



Teachers' Beliefs about Formative Assessment in the Pupil-Centered Curriculum

Petra Pejić Papak¹, Renata Čepić²

University of Rijeka, Faculty of Teacher Education in Rijeka, Croatia^{1,2}

Abstract

Formative assessment is an active process by which teachers regularly check their pupils' knowledge and understanding during classes and provide them with appropriate feedback. Teachers' competence to apply different forms of assessment to pupils' achievement influences pupils' motivation to learn and individual achievement [1]. Encouraging pupils to engage in self-assessment involves active engagement of the learning subject is crucial for the pupil to take responsibility for his/her learning [2, 3, 4]. This paper aims to examine teachers' attitudes about the use of formative assessment and to determine the link between teacher attitudes and the frequency with which pupils use forms of assessment and self-assessment in educational practice. For this purpose, the Scale of Teachers' Beliefs about the Application of Formative Assessment was constructed, whereby teachers assessed their degree of agreement with the items on a Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree). The research comprised a sample of 115 elementary school classroom teachers from 12 elementary schools in three counties of the Republic of Croatia. Assessment sheets (protocols) were used to gain a deeper insight into teachers' experiences in applying formative assessment and the collected data were processed through qualitative analysis. The results show that teachers emphasize the benefits of formative assessment, but at the same time do not feel fully competent to implement it, which affects the frequency with which various forms of formative assessment are applied. Most often, they use pupils' self-assessment and peer assessment. They outline different ways of performing formative assessment through thought-out tasks, using both digital tools as innovative and student-oriented ways to test the adoption of learning outcomes. Teachers cite lack of time as the most aggravating factor in the quality of formative assessment during the class. There is a need for further professional development in strengthening the competences for the implementation of various forms of student-centred assessment.

Keywords: curriculum, formative assessment, self-assessment, pupils, teachers.

1. Introduction

In contemporary educational contexts, the emphasis lies on the pupil-centered curriculum. Teachers are "responsible for many experiences that influence pupils' learning, and their beliefs directly affect the interpretation and importance they attach to their teaching experience" [5, p.134,135]. Teachers' beliefs largely determine their willingness to apply formative evaluation in educational practice. This implies strengthening the teachers' competence to apply different forms of evaluating pupils' achievements. Teachers' competences are understood as a complex combination of knowledge, skills, understanding, values, and attitudes, focused on quality action throughout the curriculum [3]. Verifying curriculum outcomes through a continuous active process implies formative evaluation. Therefore, teachers' beliefs about formative evaluation in the contemporary educational context are more than essential to the achievement of pupil-centered curricula, and this paper will rely on their empirical research.

2. Theoretical Background

A review of research on learning and teaching highlights three categories of experiences that influence beliefs and teacher knowledge: personal experiences, experiences based on formal knowledge that includes subject knowledge, attitude towards the learning content, and teaching methods, as well as school and classroom experiences, or all experiences that have shaped the idea of what teaching is and what the teacher's work includes [5]. Assessment is one of the important factors of continuous improvement of educational work. Beliefs influence the learning process and the change process they are involved in [6] and largely determine the teachers' willingness to apply formative assessment, provide feedback to pupils, and encourage pupils to engage in self-assessment in educational practice. The assessment accelerates progress because it sets clear learning goals [7]. Unlike summative assessment, which aims at an assessment of learning, formative assessment is assessment for learning aims to improve the learning process and learning outcomes of pupils with



different abilities and experiences. Formative assessment is an active process by which the teacher regularly checks the knowledge and understanding of his pupils during class and provides them with appropriate feedback [8]. The key strategies come from considering the three instructional processes [9], “where the learners go in their learning, where the learners are right now in their learning, and what needs to be done to get where they are going,” and three agents in the classroom, “teachers, the individual pupil, and peers.” In order for formative feedback to provide insight into the different components, it is necessary that the assessment is carried out in different contexts and that the teacher uses different forms and techniques of formative assessment in their work. The objective of formative assessment is to increase the pupils’ commitment to learning and self-assessment. With regards to the self-assessment process, pupils should be familiar with the learning outcomes and performance criteria [7]. A well-designed and conducted formative assessment should suggest to the teacher what the pupils know and can do [10]. Precisely self-assessment is an important component of formative assessment that strengthens pupil-teacher collaboration in the joint process of learning and teaching and contributes to creating a comfortable classroom environment that encourages collaboration and achievement of the pupil-centered curriculum outcomes. The main objective of this research was to examine teachers’ beliefs about the use of formative assessment in educational practice. The study focuses on the following three research questions: (1) to examine teachers’ beliefs about the use of formative assessment in the educational process; (2) to examine the frequency of using forms of assessment and pupil’ self-assessment in educational practice; (3) to examine the relationship between teachers’ beliefs about the use of formative assessment and the frequency of assessment and pupils’ self-assessment in educational practice with regards to their work experience and class being taught. Finally, a qualitative thematic analysis of the assessment sheets (protocols) provides a brief overview of teachers’ experiences in applying formative assessment in their teaching.

