Paper Title: The Connection Between Teachers' Reflection and Formative Assessment in Primary Schools

Type of the research: "Research article"

Authors:

Author 1 : Vjollca Ahmedi, University of Pristina, Kosova, vjollca.ahmeti@uni-pr.edu

Corresponding Author: Blerta Mehmetaj, Ss. Cyril and Methodius University of Skopje

bblerta.mehmetaj@hotmail.com

The date of completion of the document and its publication: December 15, 2023

Abstract: The rapid reforms that the education system in Kosovo has witnessed over the last decade are constantly challenging teachers and the teaching process. It is important for local institutions to gauge the success of different teaching practices to approve replication.

Reflection is an integral part of learning and education as a whole. A highly reflective teacher believes that, through formative assessment and motivation techniques, all students will stay focused on learning. To explore the interplay between reflection and the use or lack of use of formative assessment by teachers, a two-way analysis using a t-test and a Levene's test for homogeneity of variance in teachers was performed depending on their general ability to reflect or not.

The result of the t-test for the differences between teachers who used formative assessment or did not use the same was found to be $t = 2.83$, while the result of sig (Statistical significance of the two-way) showed significant differences between groups, with $p = .007 < .05$.

Keywords: connection, formative assessment, reflection, teaching

Literature Review

Metacognitive Theory in Formative Assessment and its Relation to Reflection

Metacognition can be briefly defined as "the ability to think about thinking" (Musai, 1999, p.142). From this definition, "students who can think in such ways as the analysis of an experiment, to see what went wrong, show that they are learning from the past to prevent the same problems from happening in the future. Doing more than the same when it does not work is not metacognitive" (Burke, 2009, p. 107). Thus, metacognitivism essentially means knowledge about thinking (Musai, 1999). The term "metacognition" refers to a process of self-monitoring and general reflections on one's own thinking. Also, self-assessment is a key component of formative assessment, as students collaborate with teachers to develop a shared understanding of the current learning situation and identify how to move forward on their complex learning journey (Sadler, 1989). Thus, they are enabled to examine how learning is progressing throughout a lesson or a series of similar lessons, so that teaching and learning activities can be adapted as needed (R. Makkonen; K.Jaquet , 2020). Students need to reflect on their learning and this allows teachers to also reflect on what content students are dealing with. Thus, they then make the appropriate changes in the curriculum. Students learn better when they know exactly what is expected from them. By evaluating their learning by reflecting on their outcomes, and goals, they can improve on certain areas of the content that were taught, and learned. Through reflection, they can share their experiences, what they know about the subject, and what areas the teacher needs to support them (Muller, 2022)**.** Therefore, learners who think reflectively become aware and control their learning by actively accessing what they know, what they need to know and how to overcome that gap (Sezer, 2008) (Ch. Choy ; P. San Oo, 2012).

The metacognitive process includes the knowledge of cognitive and productive processes and the ability to control, monitor, and evaluate cognitive processes (Flavell, 1979). The metacognitive process involves four stages. The first stage involves task definition, wherein students define their task to study. The second phase involves goal setting and planning. It is no coincidence that success is planning. Planning is a process during which the planner predicts the stage of development of a phenomenon (Hyseni, Mita, Salihaj, & Pupovci, 2003). The third stage involves approval using strategies to meet those plans, whereas the fourth and final stage

involves adaptation, i.e., changes made to the learning process based on their experiences (Winne & Hadwin, 1998). Metacognitive knowledge and skills relate to self-knowledge as a student, strengths and weaknesses in learning, task knowledge, knowledge of different ways of learning, knowledge regarding how to solve a task, strategic knowledge when to use certain knowledge, how to plan learning, what to do when confronted with challenging situations.

Research has shown that individuals who are aware of how they learn, how they solve problems, and how they apply knowledge in new or unforeseen situations are more successful in learning. Therefore, the emphasis is laid on acquiring metacognitive knowledge and skills. By making students aware of the fact that they can think about their thinking, the teacher will, in turn, help them improve their cognitive behaviors as a result of better fulfillment of classroom activities. This ability becomes apparent when students and teachers make joint decisions (Musai, 1999).

