, concept-maps etc., but almost never practice these techniques while studying at home, since they do not see a need nor a value in going steps further what is required by the teachers. As some students put it:

“You need one hour to learn one lesson, and there are many lessons. We don’t have time to make schemes.”

Student from an urban, majority ethnic Macedonian school

“I don’t go into so much effort. No point.”

Student from urban, majority ethnic Roma school

When asked about the importance of receiving specific feedback from teachers, all students agreed that it is very useful and it is easier for them to study once the teacher directed them how, then when they are left on their own, without directions.

Finally, it is important to note that there were no large differences in the responses of students from different types of schools (with regards to location and/or ethnic composition). Their experiences are very relatable, which is consistent with findings from the PISA 2015 assessment (OECD, 2016) indicating no significant differences in attainment among schools in Macedonia.

CONCLUSIONS AND RECOMMENDATIONS

This study examined the use of instructional strategies used by teachers in Macedonian schools and assessed how much they incorporate elements which should support development of LtL competence. Data indicate that a majority of teachers tend to use certain instructional methods which support LtL competence. However, only one in four teachers was found to report applying such methods consistently and systematically. This implies that teachers are not trained to use LtL supporting methods, but they are also not required to use them, which leaves the decision on the type of instructional practices used on the teacher and his/her personal motivation for continuous professional development. The analysis indicated that teachers who are more likely to use instructional methods which support the development of LtL in their practice have higher education (four-year university and post graduate degree), are younger, have attended more trainings, and have an incremental mindset (i.e. a belief that the intelligence is malleable). Moreover, the style of a teacher and his/her instructional methods were not found to be related to the environment s/he works in (urban or rural school) or the type of students s/he works with (ethnic background).

The question arising is – how can the issue of developing LtL competence be addressed on a systemic level, in order for each stakeholder to know his/her objectives and have the tools for achieving them. As studies find, critical thinking skills (one of the core aspects of the LtL competence) are important to be incorporated as an explicit objective of the course/subject and embedded into the content, in order to be translated in the instruction (Abrami et al, 2008). However, the impact is even greater if this is combined with a training or other professional development interventions related to teaching the skill (Abrami et al. 2008).

However, in the case of Macedonian teachers, the first requirement (introduction of LtL in the curriculum and the subjects' content) is inconsistent, while the second (receiving specialized training for stimulating LtL) is almost non-existent. As described by the teachers interviewed for this study, because of a lack of formal requirement and guidance to use LtL supporting methods, they tend to act intuitively and on the basis of personal experience in different learning-related situations. Moreover, as data from other studies (Mickovska-Raleva, 2013) indicates the system conducts inconsistent expectations from teachers. On one side, the messages received by the BDE Advisors and the Educational Inspection are in direction of using student-centered learning methods, developing higher cognitive skills; while on the other side – the external assessment tested students with multiple-choice items, which evoked memorization. This leaves the decision on the frequency and level of use of instructional practice supporting LtL on the teacher and his/her personal motivation for continuous professional development. Therefore, they apply LtL supporting instruction in certain situations, mostly related to the affective dimension of the competence, but not in others, typically related to the cognitive dimension. This is why more than half of teachers were found to only partially support LtL competence through their instruction, i.e. while stimulating some of its aspects, they neglect others. The likely reason for this approach is the insufficient formal knowledge on the interaction between cognitive and affective domains of the student-learner and the insufficient analysis of what works in their classrooms when it comes to more effective

learning and creating self-directed learners. In addition, the insufficiently developed LtL competence within the majority of teachers likely leads to them not being competent enough to transfer the required skills to their students (Dembo, 2001).

