

Milica Vojvodić Savić¹
University of Novi Sad
Faculty of Education in Sombor
Bjanka Cvetković²
University of Novi Sad
Faculty of Education in Sombor
Dejan Đorđić³
University of Novi Sad
Faculty of Education in Sombor
Jelena Sredanović⁴
University of Novi Sad
Academy of Arts

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PRINTMAKING IN VISUAL ARTS EDUCATION: TEACHERS' COMPETENCIES AND PROFESSIONAL DEVELOPMENT

Abstract: The paper examines the role and significance of printmaking in Visual Arts education, with special emphasis on teachers' competencies and the need for their professional development in this field. Starting from the premise that printmaking is an equally valid visual medium, the study analyzes its educational potential and the possibilities for its application in primary school teaching. The conducted research is empirical in nature, using a descriptive method, the survey technique, and a questionnaire as the corresponding instrument. The main aim of the research was to investigate teachers' self-assessment of their competencies for using printmaking as a visual medium in Visual Arts classes in the first cycle of primary education. Based on the stated aim, the research was guided by the following research question: How do teachers assess their own competencies for applying printmaking as a visual art medium in Visual Arts classes in the first cycle of primary education? The research was conducted through an online questionnaire, and the sample was of a convenience type and consisted of 104 respondents. The results clearly indicate a significant lack of recent and regular professional development of teachers in the field of visual arts, particularly in printmaking. Although the use of printmaking is fairly widespread and teachers recognize its importance, its potential is not fully utilized, and teaching practice is dominated by the use of simple and basic techniques. Despite its pedagogical value, the printmaking remains insufficiently represented in educational practice, most often due to teachers' insufficient training, a lack of material resources, and the limited availability of professional development programs. The analysis of curriculum documents shows that they allow space for the application of printmaking, but often without clearly defined guidelines. Empirical data confirm that most teachers have not attended professional development programs in the field of printmaking and that they more frequently employ simpler printmaking techniques that do not require a high level of experience or specialized resources. The interpretation of results points to the need for practically

¹ mlcvojvodic@yahoo.com;  <https://orcid.org/0000-0003-2472-0822>

² bjankad@gmail.com;  <https://orcid.org/0009-0000-8706-4098>

³ dejan.djordjic@uns.ac.rs;  <https://orcid.org/0000-0002-1417-8366>

⁴ jelenasredanovic@yahoo.com;  <https://orcid.org/0000-0002-9994-4890>



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oriented workshops that would enable the use of alternative, non-toxic printmaking techniques in school settings. The study concludes that introducing systemic support for professional development in the field of printmaking is essential for improving the quality of Visual Arts education.

Keywords: Visual Arts education, curriculum, printmaking, professional development.

1. Introductory Considerations

Printmaking represents an autonomous visual art discipline that has developed parallel to other artistic forms, whose primary goal is not the reproduction of drawings, but rather independent exploration within artistic value frameworks (Hozo, 1988). One of the visual art fields with which students should become familiar during their education is precisely printmaking. It enables not only the development of personal artistic expression, but also the encouragement of a range of valuable qualities such as cognitive thinking, observation and perception, perseverance, consistency, team spirit, and cooperativeness. Despite the numerous contributions of the printmaking medium, there is an impression that this field is insufficiently represented in contemporary educational practice compared to other visual art media, which may be the result of several different factors.

According to Visual Arts curriculum within the first cycle of primary education, prescribed by the Ministry of Education of the Republic of Serbia, students are introduced to printmaking in two ways: through clearly defined content areas in which the use of this medium is envisaged, and through other topics that enable the application of printmaking techniques and materials in the creative process.

The successful implementation of Visual Arts education requires a broad spectrum of competencies, encompassing pedagogical-psychological and methodical skills, classroom management abilities, intra-school collaboration, and active participation within professional and social contexts (Korać, 2015). Regarding competencies specific to the field of printmaking, theoretical knowledge provides a vital foundation but remains insufficient. Teachers must possess firsthand experience with printmaking techniques, adapt activities to specific working conditions and students' developmental capacities, prioritize safety and developmental nuances, and maintain the professional competence necessary for the adequate assessment of student outcomes in this domain.

Given that teacher education faculties often lack the capacity to offer comprehensive knowledge and practical skills in the field of visual arts, there is a recognized need for additional professional development in this area (Filipović & Janjević Popović, 2018). Consequently, professional development and the concept of lifelong learning represent a response to these challenges and a means to compensate for the shortcomings of initial education. Professional development programs should promote new methodical approaches and enable the application of acquired knowledge and skills in educational practice. Programs that are narrowly specialized and focused on acquiring specific competencies not sufficiently developed during bachelor and master studies hold particular value. Accordingly, the subject of this research is the examination of teachers' self-assessment of their competencies for implementing printmaking as an artistic medium in Visual Arts education within the first cycle of primary education.

On Printmaking – From Technical Preparation to the Field of Experimentation

Printmaking (Greek: *graphein* = to write, to engrave) in the visual arts refers to all technical processes used to reproduce a drawing or image by means of a matrix. It is a visual arts discipline that exists in parallel with other modes of artistic expression, such as painting, sculpture,

photography, new media, and various other forms. The primary objective of original printmaking is not the mere duplication of a drawing; rather, it represents one of numerous independent means of artistic expression, existing on equal terms with all others (Hozo, 1988). As Cotter (2002) notes, without prints, we would not be able to understand the world's culture.