A number of studies on reflective thinking are concerned with the metacognitive theory or teachers' self-reflection in the learning process or practices in teaching. Teachers also engage in metacognition by reflecting on their own thought processes. Therefore, engaging in metacognitive thinking can be regarded as an internal conversation or monitoring of one's understanding, predicting their performance, deciding what else they need to know, organizing and rearranging ideas, checking consistency between different pieces of information, and drawing analogies that help them advance their understanding (Earl, 2006).

Teachers play a pivotal role in the development of metacognitive skills, a process during which they can help by asking questions that encourage students to think and explain how they deduced conclusions and solutions to certain problems and how they can solve those problems differently and more effectively. Teachers support students to "think aloud," support them to learn from their own mistakes, teach students to use mental maps, use graphic organizers, diagrams, encourage students to think about where they can apply a certain strategy for solving problems, encourage students to think about the aids and obstacles in the learning process, encourage goal setting and planning how to learn, create situations, and give open tasks for the solution of which students themselves have to decide which procedural and declarative knowledge to use. Therefore formative assessment is key to metacognitive processes and influences the development of metacognitive skills (Musai, 1999).

Areas that examine the cognitive aspects of student learning have significant relevance to students' knowledge prior to entering their respective class, often suggesting that prior knowledge is essential to support new learning and facilitate the transformation of ongoing learning. However, formative assessment processes are directly related to teaching and learning strategies in addition to current student performance. Researchers have identified that students require support and argue that student involvement through a metacognitive approach is important in assessment (Pryor & Crossouard, 2008). The purpose of such a process is to encourage students and teachers to be open to new challenges in developing formative practices (Bangert-Drowns, Hurley, & Wilkinson, 2004).

Students are considered a subject and, thus, involved in the assessment process. They use the brain to reason (receiving feedback), the social circle to interact (assessing each other), and the metacognition (to accept their own knowledge). These interrelated entities help implement and cultivate the benefits of formative assessment.

Linking Formative Assessment to Reflection

Reflection is a process of critical analysis that entails both the cognitive element and the affective element, which ultimately impact the formative evaluation. Critical thinking is a process involving rational reflection that focuses on making decisions about what one will believe or do in advance (Musai, 1999). (Burke) 2009, suggested that students, collaborative groups, and teachers pay more attention to the process of refining what they have done and reflecting on their own learning. If students establish a connection between the previous lesson and the new lesson, they are more likely to understand and not forget what they have learned. The formative assessment focuses mainly on the personalized learning process rather than academic grades. It allows teachers to gather important information that helps them improve their teaching patterns in the future. Students will also understand their strengths and weaknesses, and that will empower them to become better learners (Gonsalo, 2022).

The concept of reflection originates from Dewey (1933), who defined it as the intentional and determined examination of beliefs, knowledge, and practice based on existing information and understanding and considered it an important educational goal. While some researchers view

reflection as challenging and that it reconstructs prior knowledge and conceptions, others relate it to the active and purposeful exploration of experiences (Chan & Lee, 2021) (L.Ketonen; J.H.Nieminen, 2023)**.**

The influence of a teacher is noticed in the development of reflective thinking. According to Earl L. M. (2013), when teachers focus on assessment as a lesson, they use assessment in the classroom as a tool to help students develop the practices required to become critical thinkers, by being satisfied with their learning. Instead of believing that learning is a process based on the transmission of knowledge by teachers, learning is now largely perceived as a process during which students actively build their knowledge and skills (de Corte, 1996).