There is a clear mismatch in the responses of teachers and students, when it comes to the instructional methods typically used in the classroom. Although a majority of teachers responded to use contemporary student-centered methods, on their own or in combination with the traditional approaches, students were especially critical of the instructional methods typically used by teachers and their teachers' impact in developing lasting knowledge, genuine interest in the subject matter and will for continuous learning. Students assessed the use of contemporary methods as more effective, especially the active interaction with the teacher where they have freedom to question the material without being judged or criticized; although they confirmed it occurs less frequently compared to the traditional approach. However, students feel lack of agency to make a change in the learning process by adjusting the methods or/and the contents to their needs.

Both teachers and students admitted that learning in the classroom is mainly driven by external stimuli (marks, rewards from parents) and that most of the contents are not perceived as relevant to students' lives and intrinsically stimulating. While teachers tend to perceive effort and persistence as important factor in achieving good outcomes in school and life, the majority of teachers lack the knowledge and skills how to utilize effort in order to achieve the learning goals. This leaves students on a half-way path in the development of the LtL competence. They receive messages that they should not give up and should try harder in order to achieve the tasks they are faced with, but are not provided with a diverse set of strategies (cognitive, meta-cognitive and affective) how to do that.

In order to address some of these issues, the following recommendations are provided:

POLICY LEVEL

The concept of LtL, although mentioned in certain national policy documents, is not systematically included as part of the policy agenda. Hence it is not recognized as important competence to be gained at the end of primary school. Therefore, it is recommended for:

- Learning to Learn competence to be clearly included in main national policy documents (Laws on primary and secondary education, Strategy for Development of Education) as one of the goals of the education/schooling process. These would enable the competence to be incorporated in the curricula through the learning goals/expected outcomes of the learning process (e.g. 'students should acquire skills for self-guided learning').
- In addition, in order to be able to systematically follow the attainment of the competence (through its integral parts), assessment guidelines should be developed and achievement standards should be incorporated in curricula.
- The system for teacher monitoring should be consistent. Bureau for Development of Education advisers, Educational Inspectors, in-school teacher appraisal) should be guided by the same principles, and the development of LtL competencies within students should be part of this system.

- Awareness should be raised among the expert public (education policy makers, teachers, school management) and among parents on the importance of LtL competence.
- The aspects of LtL competence encompassed within international assessments should be popularized and translated within the national assessment system (which is to be developed).
- Central-level institutions, such as the Ministry of Education and Science, the Bureau for Development of Education should host web pages for exchange of good practices among teachers. In addition, they can engage in development of teachers' guide encompassing effective strategies for developing different dimensions of the LtL construct (e.g., meta-cognitive strategies, instructional approaches for developing critical thinking, directions on providing feedback to students, etc).

PRE-SERVICE TEACHER EDUCATION

Teachers haven't had sufficient training to understand the significance of LtL, its composing aspects and their interrelation. Hence they act intuitively and often inconsistently in situations which provide opportunities for addressing the competence. Future teachers would benefit from:

- Learning instructional practices which stimulate LtL in a consistent manner, i.e. through acknowledging the interaction of the different personality domains for creating effective learners. In this regard, cognitive psychology principles for effective learning which take into account the whole personality should be a requirement for prospective teachers.
- However, as research shows, it is not sufficient for pre-service teachers to know the principles, but they need to be able to apply them in their own learning (by experiential learning during the pre-service training) in order to be able to successfully transfer them in their pre-service practice and in their teaching practice latter on.

IN-SERVICE TEACHER EDUCATION

Data from this study indicate that certain types and forms of in-service continuous education are linked to teachers' more frequent use of LtL stimulating methods. Teachers also confirm that they need additional training/instruction for applying such methods. Therefore, it is recommended to:

- Develop an in-service training curriculum on methods for supporting LtL (or self-directed learning). It could incorporate certain contents from the trainings found to be related to more frequent use of such method, but focus on addressing all aspects of the construct as a whole.

- Build a collegial support-system for teachers to be able to exchange experience with regards to effective methods of teaching, learning and assessment of LtL-related skills. Schools and teachers should be supported in conducting action research focused on developing LtL competence.