3. Method

Participants

The survey involved 115 classroom teachers from 12 elementary schools in three counties of the Republic of Croatia. Of the total number of participants, 112 (97.4%) were female and three were male (2.3%). The age of the participants ranged from 24 to 66 years and the average age of the participants was 46 years (SD = 8.024). The number of teachers included in the survey with respect to the teaching grade is as follows: first-grade (N = 30, 26.1%), second-grade (N = 24, 20.9%), third-grader (N = 32, 27.8 %), and fourth-grade teachers (N = 29, 25.2%).

Instruments

For the purposes of this research, a questionnaire was developed for classroom teachers on the application of formative assessment in educational practice and two scales were applied: “Scale of Teachers’ Beliefs about the Application of Formative Assessment”, which, after conducting a factor analysis, counts five items, examined teachers’ beliefs about the use of formative assessment in educational practice (the factor extracted explains 48.40% of the variance), and second scale, “Scale of Assessment and Self-Assessment Frequency”, comprising seven items, examined how often teachers use forms of assessment and self-assessment in educational practice (the extracted factor explains 56.46% of the variance). Assessment sheets (protocols) were used to gain a more complete insight into teachers’ experiences in applying formative assessment.

Procedure and data analysis

The research was conducted in 2019 among classroom teachers in a total of 12 elementary schools in three counties in the Republic of Croatia, selected by the random selection method. The obtained research results were analyzed with the statistical software SPSS 22.0 program. To examine the metrical characteristics of the Scale of Teachers’ Beliefs about the Application of Formative Assessment, we conducted a reliability analysis and exploratory factor analysis using the main component method with oblimin rotation. The Pearson correlation analysis examined the relationship between teachers’ beliefs about the use of formative assessment and their frequency of using forms of assessment and self-assessment in practice with regards to years of work experience. One-way analyses of variance examined differences in the mean score on the Scale of Teachers’ Beliefs about the Application of Formative Assessment and the Scale of Assessment and Self-Assessment Frequency with regards to the class being taught. Assessment sheets (protocols) that outline teachers’ experiences of applying formative assessment were addressed through a qualitative analysis.



4. Results and discussion

Teachers' Beliefs about the Application of Formative Assessment

The one-factor solution was tested using the principal components method. The factor extracted explains 48.40% of the variance. From the results shown in Table 1, it is evident that all item correlations with the total result are sufficiently high ($> .40$).

Table 1. Descriptive data for individual items on the Scale of Teachers' Beliefs about the Application of Formative Assessment

	M	SD	r_{it}
Formative assessment is worth my effort.	3.97	0.74	0.44
I have the necessary supporting materials to apply formative assessment.	3.60	0.90	0.68
Formative assessment makes my teaching easier	3.65	0.80	0.75
I have sufficient time to apply formative assessment.	3.09	0.94	0.57
I possess the necessary knowledge and skills to apply formative assessment.	3.75	0.88	0.60

Legend: arithmetic mean – M, standard deviation – SD, total score on the Scale (r_{it})

The results on the Scale of Teachers' Beliefs about the Application of Formative Assessment clearly indicate the teachers' belief that "Formative assessment is worth my effort" ($M = 3.97$). The qualitative analysis conducted and the teachers' experience in applying formative assessment in their teaching points to teachers' positive beliefs about formative assessment as well as teachers' efforts to put this form of assessment into practice. For example, one of the participants of the conducted qualitative research highlights that "Formative assessment is very welcome. I try to keep track of the student's efforts to achieve knowledge" (participant 15). At the same time, the results of the descriptive analysis show a positive belief "I possess the necessary knowledge and skills to apply formative assessment." ($M = 3.75$), while the qualitative analysis reveals that teachers interpret the term "formative behavior" differently – they identify it with notes monitoring pupils' work. It is significant to establish the understanding of the term formative assessment given the teachers' high self-assessments in the possession of the necessary knowledge and skills to apply formative assessment. The lowest belief is expressed in the item "I have sufficient time to apply formative assessment" ($M = 3.09$). Vingsle [11] highlights the complexity of formative assessment practice. She concludes that there is a lack of self-criticism in the assessment of one's own knowledge of formative assessment and a necessary assumption of responsibility for the correct application of formative assessment, whereby the aggravating circumstance certainly lies in the lack of experience in its implementation. The reliability coefficient of internal consistency Cronbach alpha (.81) indicates the Scale's good internal consistency. All items are formulated in the same direction, so that a higher score indicates more positive beliefs about the use of formative assessment. The theoretical range of scores on Scale extends from 2 to 5. The result of the Shapiro-Wilk test examining distribution normality ($S-W = 0.98$, $p > .05$) indicates that the variable was normally distributed. The arithmetic mean score ($M = 3.63$) indicates moderately positive teachers' beliefs about the use of formative assessment.