There has been a joint effort between universities and higher learning institutions to include critical thinking in their curriculum. However, as evidenced by a number of studies (Choy & Cheah, 2009; Rudd, 2007; Black, 2005), students may not be able to think critically because their teachers are not able to integrate enough critical thinking into their daily practice, as it requires a certain amount of reflection. In addition, critical thinking is equated to Bloom's high-order thinking skills: analysis, synthesis, and evaluation (Bloom, 1976), and thus, teachers have difficulty incorporating these levels into their lessons (Choy & Cheah, 2009). Reflective thinking tries to improve critical thinking (Dewey, 1933). This is part of the critical thinking process that specifically refers to the process of analyzing and judging what has happened. Therefore, critical thinking encompasses a wide range of thinking skills and leads to desirable outcomes, whereas reflective thinking helps integrate these thinking skills, aiding in judgments (Shermis, 1999). An important role of reflective thinking is to act as a tool to motivate the “thinker” during problem-solving situations because it provides an opportunity to step back in order to think of the best strategies to achieve the goals (Rudd, 2007). Teachers who are able to use reflective practices will therefore be better able to use this strategy to help students think critically (Bigge & Shermis, 1999).

Reflective practices of teacher thinking, according to Boody (2008), in general, can be characterized as: retrospective, problem solving, critical analysis, and translating thoughts into action. Regarding reflective thinking, Boody (2008), mentioned the following characteristics: a) reflection as retrospective analysis, b) reflection as problem solving, c) critical self-reflection, and d) reflection on self-beliefs and self-efficacy. Teachers’ reflection is regarded as retrospective

analysis, i.e., the ability to self-assess. This approach is reflected as appropriate thoughts to include experiences in advance and how these experiences may affect current teacher practices. This retrospective analysis also includes the ability to self-assess. In summary, critical reflection can be viewed as the process of analyzing, reviewing, and questioning experiences within a broad context of issues such as ethical practices, learning theories, and the use of technology (Boody, 2008). Assumptions held by individuals are subject to distortions and may even limit their views of reality. Feelings and beliefs that teachers have about themselves and others affect how they teach others. These beliefs are more effective than knowledge in influencing how individuals organize tasks and problems and are better predictors of how teachers behave in a classroom (Pajares, 1992). In addition, self-efficacy also plays a central role in determining teachers' reflective practices.

Teachers with high self-efficacy believe that all students can be motivated and are willing to explore through tasks, which will direct their attention toward the learning process. A number of studies have underlined the fact that critical thinking is social in nature and requires reflection on the part of the student. However, it should also be noted that teachers who implement their reflective lessons also affect students' critical thinking skills.

Methodology

Aim

This study was conducted with the aim of establishing the relationship between formative assessment and the reflective approach of teachers and to present whether there are differences between teachers who use the reflective approach and formative assessment and those who do not.

Questions and hypotheses

Research question

1. Are there any differences between the reflective approach of teachers who use formative assessment and those who do not?

Hypothesis

1. Teachers who use formative assessment are more reflective professionally than those who do not use the same.

Research Design

A quantitative study was conducted where questionnaires that measure the implementation of formative assessment and reflection were distributed to 47 teachers. The values obtained were used to express frequency, differences and correlation.

According to the quantitative or structured approach of research everything that forms the research process – objectives, model, samples, questions that you plan to ask the respondents – is predetermined. The quantitative approach aims to determine the amount of change in a phenomenon; focuses on the measurement of variables and the objectivity of the process, as well

as analyzes the findings in an analytical and unified form, drawing conclusions and meanings that can be generalized (Kumar, 2017, p. 15).

Also, the correlation of certain variables was assessed to evaluate the impact of the implementation of formative assessment on teachers' reflection.

Study Population and Representative Group

This study targeted the population consisting of primary school teachers in Kosovo, from grades 1 to 5. The representative group of this research consists of 47 teachers (43 female and four male).

The first group included teachers who apply formative assessment and students on whom formative assessment is applied;

The second group included teachers who do not apply formative assessment and students on whom formative assessment is not applied.