WAY FORWARD

1. Addressing methodological issues

- The study was primarily exploratory and included designing new instruments/questionnaires to enable in-depth analysis of the issue. During the initial phase of instrument design, it was considered critical to elicit responses which would resemble teachers' actual classroom practices. Hence the decision to use teacher questionnaire based on open-ended vignettes with hypothetical situations. Although multiple choice questions would have yielded more exact data, they represent a threat for providing socially (i.e. educationally) desirable responses by teachers. The open-ended questions reduce this threat, although teachers nevertheless have a tendency to present their practices in a socially desirable light, and provide responses which are in line with the contemporary educational requirements. Therefore, it is expected that the responses provided are still skewed towards more favorable instructional methods and towards 'ideal' reactions instead of actual. This is confirmed by responses of students, according to which the methods and reactions described by their teachers are rather rare.
- In addition, the process of coding and scoring the open-ended responses was open to interpretations. This threat was reduced by engaging three independent reviewers, and afterwards-fine tuning the item scores in case of low inter-rater reliability. In this way, the lead researcher was engaged in developing the coding scheme (assessment rubrics), and in fine-tuning the final scores in line with the theoretical framework; while the actual scoring was left to the reviewers in order to reduce the subjectivity in scoring and reduce the 'expectations threat' on behalf of the lead researcher.
- Bearing in mind these methodological issues, the topic should be further explored by the academia. In particular- the instruments for assessing the instructional methods used should be further developed, validated and possibly standardized. In addition, the level of development of LtL competence within students should be assessed based on adaptation of the instruments used in other countries.

2. Informing policy making

- The policy makers should analyse how the findings from this and related studies can be used to support the education and labor market policies and achieve the goal of improving the employability skills of the Macedonian citizens.

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Annex 1: Research Instruments

Questionnaire for teachers

Dear teachers, the following statements describe everyday examples of pupils' performance and learning. Please read each one carefully and indicate how you would respond should such a situation occur in your school. If you have experienced such an event in your practice, please try to recall the way you reacted then. If you have not had a similar experience, then try to imagine the way you would most probably react. There are no right or wrong answers, we are only interested in your honest opinions.

Note: It is important for us to receive diverse responses which would be used for presenting and promoting good practices within Macedonia, but also outside the country.

1. A child in one of the classes you teach is of average ability and achievement for his age. You have noticed that recently he has begun working much harder compared with the rest of your pupils. He pays attention during the lessons, shows interest in the subject, and finishes all assignments on time. Do you believe it is possible for him to achieve the highest grades in his class within the next 2 years if he continues to work at this level?

(please circle the answer which best reflects your preferred choice)

Yes No

2. Two pupils in your class are performing at approximately equivalent levels on their schoolwork. However, pupil A, whom you judge to be very bright, is not working very hard. On the other hand, pupil B whilst not so capable, works very hard. Which pupil do you think is likely to be the most successful provided they both develop in similar conditions?

- by the end of secondary school?

Pupil A __ Pupil B __

- in the longer term?

Pupil A __ Pupil B __

3. You have a **new curricular unit** to present in your class. The pupils have only basic knowledge on the topic. **Describe how you would proceed with the lesson.** (It is not expected to provide detailed description of the lesson, but only state the methods, techniques and forms of teaching and learning).

Name/topic of the unit:

Beginning of class:

Main part of class:

Ending of class:

Among the methods you described above, which one do you feel is most effective:

How frequently do you use that method?

1	2	3	4	5
Very rarely				Everyday

4. Part of the students in a class have **difficulties understanding the material as a result of the problems in understanding certain terminology**. You want to **help them understand better**. How would you do that? If you have faced a similar situation in your practice, note the specific case.