Frequency of assessment and self-assessment

The one-factor solution was tested using the principal components method. The extracted factor explains 56.46% of the variance. It is evident from the results (Table 2) that all the correlations of the items with the total result are sufficiently high ($> .40$).

Table 2. Descriptive data for individual items on the Scale of Assessment and Self-Assessment Frequency

	M	SD	r_{it}
Formative assessment as one form of assessment	3.70	0.76	0.48
Tasks to perform formative assessment that you designed yourself	3.36	0.84	0.57
Diagnostic questionnaires (check-lists and rating scales)	2.94	1.04	0.65
Opportunity for pupils to self-assess their work	3.73	0.80	0.68



Opportunity for pupils to assess the work of other pupils	3.71	0.88	0.65
Opportunity for pupils to assess your work	3.18	0.99	0.72
Self-assessment lists	2.91	0.99	0.77

Legend: arithmetic mean – M, standard deviation – SD, total score on the Scale (r_{it})

It is observable (Table 2) that the teachers agree to the greatest extent that in their educational practice they provide “Opportunity for pupils to self-assess their work” ($M = 3.73$) and “Opportunity for pupils to assess the work of other pupils” ($M = 3.71$). Encouraging pupils to engage in self-assessment involves the activity of the learning subject, aimed at assessing the level of achievement of teaching objectives [4] and is crucial for the pupil to take responsibility for their learning [2, 3]. This indicates that pupils are active participants in the teaching process, but it remains an open question whether pupils formulate feedback on their self-assessment and assessment of other pupils clearly and how the teacher uses the pupils’ feedback to improve the process. Self-assessment and peer assessment should not be an end in itself, but the teacher should be given the opportunity to influence their future guidance based on the feedback provided by the pupil. The reliability coefficient of internal consistency Cronbach alpha (.87) indicates a high internal consistency of the scale. All statements are formulated in the same direction, in such a way that a higher score indicates a higher frequency of using assessment and self-assessment in practice. The theoretical range of scores on the scale extends from 1 to 5. According to the result of the Shapiro-Wilk test ($S-W = 0.98$, $p > .05$), the variable was normally distributed. The arithmetic mean score on the Scale ($M = 3.36$) indicates a moderate frequency of using assessment and self-assessment in practice.

Relationship between teachers’ beliefs about the use of formative assessment and the frequency of using assessment and self-assessment with regards to work experience and class being taught

Pearson’s correlation coefficient examined the association between teachers’ beliefs about the use of formative assessment and the frequency of using forms of assessment and self- assessment in practice. The correlation coefficient obtained ($r = .42$, $p < .01$) indicates a positive correlation between the scores on the two Scales. Teachers with more positive beliefs about the use of formative assessment are more likely to use assessment and self- assessment in practice and vice versa (those with more negative beliefs are less likely to use assessment and self- assessment in practice).

Pearson’s correlation coefficients between teachers’ work experience and their score on the ale of the Scale of Beliefs about the Application of Formative Assessment and the Scale of Assessment and Self-Assessment was calculated. No significant correlations were obtained for the Scale of Beliefs about the Application of Formative Assessment ($r = .03$) and the Scale of Assessment and Self-Assessment ($r = 0.9$). One-way analyses of the variance examined differences in the average score on the Scales with respect to the grade being taught. No statistically significant differences were obtained on the Scale of Teachers’ Beliefs about the Application of Formative Assessment ($F_{(3, 110)} = 1.05$; $p > .05$), nor on the Scale of Assessment and Self-Assessment with regards to the class being taught ($F_{(3, 111)} = 0.85$; $p > .05$).

Teachers’ experiences of applying formative assessment

Teachers’ experiences of applying formative assessment, obtained through assessment sheets and covered by qualitative thematic analysis, will only be briefly presented due to space restrictions. Teachers emphasize the importance and usefulness of applying formative assessment and support its implementation (“I find this type of assessment excellent and most objective” (participant 1); “Formative assessment is useful for the teacher to gain insight into pupils’ chronological progress and acquisition of knowledge” (participant 20)). In applying the various forms of formative assessment, in practice, pupils’ oral and written feedback as well as self-assessment and peer assessment are used, including digital tools (“I use formative assessment sheets and self-assessment cards and peer assessment” (participant 19); “I use different digital assessment tools like *Kahoot*” (participant 9)). They emphasize that the lack of time, but also insufficient competence, is an aggravating factor for the effective implementation of formative assessment, and they emphasize the importance of continuous education (“Formative assessment requires from the teacher additioanl time, effort, and preparation, as well as assessment knowledge” (participant 12); “I am still in search of a good strategy for implementing this assessment method” (participant 16)).



