TEACHERS' PERSPECTIVES ON THE ROLE OF LEADERSHIP IN SUPPORTING THE INTEGRATION OF STEAM EDUCATION IN EARLY CHILDHOOD SETTINGS

Blerta MEHMETAJ

PhD Candidate,
Faculty of Philosophy, Institute of Pedagogy, Ss. Cyril and Methodius University in Skopje,
Republic of North Macedonia
bblerta.mehmetaj@hotmail.com

Lena DAMOVSKA

Faculty of Philosophy, Institute of Pedagogy, Ss. Cyril and Methodius University in Skopje,
Republic of North Macedonia
lenad@fzf.ukim.edu.mk

ABSTRACT:

Early childhood education is undergoing significant transformation as global learning frameworks increasingly emphasize creativity, collaboration, digital literacy, and problem-solving. In Kosovo, schools are aligning with these international standards while navigating structural and developmental challenges. This study examines teachers' perspectives on the role of educational leadership in supporting the integration of STEAM (Science, Technology, Engineering, Arts, and Mathematics) education in early childhood and lower primary settings in Pristina.Using a quantitative approach, data were collected through questionnaires from a sample of 60 teachers to explore how leadership practices influence teacher motivation, professional growth, and readiness to implement STEAM-based learning. The findings indicate that teachers generally hold positive attitudes toward STEAM integration and recognize leadership support as a crucial factor in its success. More than half of the respondents reported that their leaders promote STEAM and encourage interdisciplinary methods, while approximately 77% felt more motivated when supported by their leaders.Despite these positive perceptions, challenges remain, including limited participation in formal STEAM training, insufficient professional development opportunities, and constrained preparation time. The results underscore that effective leadership enhances teachers' motivation, confidence, and readiness to implement STEAM, but sustained institutional support—through continuous professional development, adequate resources, collaborative planning, and a shared school vision—is essential for the successful and sustainable integration of STEAM in early education.

Keywords: *STEAM education, leadership, motivation, professional development, early childhood education*

Introduction

The integration of STEAM education into early childhood and primary education has gained increasing attention in recent years. Kosovo, as a country with a developing education system, is aligning its preschool and primary frameworks with international standards to cultivate lifelong learners and students capable of participating in global knowledge economies. Effective implementation of STEAM, however, as in other countries, as well as in Kosovo, depends not only on curriculum design, but also on leadership practices that guide and support teachers in this process. School leaders play a critical role in shaping institutional culture, fostering collaboration, and providing opportunities for professional learning that enable teachers to adopt innovative pedagogical approaches.

Previous studies (e.g., Harris, 2014; Moomaw, 2020) highlight that supportive leadership positively impacts teacher motivation, willingness to change, and overall teaching quality. However, challenges such as limited training, lack of time, and insufficient institutional support often hinder the full realization of STEAM goals.

This study aims to examine teachers' perspectives on how leadership practices facilitate or constrain the integration of STEAM education in early childhood and lower elementary settings.

Integrated STEAM education

STEAM Education is an approach to learning that uses Science, Technology, Engineering, the Arts and Mathematics as access points for guiding student inquiry, dialogue, and critical thinking (IAI, 2014).

STEAM education fosters creativity, critical thinking, and innovation in students. It equips them with the skills needed to thrive in a rapidly evolving world (Neese, 2023).

Oriented towards developing students' problem-solving abilities, STEAM education is beneficial for students' creative problem-solving ability. STEAM teaching idea has been applied in the curriculum of primary and secondary schools (Xuejiao Yin, 2021). STEAM is a developing educational model of how the traditional academic subjects (silos) of science, technology, engineering, arts and mathematics can be structured into a framework by which to plan integrative curricula (Yakman G. , 2008).

Previous Studies on Teachers' Perceptions about Integrated STEAM Education

The growing importance given to the development of STEAM abilities to address current and future challenges has led to concerns about educational environments, and with it, the relevance of having teachers with the necessary knowledge and skills to design and implement STEAM learning sequences (Marcela Silva-Hormazabal, 2023).

A systematic review of 25 studies highlights that teachers' beliefs, perceptions, and knowledge influence how they design and implement integrated STEAM teaching activities.

Teachers express that the integrative nature of STEAM is beneficial for students and influences their motivation.