5. Some students in the class think that they know a certain content which you are covering during a lesson from their everyday life, and do not pay enough attention during the class. You notice that they have big misconceptions about the topic. **What would you do to point out their misconceptions and regain their interest?**

6. You give your students to learn part of the material on their own, wanting to develop a habit for individual learning. **Do you provide them with directions on how to organize their learning, or you don't direct them?**

If you do direct them, what do you suggest to them?

What types of questions do you pose to discover how they learned?

How do you check what they have learned after the learning?

7. After a completed written assignment, few students complain on the grades received. You are aware that they haven't understood the matter, since they did not learn in the right way, i.e. they relied on 'rote learning'. **What do you suggest to them how to learn in future?**

8. Student A. frequently re-examines what you present during the lessons, criticizes the textbooks and has her point of view on things. On one written assignment, she reacts that the **questions are not posed well, and they have dual meaning. How do you react to this behavior?**

9. Student R. is very active during your lessons; he keeps asking questions and answering your questions. However, his responses are sometimes unusual and do not fit into what you would expect to hear.

How do you react when he provides a response that is unexpected (not correct, but not completely incorrect)?

10. Your colleague confides to you that she is not sure how to motivate students to discuss more during classes. She says that when she poses a question, students usually respond with yes-no or short responses, but there is no active exchange of opinions. **What would you suggest to her to change this?**

11. A new student has joined one of the classes you teach. You don't know how capable he is of completing the schoolwork required, but in your lessons he doesn't do any of the assignments. When you give him a task or ask him a question, he doesn't even attempt to do it or give an answer. When you ask him why he doesn't try, he says **he is just not good at your subject. How would you respond to his comment?**

12. A pupil had been performing well in your subject until she received a low mark for a piece of work. Since then, any time she is faced with a more challenging task, she gives up saying she isn't clever enough to complete it. **What sort of tasks would you give her in order to raise her performance?**

13. Pupil Y has been working very hard at your lessons. He always does his homework, finishes all of the assignments given, shows interest in the subject and asks questions. However, during the first term, his work was never assessed higher than grade C. Still, he doesn't give up and is determined to improve the mark. At the beginning of the second term, **he asks you what he should do in order to improve his achievement. What do you tell him?**

15. You notice that students X and Y are talking while you are lecturing. By doing this, they disrupt the lesson. You approach them and understand that they discuss about the topic you are covering. **What is your reaction?**

Please respond to the demographic and general questions below

1. Gender

A. female

6. male

2. Age

A.22-34

6. 35-49

B.50+

3. Education attained (educational degree, Faculty/University):

.....

4. Subject/s you teach:.....

5. Years of experience as a teacher:.....

6. Have you attended some of the below stated trainings/workshops during the past 10 years?

If you have, please circle the number in front of the ones you have attended and write how many days they lasted.

In addition, mark the extent you consider what you have learned as useful in your everyday practice (1- completely useless, 5 - completely useful).

If you have visited additional trainings/workshops, which are not stated in the table, please write them down in the empty fields.

Name/topic of training/workshop	Level of use
	(1-5)

1. PEP project: Improving school-based assessment (Formative assessment)	
2. PEP project: Improving mathematics and natural science education	
3. PEP project: ICT in education	
4. Education modernization (World Bank)	
5. Mathematics and language literacy (UNICEF)	
6. Inclusive education (UNICEF)	
7. Self-directed learning (World Bank)	
8.	
9.	
10.	

7. Please mark your level of satisfaction with the below stated aspects of your work.

How satisfied are you with the cooperation with your colleague teachers in the school? (please circle)			
1 Highly unsatisfied	2 Moderately unsatisfied	3 Moderately satisfied	4 Highly satisfied
How satisfied are you with the cooperation with the support staff in the school? (please circle)			
1 Highly unsatisfied	2 Moderately unsatisfied	3 Moderately satisfied	4 Highly satisfied
How satisfied are you with the cooperation with the school management? (please circle)			
1 Highly unsatisfied	2 Moderately unsatisfied	3 Moderately satisfied	4 Highly satisfied
How satisfied are you with your profession as a teacher? (please circle)			
1 Highly unsatisfied	2 Moderately unsatisfied	3 Moderately satisfied	4 Highly satisfied

9. If you have an opportunity to start a new career, would you choose to be a teacher again?(please circle)

- a. Very likely Yes b. Probably yes c. Probably no d. Very likely No

.....