Data collection tools

In this study, a Likert scale-based questionnaire named The Reflective Thinking Questionnaire was developed. This questionnaire was divided into two parts and consisted of 33 statements (questions). The first part included variables on demographic characteristics (age, gender, and teaching experience), while the second part consisted of four scales, 11 sub-scales, and 33 items that describe skills such as:

1. The ability for self-assessment – four subscales and 12 questions:

1.1. Personal performance is observed – three questions;

1.2. Use of feedback – three questions;

1.3. Findings and analysis of models – three questions;

1.4. Judgment – three questions.

2. Knowledge about how an individual learns – three subscales and nine questions:

2.1. Inaccurate concepts and ideas – three questions;

2.2. Knowledge building – three questions;

2.3. Metacognition – three questions.

3. Development of lifelong learning skills – three subscales and nine questions:

3.1. Identity development as a student – three questions;

3.2. Transfer of knowledge to other contexts – three questions;

3.3. Understanding learning as a lifelong process – three questions.

4. The impact of self-confidence and self-efficacy – one subscale and three questions:

4.1. Developing a personal trust system – three questions.

Five alternatives were used to study teachers' reflective thinking:

5: *completely agree*, 4: *agree, but have some doubts*, 3: *neutral to the statements*, 2: *disagree, but have some doubts*, 1: *completely disagree*.

Questionnaire on reflective thinking

- ***Cronbach's alpha model***

The results presented in Table 1 show that the measuring instrument that measured reflection fulfilled the most important condition for the application of the measuring instrument, namely, the reliability values of Cronbach's alpha (reliable; $\alpha = .733$).

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	Number of Items
.733	.732	24

Table 1. The reliability coefficients of the reflection ability instrument according to Cronbach's alpha

- ***Guttman model***

According to the Guttman model, the lowest reliability coefficient for the reflection ability fulfilled the most important condition for the application of the measuring instrument. Observed in terms of six calculated coefficients, the lowest value was found to be 0.687 lambda, while the highest value was 0.907 lambda. The results confirmed that the research instrument was reliable. Table 2 summarizes the results of the reliability test for the reflection ability instrument. Clearly, the instrument fulfilled the condition for application and can be considered reliable.

Reliability Statistics		
Lambda	1	.687
	2	.701
	3	.717
	4	.740
	5	.818
	6	.907
Number of Items		24

Table 2. The reliability coefficients of the reflection ability instrument according to Guttman model

Data Collection Procedure

Before distributing the structured questionnaire to the teachers, they were informed and received the necessary instructions on how to complete the questionnaire. The questionnaire for teachers, in addition to demographic data, contained 33 statements/questions, and completing these questionnaires took approximately 15 minutes.

The questions were first entered into the SPSS Data Analysis Software and then converted into relevant variables. In addition to the general data, the questions related to the issue were coded on a 5 -point Likert scale.

Results and Discussion

To test the study hypothesis, univariate data (averages and standard deviations) were first analyzed, including descriptive analysis (percentages/frequencies). Data analysis was done by using the formative assessment instrument, applied to teachers, as well as the reflection instrument, applied to the same sample. After obtaining the descriptive results on the variables of each instrument, they were analyzed, linking the answers from both instruments. To achieve this, first, the univariate analysis made it possible for teachers to be divided into two groups (those who use and those who do not use formative assessment). Thus, through bivariate analysis (with two variables; herein, formative assessment and reflection) of the t-test, a distinction was made between the group of teachers who use and do not use formative assessment and their respective level of professional reflection. The results are as follows:

Results of attitude and action toward formative evaluation and reflection

By investigating the attitudes of teachers toward formative assessment, the actions or activities they implement in relation to formative assessment, as well as reflection, it was noticed that, in general, they have a positive attitude and action toward formative assessment.

Total	*Completely negative*	*Partly negative*	*Neutral*	*Partly positive*	*Completely positive*
Attitude toward formative assessment	**1.7%**	**4.6%**	**5.1%**	**25.1%**	**63.5%**
Action toward formative assessment	**5.9%**	**3.7%**	**15.2%**	**35.2%**	**40%**
Reflection	**4.6%**	**8.8%**	**12.7%**	**29.6%**	**44.3%**
TOTAL	**4%**	**5.7%**	**11%**	**30%**	**49.3%**

Table 3. Results of attitude and action of teachers toward formative assessment and reflection

• Differences between the results of teachers who use and those who do not use formative assessment and the level of reflective thinking

To explore the interplay between reflection and the use or lack of use of formative assessment by teachers, a two-way analysis of t-test and Levene test on homogeneity of variance in teachers was performed depending on their general ability to reflect or not. The t-test for the differences between teachers who use formative assessment or not showed t = 2.83, the result of sig (Statistical significance of the two-way Anova), showed significant differences between groups, with p = .007 < .05.