Regarding implementation barriers, teachers identify traditional school structures as a challenge when it comes to implementation. Additionally, the integrated nature of STEAM is seen as a challenge in itself by the teachers, both in terms of implementation and evaluation, recognizing factors that influence it, such as the lack of quality assessment tools, planning time, and knowledge of STEAM disciplines. Another factor they perceive is the need for support and guidance from principals, as well as flexibility for implementation. They also mention that a quality curriculum would improve the chances of success for initiatives. Finally, teachers believe that it is important to have continuous teacher development opportunities to successfully implement STEAM initiatives in the school context (Marcela Silva-Harmazabal, 2023).

Despite international efforts and reforms to promote STEM education, many authors still argue it is a challenge to concretize this goal, especially at the primary school level (Breiner, 2012; Osborne & Dillon, 2008). A possible explanation for this challenge is related to the need for a robust Content Knowledge about the subject matters to integrate by teachers (English, 2017; Kim & Bolger, 2016). In this regard, it is necessary to develop adequate PDP (Desimone, 2009), including workshops in a collaborative learning environment, where teachers can practise what they are expected to implement in the classroom (Afonso, Neves & Morais, 2005).

Research shows that leadership in schools is crucial to contribute to the efficacy of teachers' PDP. In fact, it is much more likely that the teachers will use the ideas and strategies of a PDP when they are aligned with the priorities of the respective leaders (Desimone & Garet, 2015).

The district and school leaders' support and enthusiasm in teachers' motivation for PDP is crucial to develop their ability and willingness to innovate their practices (Maria Cristina Oliveira da Costa, Antonio Manuel Dias Domingos, 2019).

Methodology

The objective of this study is to examine teachers' perspectives on the role of educational leadership in supporting STEAM integration.

The research aims to identify the leadership approaches that teachers perceive as helpful in fostering innovation and professional development, as well as the challenges they experience in this process.

Research questions
- How do teachers perceive the role of school leadership in supporting the integration of STEAM education?
- How does school leadership influence teachers' access to and participation in STEAM-related professional development?
- What challenges and opportunities do teachers perceive in the process of integrating STEAM according to current leadership practices?

Research design

A quantitative approach was used. Questionnaires were distributed to kindergarten, pre-primary, and grade 1–5 teachers to assess their perceptions of leadership effectiveness, motivation, and professional development opportunities related to STEAM.

Results

Table 1. Participant Demographics (N = 60)

Characteristic	Category	Frequency (%)
Gender	Female	57 (95%)
Gender	Male	3 (5%)
Experience	0–5 years	23 (38.3%)
Experience	6–10 years	19 (31.7%)
Experience	11–15 years	2 (3.3%)
Experience	Over 15 years	16 (26.7%)
Teaching level	Kindergarten	21 (35 %)
Teaching level	Preschool group	24 (40 %)
Teaching level	Grades 1–5	15 (25 %)

The demographic profile of the participants shows patterns that are consistent with global trends in early childhood and primary education. The overwhelming majority of female teachers (95%) reflects the gendered nature of early childhood education, a tendency widely reported by international data (OECD, 2021). This gender distribution suggests that the findings are strongly representative of the typical workforce in this educational level.

Furthermore, a considerable proportion of teachers possess substantial experience over 26% have more than 15 years of teaching. Previous research has shown that experienced teachers can be either strong adopters of innovation when supported adequately, or more hesitant if institutional structures are weak (Kelley & Knowles, 2016). Therefore, this experience profile may have influenced teachers' perceptions regarding both opportunities and challenges related to STEAM integration.

Table 2. Key questionnaire findings (selected Likert items)

Statement	Agree/Completely Agree (%)	Neutral (%)	Disagree/Completely Disagree (%)
Leader supports STEAM integration	~56%	~30%	~14%
Leader encourages interdisciplinary methods	~73%	~22%	~5%
Teachers more motivated with leader support	~77%	~22%	~1.7%
Leader provides PD opportunities	~36%	~35%	~28%
Have participated in helpful trainings	~14%	~11%	~75% (no)
Motivated to include STEAM in daily plans.	~50%	~25%	~25%

The results of the questionnaire show that teachers generally hold a positive attitude toward the integration of STEAM education and consider leadership support a key factor in its implementation. More than half of the respondents (around 56%) agree that the leader of their institution supports the integration of STEAM education and encourages the use of interdisciplinary methods in teaching, reflecting a leadership approach that promotes innovation and collaboration. Teachers' motivation is closely linked to the support they receive from their leaders: about 77% stated that they feel more motivated to integrate STEAM when they have leadership support. This aligns with the literature on transformational and distributed leadership, which highlights the role of supportive leadership in improving motivation and fostering innovation (Harris, 2014).