Would you accept to be interviewed with regards to the topics covered in this questionnaire? (please circle)

Yes

No

If you answered – Yes, please leave your telephone number for us to contact you.

.....

Thank you for your time!

Individual Interview Guide for Teachers-

1. What do you think is most important to develop within your students?

Probe: What type/s of knowledge, skills, competencies?

2. What is your opinion, how influential is the teacher in forming the students' personality?

3. What do you think best **motivates students for learning**?

- Probe: How motivating are the grades?
- Probe: The future career/enrollment into secondary school, university?
- Probe: The satisfaction from the learning/acquiring new understanding?

4. If you hear someone say that a **student knows how to learn**, what does it mean to you?

5. What do you understand under – **problem solving ability/competence** within students? What should a student know/be able to do so you would say s/he has a highly developed problem-solving ability?

Probes: (What types of activities can support the development of this competence? How can you recognize if students have developed this competence? Assess the level of development? What problems do you face when trying to develop this competence?)

6. What do you understand under – **creative thinking ability/competence** within students? What should a student know/be able to do in order for you to say that s/he has highly developed creative thinking competence? Do you think that all students are able to think creatively? If you hear that a student is creative, what does it mean to you? Some teachers consider that these students are problematic at school. What is your opinion?

Probes: (What types of activities can support the development of this competence? How can you recognize if students have developed this competence? Assess the level of development? What problems do you face when trying to develop this competence?)

7. What do you understand under – **lifelong learning competence** within students? What do you think are the best ways to develop this competence within students? How big of a factor is the teacher?

8. How much do you think that the **perseverance (in learning)** is an important aspect of the school success? Is it more or less important than intelligence? According to you, which student would be more successful in life, the one that is persistent, or the one that is intelligent? Why?

9. What is your opinion - How important it is that students are **aware of the way in which they learn/acquire knowledge and skills/arrive at solutions**? Why yes/no? How much do you focus on the process of learning during the classes? Which methods do you use to assess the manners in which students learn and use this to improve their learning?

Focus Group Guide for Students

Ice-breaking activity for getting to know the students and relaxing the atmosphere

1. Which **class/subject** is the **most interesting** to you? Why?

Probes: What do you do at the class? How does the teacher teach? What do you (the students) do? Are you allowed to ask questions? How does the teacher respond to the questions? How motivated/interested are you to continue learning at home?

2. Which **class/subject** is the **most boring** to you? Why?

Probes: What do you do at the class? How does the teacher teach? What do you (the students) do? Are you allowed to ask questions? How does the teacher respond to the questions? How motivated/interested are you to continue learning at home?

3. Describe how often you have an opportunity to **work independently** during classes?

Probes: Do teachers provide you with guidelines how to work/learn or leave you alone? How do they check what you have learnt?

4. Describe how often you have an opportunity to **work in small groups** during classes?

Probes: Do teachers provide you with guidelines how to work/learn or leave you alone? How do they check what you have learnt?

5. Describe how often you have an opportunity to **choose what you would like to learn/** learn in more depth?

Probe: example. There is some topic that interests you a lot and you would like to learn more things about it. How encouraging are teachers in letting you do that? Providing you with materials/directions?)

6. Describe a time when...:

- The teacher **poses a problem** which you need to solve/discuss about it? Would you like this to happen more frequently? Why yes/no?
- The teacher **presents you with contradictory ideas** and says you should represent one of them/discuss about them? Would you like this to happen more frequently? Why yes/no?

- The teacher gives you a **topic/problem to research/explore**? Would you like this to happen more frequently? Why yes/no?