6. Conclusion

Based on the empirical research, it may be concluded that teachers have moderately positive beliefs about the use of formative assessment and a moderate frequency of using assessment and self-assessment in educational practice. Teachers who have more positive beliefs about the use of formative assessment are more likely to use assessment and self-assessment in practice, and vice versa; those with more negative beliefs are less likely to use assessment and self-assessment in practice. No significant correlations were found between teachers' work experience and their beliefs about the use of formative assessment and the frequency of using forms of assessment and self-assessment in practice, or with regards to the grade being taught. Teachers' experiences obtained through assessment sheets show how teachers apply different forms of formative assessment in their educational practice, using digital tools as an innovative way of verifying the adoption of outcomes. The greatest aggravating factor for the quality of formative assessment during teaching is the lack of time. A teachers' beliefs directly affect the interpretation and importance which teachers attach to their experience of assessment. Therefore, in the initial and professional education of teachers, emphasis should be placed on enhancing teachers' competences to carry out different forms of assessment.

Acknowledgments

The publication is supported through the project "*Professional development needs, conditions, and learning opportunities of student-teachers and in-service teachers*" (uniri-pr-drustv-19-13), which is supported by the University of Rijeka, Croatia.

References

- [1] Pejić Papak, P., Vujičić, L. & Arrigoni, J. „Teachers' Views on the Development of Personal Competences and Pupil Competences: Croatian Experiences“, *Journal of Education & Social Policy*, 22 (1), 2015, 20-29.
- [2] Ilić, V. i Šiki-Erski, A. “Osnove suvremenog sistema kompleksnog vrednovanja rada učenika” [Foundations of the modern system of complex student work assessment], *Znanje* (1), 2018, 159-167.
- [3] Kalin, J. & Čepić, R. (Ed.) “Poklicni razvoj učiteljev: Ugled in transverzalne kompetence /Teachers' professional development: Status and transversal competencies”, Ljubljana, Rijeka, Znanstvena založba Filozofske fakultete Univerze v Ljubljani (Ljubljana University Press, Faculty of Arts), Učiteljski fakultet Sveučilišta u Rijeci (Faculty of Teacher Education, University of Rijeka), 2019.
- [4] Bursać, L., Dadić, J. & Kisovar-Ivanda, T. “Učeničkim samovrednovanjem do kvalitetnih učeničkih postignuća” [From student self-assessment to quality student achievement], *Magistra ladertina*, 11(1), 2016, 73-88.
- [5] Čepić, R. Kalin, J. & Šteh, B. “Teachers' profesional development: Context, perspectives , and challenges”, In:Kalin, J. & Čepić, R. (Eds.) “Poklicni razvoj učiteljev: Ugled in transverzalne kompetence /Teachers' professional development: Status and transversal competencies”, Ljubljana, Rijeka, Znanstvena založba Filozofske fakultete Univerze v Ljubljani (Ljubljana University Press, Faculty of Arts), Učiteljski fakultet Sveučilišta u Rijeci (Faculty of Teacher Education, University of Rijeka), 2019, 133-158.
- [6] Marcelo, C. (). “Professional Development of Teachers: past and future”, *Sísifo, Educational Science Journal* (08), 2009,5–20. (http://www.azoo.hr/images/stories/dokumenti/C_Marcelo_Professional_Development_Teachers.pdf, 5.5. 2016.)
- [7] Glazzard, J., Denby, N. & Price, J. *Kako poučavati: priručnik za odgojitelje, učitelje i nastavnike* [How to teach: A handbook for preschool teachers, teachers, and educators], Zagreb, Educa, 2016.
- [8] Bezinović, P., Marušić, I., Ristić Dedić, Z. “Opažanje i unapređivanje školske nastave” [Monitoring and improving school teaching], Zagreb, Agencija za odgoj i obrazovanje, 2012.
- [9] Andersson C. & Palm T. “Reasons for teachers' successful development of a formative assessment practice through professional development – a motivation perspective”, *Assessment in Education: Principles, Policy & Practice* (25), 2018, 576-597.
- [10] Bennett, R. E. “Formative assessment: a critical review. *Assessment in Education: Principles, Policy & Practice*, 18(1), 2011, 5-25.
- [11] Vingsle, C. „Formative assessment: Teacher knowledge and skills to make it happen“, Umel University, Department of Science and Mathematics Education, 2014. (<https://umu.diva-portal.org/smash/get/diva2:735415/FULLTEXT01.pdf>, 29.4.2020)