However, the data also reveal a significant implementation gap: while motivation is high, only 36% of teachers feel they receive adequate professional development, and 75% report not having participated in any meaningful STEAM-related training. This gap reflects similar challenges documented by (Kelly & Kettler, 2019), who argue that teacher willingness alone is insufficient without structured professional learning, resources, and leadership guidance.

This discrepancy suggests that while teachers' motivation is relatively high—often influenced by leadership encouragement and support—their practical engagement and success with STEAM remain limited. The findings imply that leadership support may enhance teachers' motivation, but sustained and structured guidance, along with professional development opportunities, are essential to translate that motivation into effective implementation. The findings also highlight a discrepancy between what teachers want to do and what they are able to do within current institutional conditions. This reinforces the need for systematic, rather than sporadic, leadership support.

The questionnaire included three open-ended questions that addressed three distinct aspects: the main advantages of integrating STEAM education, the key challenges in its implementation, and the type of support teachers would like to receive from their leader to further develop STEAM-based teaching.

Table 3. Summary of teachers' responses to open-ended questions

Question	Main points from responses
What are the main advantages of integrating STEAM education?	Enhances teaching effectiveness and creativity; promotes critical thinking, collaboration, and real-world problem solving; prepares students for the 21st century and future careers; increases student motivation and interest; connects theory with practice.
What are the main challenges in implementing STEAM education?	Lack of STEAM-related training; insufficient resources and equipment; limited dedicated spaces; rigid curricula and difficulties in assessing practical skills; limited time; inadequate support; overloaded curricula.
What additional support would you like from your leader to develop STEAM teaching?	More professional training, equipment, and planning time; encouragement for innovative projects; continuous motivation; technological support.

Teachers' responses to open-ended questions provide deeper insight into their perceptions of the advantages, challenges, and needs of STEAM. The advantages they identify - enhanced creativity, critical thinking, collaboration, real-world problem solving, and student motivation - are consistent with the benefits highlighted in prior research on STEAM education (Yakman, 2012). This suggests that teachers not only understand the pedagogical value of STEAM but also recognize its potential to enrich student learning.

Nevertheless, teachers note numerous challenges, many of which are structural rather than individual. These include lack of training, insufficient resources, limited physical space, rigid curricula, and lack of time—issues that mirror findings from (Watson, 2013) who argue that STEAM implementation is heavily dependent on institutional readiness and systemic support.

The strong emphasis on the need for leadership support—more training, resources, planning time, and encouragement—indicates that teachers view school leaders as key agents in facilitating or obstructing STEAM integration. This aligns with the broader literature suggesting that leadership plays a central role in creating the conditions necessary for interdisciplinary and innovative instructional practices (Harris, 2014).

Conclusion

This study examines teachers' perspectives on the role of educational leadership in facilitating STEAM integration in early childhood and lower primary settings in Prishtina. The findings directly address the research questions and offer clear insights into how leadership shapes the conditions for effective STEAM implementation.

Regarding the first research question, teachers perceive school leadership as a crucial factor influencing their motivation, confidence, and readiness to adopt interdisciplinary approaches. Many reported increased motivations when leaders encouraged innovation, supported interdisciplinary practices, and acknowledged their efforts—aligning with literature emphasizing the importance of transformational and supportive leadership.

In relation to the second research question, the study shows that limited access to STEAM-related professional development remains a significant barrier. Teachers emphasized the need for structured and continuous training, indicating that leadership plays a central role in enabling or restricting such opportunities.

The third research question is addressed through the identification of both opportunities and challenges within current leadership practices. While teachers recognize the strong pedagogical value of STEAM—particularly in promoting creativity, critical thinking, collaboration, and student engagement—they also face persistent structural barriers such as inadequate resources, limited teaching spaces, time constraints, and inconsistent professional development.

Teachers' responses highlight the need for sustained leadership support, including targeted training, improved resources, dedicated planning time, technological assistance, and opportunities

for collaboration. Such measures are essential to build organizational readiness for meaningful and sustainable STEAM integration.

In conclusion, although teachers show strong motivation and understanding of STEAM's benefits, successful integration depends on consistent and effective leadership support. Strengthening leadership practices, providing structured professional learning pathways, and addressing systemic resource limitations are key steps toward the long-term integration of STEAM in Kosovo's early and primary education systems. These findings carry important implications for policymakers, school leaders, and educational stakeholders committed to advancing STEAM as a central component of contemporary teaching and learning.

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