The results of these two tests showed that the average of 23 participating teachers who apply formative assessment was Mean = 117.30 and Standard Deviation = 8.12, while the average score for teachers who do not apply formative assessment was M = 110.04 and DS = 9.39. Teachers who apply for formative assessment were noted to have higher reflective skills than teachers who do not apply formative assessment.

The analysis of the t-test confirmed the veracity of the study hypothesis, which asserted the existence of differences in the general ability for reflection between teachers who apply formative assessment and those who do not apply the same. Teachers who apply formative assessment were observed to have more pronounced reflective thinking than teachers who do not apply formative assessment.

Group statistics

	Groups based on usage of Formativ Assissment -FA	N	Mean	Std. Deviation	Std. Error Mean
Reflection	Group 1: Teachers who use FA	23	117.3043	8.12647	1.69449
	Group 2: Teachers who do not use FA	24	110.0417	9.39231	1.91720

Independent Samples Test

Reflection	Levene's Test for Equality of Variances		T-test for Equality of Means						
	F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper

Equal variance	.247	.622	2.830	45	.007	7.26268	2.56671	2.09306	12.43230
Unequal variance			2.838	44.549	.007	7.26268	2.55870	2.10776	12.41760

Table 4. T-test results related to the reflection of teachers who apply formative assessment and those who do not apply the same

Discussion

The study hypothesis was tested through the independent samples t-test, comparing the averages between the group of teachers who apply formative assessment and those who do not. The analysis of the results of the t-test confirmed the veracity of the hypothesis which asserted the existence of differences in the general ability for reflection between teachers who apply it and those who do not apply formative assessment. Teachers who apply formative assessment have more pronounced reflective thinking than teachers who do not apply the same**.** The obtained results showed that the average score of teachers who apply formative assessment is 23, while the average score for teachers who do not apply formative assessment is 24 and the significance value $p = .007$. These results confirm significant differences between the group of teachers who apply formative assessment and teachers who do not apply the same, in terms of professional reflection in a number of respects, as the difference in means between these two groups is conspicuous and $p < .05$. The difference between these two groups is a result of the application of many aspects of formative assessment, which affect the reflection in thought. Teachers' reflection, as a problem-solving process (awareness of how to learn), can be thought of as taking the necessary steps to analyze and articulate problems before taking action. For both students and teachers, the formative assessment process is a push toward reflecting on their work.

Formative assessment has a positive effect on students, cognitive and motivational skills. It enables both students and teachers to overcome their weaknesses and highlights their strengths. (S.Alabidi; A.Owais; F.Alabibi; O.Taani, 2022).

According to a research conducted by Nicholas Sun-Keung Pang, where 34 teachers participate, it turns out that reflection is a process where teachers are the main contributors who lead it. Throughout the reflective process, teachers are the leaders or guides for bringing students together to review teaching progress and learning content. (Pang, 2020).

According to Zeneli (2003), its main purpose is to ensure the pre-existing successes and failures of the student and the teacher. Thus, by applying this type of assessment, teachers reflect on the use of appropriate strategies and methods.

Bibliography

Bangert-Drowns, R. L., Hurley, M. M., & Wilkinson, B. (2004). (2004). The effects of school-based writing-to-learn interventions on academic achievement: A meta-analysis. *Review of Educational Research, 74*, 29-58.

Bigge, M., & Shermis, S. (1999). *Learning Theories for Teachers, 6th ed.* New York: Longman.

Black. (2005). Teaching Students to Think Critically. *The Education Digest*, 42-47.

Bloom, B. S. (1976). *Human characteristics and school learning.* New York: McGraw-Hill.

Boody, R. (2008). Teacher reflection as teacher change, and teacher change as moral response. *Education*, 498-506.