How frequently do following events happen during classes

6. **How do you usually study/learn best?**

Probes: In school? At home? Describe the process? How do you know that you have learned something?

8. What do you learn with **the greatest interest**? What with the **least interest**? Why?

9. Did it happen that something you've learned in school interested you so much, that you've continued to read, search the topic? What was it? Why did it raise your interest?

Describe a time when the topic interested you so much that you pursued your own learning." Probes can then be "what did you do?" "What was the result?"s

10. How much what you learn in school, do you think will be **useful in your life**?

Probes: What would be most useful? What less useful?

Annex 2. Classification of qualitative responses by categories

Question no.	Categories of responses
General categories	1-does not use LtL supporting techniques 2- partially uses LtL supporting techniques 3- fully uses LtL supporting techniques (if the response contains more categories, it is categorized according to the one on the highest level)
3	1. Uses traditional methods which do not require activity from students 2. Combines traditional and interactive methods 3. Uses interactive student-centered methods which require activity, critical thinking, problem solving, application of knowledge
4	1. Explains through familiar/simpler terms 2. Explains through connecting with real life 3. Explains and requires application of the term/concept; Enables students to research on their own and reach conclusions
5	1. Gives everyday examples, animations, etc. 2. Opens a discussion on the topic 3. Puts students in a cognitive conflict, to they come to a conclusion they don't know; Requires practical application of knowledge (through simulation, role play); Requires students to research the topic on their own
6	1. Does not provide direction to the student 2. Provides general directions (eg. To study with understanding, asks questions related to the material) 3. Provides specific directions (eg. To focus on something they are interested in, to separate important from unimportant information, to self-question while learning)
7	1. Does not provide direction to the student 2. Provides general directions (eg. To study with understanding, continuously, to relate with everyday life) 3. Provides specific directions (eg. To focus on something they are interested in, offers learning strategies, requires from students to question him/her, to use additional resources)
8	1. Does not accept the student's opinion, maintains that the questions are well posed / the teacher is correct 2. Explains what the question specifically requires, reformulates the question 3. Asks which part/aspect of the question is unclear, allows reformulating from the students
9	1. Tells the student not to interfere with the work of teacher, does not accept the opinion 2. Hears the student out, but does not accept his opinion

	3. Hears the student out, accepts the different opinion and requires from him to explain it
10	<ol style="list-style-type: none"> 1. Does not offer advice to the colleague 2. Advises the colleague to be more creative, to use examples, ICT, ask more specific questions 3. Advises the colleague to use activities which stimulate cognitive activity on behalf of students (debates/discussions, quizzes, problem situations, questions requiring in-depth responses), to not criticize for a given response
11	<ol style="list-style-type: none"> 1. Does not respond / or provides general responses (to be more attentive, to perform his/her duties, assures him his perceptions are wrong and he is clever) 2. Responds that he should try harder, to be persistent, asks simpler questions to increase his self-confidence 3. Discusses about the specific difficulties, offers ways in which he could assist in learning (through increasing interest, offering learning strategies, asking questions, etc.)
12	<ol style="list-style-type: none"> 1. Tells the student he is clever enough, points out previous achievements, motivates him with increased grade for effort 2. Points out the importance of effort/not giving up, praises him when he does something well, discusses, offers additional (make-up) lessons 3. Gradually increases the difficulty of assignments/requests, provides specific assistance in mastering the contents (directs the approaches, methods, strategies), encourages questioning
13	<ol style="list-style-type: none"> 1. Directs the student to continue learning the same way 2. Advises the student to continue learning, to come to additional lessons, to invest more effort 3. Supports the student and directs her how to study, explains to her the criteria for a higher mark
14	<ol style="list-style-type: none"> 1. Tells students to be quiet and listen to the teacher 2. Tells students to listen first, and then ask, discuss 3. Encourages students to discuss loudly and publically