Burke, K. (2009). *How to assess authentic learning.* United Kingdom: Corwin.

Burke, K. (2009). *How to assess authentic learning.* United Kingdom: Corwin.

Ch. Choy ; P. San Oo. (2012). Reflective thinking and teaching practices: A precursor for incorporating critical thinking into the classroom. *International Journal of Instruction*, 167-182.

Choy, S. C., & Cheah, P. K. (2009). Teacher perceptions of critical thinking amongstudents and its influence on higher education. *International Journal of Teaching and Learning in Higher Education , 20*, 198– 206.

de Corte, E. (1996). Instructional psychology: Overview. In E. de Corte & E. Weinert (Eds.), International encyclopedia of developmental and instructional psychology. *Oxford: Elsevier Science*, 33-43.

Dewey, J. (1933). *How we think.* New York: Prometheus Books.

Earl, L. (2006). Rethinking Classroom Assessment with Purpose in Mind. *Teaching for effective learning*.

Earl, L. M. (2013). *Assessment as learning: Using classroom assessment to maximize student learning.* Thousand Oaks: Corwin.

Flavell, J. H. (1979). Metacognition and cognitive monitoring: A new area of cognitive-developmental inquiry. *American Psychologist, 34*, 906 – 911.

Gonsalo, J. (2022). 7 Key Benefits of Using Formative Assessment to Increase Student Growth. *ELOIT*.

Hyseni, H., Mita, N., Salihaj, J., & Pupovci, D. (2003). *Qeverisja dhe udhëheqja në Arsim Prishtinë:*. Prishtinë: Qendra për Arsimin e Kosovës.

Kumar, M. (2017). Research Methodology. *Premier University*.

L.Ketonen; J.H.Nieminen. (2023). Supporting student teachers' reflection through assessment: The case of reflective podcasts. *ELSEVIER*, Vol.124.

Muller, M. M. (2022). The importance of Formative Assessments for Teachers and Students. *Wissen finden publizieren*, 3-5.

Musai, B. (1999). *Psikologji edukimi, zhvillimi, të nxënit, mësimdhënia.* Tiranë: Pegi.

Pajares, M. (1992). Teachers' Beliefs and Educational Research: Cleaning Up a Messy Construct. *Review of Educational Research*, Vol.62, Iss.3, 307-332.

Pang, N. S.-K. (2020). Teacher's Reflective, Practices in Implementing, Assessment for Learning Skills in Classroom Teachin. *ECNU Review of Education*, Vol.5(3) 470-490.

Pryor, J., & Crossouard, B. (2008). A sociocultural theorisation of formative assessment. *Oxford Review of Education, 34*, 1–20.

Pryor, J., & Crossouard., B. (2008). A sociocultural theorisation of formative assessment. *Oxford Review of Education, 34*, 1–20.

R. Makkonen; K.Jaquet . (2020, November). The Association between Teachers' Use of Formative Assessment Practices and Students' Use of Self-Regulated Learning Strategies . *Institute of Education Sciences*, fv. 1-5.

Rudd, R. (2007). Defining Critical Thinking. Technigues . *Connecting Education and Careers, 87*, 46-49.

S.Alabidi; A.Owais; F.Alabibi; O.Taani. (2022). Exploring the Role of Reflective Diaries as a Formative Assessment Strategy in Promoting Self-Regulated Learning Among ESL Students. *Practical Assessment. Research and Evaluation*, fv. Vol.27, Article 19.

Sadler, D. (1989). Formative assessment and the design of instructional systems. *Instructional Science, 18*, 119-144.

Shermis, S. (1999). Reflective Thought, Critical Thinking. *ERIC Digest D143*.

Winne, P. H., & Hadwin, A. F. (1998). *Studying as self-regulated learning. In D. J. Hacker, J. Dunlosky, & A. C. Graesser (Eds.) Metacognition in educational theory and practice Mahwah.* New Jersey: Lawrence Erlbaum Associates.

Zeneli, I. (2003). *Bazat e standardizimit dhe vlerësimit në arsim.* Prishtinë: Libri shkollor.