Discussing the art of printmaking invariably involves addressing the technical and technological determinants that are indispensable to the printmaker's creative process (Ćinkul, 2002). For artists who have found their medium of expression in printmaking and who work in direct dialogue with the matrix, an almost palpable passion for the matrix is recognizable. With a sketch in mind and tools in hand, they grapple with the material, initiating a dialogue that manifests as a struggle between spirit and matter. As Walter Koschatzky (1996) points out, the choice of technique for executing an artwork should be understood as a fundamental determinant of the creative process itself. Printmaking has embraced technological advancements, evolving alongside them. In an era dominated by digital imagery, the domains of printmaking are expanding. Alongside traditional techniques, which have not disappeared, works are being created that oscillate on the boundaries between different media. Printmakers are considered to be in a unique position, as they have access to both the latest digital imaging technologies and centuries-old manual printmaking techniques. Thanks to its flexibility and the potential for reproduction and translation into other forms, printmaking can serve as a key experiment in contemporary art.

By adhering to traditional techniques, perhaps more than other visual arts in the 20th century, printmaking has preserved its autonomy within the execution process, while simultaneously revealing semantic keys that correspond with new phenomena in art. [...] Unlike many other disciplines, printmaking functions within an interactive interdependence of culture, time, and society, language and essence (Anđelković-Dimitrijević et al., 2003). Contemporary printmaking, like all other visual arts, is based on the same artistic principles and carries the same intent – for the author to transform their thoughts, emotions, and experiences into a visual expression through which they can communicate with others (Noyce, 2009). In other words, printmaking is not merely a technical discipline but a full-fledged art form through which ideas and feelings are shaped and presented to the public.

Why Printmaking in Visual Arts Education?

Knowledge of the properties and applications of various techniques and materials is a prerequisite for artistic expression for both professional artists and children. While children can utilize a vast array of art techniques and materials, it is crucial that their use serves the expression of ideas and feelings (Kamenov et al., 1988, pp. 207–208). One of the artistic domains that students should encounter during their schooling, in order to develop not only their own visual expression but also a range of valuable personal traits, is printmaking. Engaging in printmaking can contribute to the development of cognitive thinking in children, as the production of a print is a complex, comprehensive process that unfolds through several interconnected phases requiring specific cognitive problem-solving strategies. The process of printmaking provides a direct tactile experience with materials, thereby positively influencing the development of observation and perception. Realizing a graphic print requires the entire production process to be followed from start to finish, representing a unique experience that fosters perseverance and consistency. Many stages of printmaking require children to be focused and centered on both the creative process and manual labor, which encourages the development of concentration. Furthermore, printmaking can foster team spirit and cooperation. For instance, during the application of ink, paper placement, and the printing itself, children can be organized into groups, collaborating and assisting one another, or creating collective prints by printing individual matrices onto a single, larger surface.

Despite the significant contributions of the printmaking medium, it appears to remain neglected in current educational practice compared to other media. Research shows that both teachers and

students experience difficulties in carrying out printmaking activities (Park et al., 2009; Wang et al., 2025), which served as a starting point for defining the problem and designing this study. Engaging in printmaking requires a certain level of dexterity in handling tools and materials; however, this observation should not serve as an excuse for excluding this valuable medium from art activities. In addition to the fear of the mechanical process's complexity, it is assumed that the absence of printmaking stems from prejudices regarding the necessity of expensive and impractical equipment, to the lack of teacher's knowledge in this field (Andrews, 1964). A particular challenge is posed by specific printmaking content, such as multicolor printing (Park et al., 2009). An additional complicating factor is the fact that most traditional printmaking techniques do not meet safety requirements and pose a direct health risk to children. The solution to this problem lies in adapted, non-toxic techniques that are safe for both health and the environment (Sabour, 2017); however, a significant majority of primary school teachers and art educators are not acquainted with these alternative solutions. These findings indicate the need for systematic professional development of teachers in order to familiarize them with modern, safe, and pedagogically adapted printmaking techniques. This would enable their broader and higher-quality application in Visual Arts classes, in line with contemporary didactic requirements.

The current Visual Arts curriculum within the first cycle of primary education, prescribed by the Ministry of Education of the Republic of Serbia (<https://zuov.gov.rs/zakoni-i-pravilnici/#504-2191-wpfd-1-osnovi-obrazovanja-zakoni-i-pravilnici>), allows students to engage with printmaking in two ways: through clearly defined content that stipulates the use of the printmaking medium, and through other areas and themes conducive to the application of printmaking techniques and materials in creative work. The official curriculum for the first grade envisions that students develop their artistic skills through various activities but does not provide precise guidelines regarding the representation of specific techniques, such as printmaking. Although concrete content regarding the printmaking medium is not offered, the areas *Relationships in the Visual Field* and *Form-making* leave ample room for introducing students to the basics of printmaking through handprints, or printing leaves, fruits, etc. In the second grade, students are introduced to stamp-making within the area of *Visual Communication*. In addition to learning why people create stamps and how they facilitate non-verbal expression, students acquire the technical and technological procedures of making a stamp as a form of printmaking matrix.

In the third grade, within the thematic unit *Materials*, it is envisioned that students become familiar with content dealing with the properties of various materials for artistic shaping, the tools that can be used for artistic expression, and the appearance of materials. Students are also introduced to different techniques, the relationship between materials, art techniques, and ideas, the products of artistic crafts, and the importance of artistic recycling. Upon completion of the grade, and in relation to this unit, the student will be capable of following instructions for the preparation, use, maintenance, and storage of materials and equipment; connecting artistic professions and crafts with their corresponding products; reshaping packaging and recyclable objects by changing their functional use; and expressing their experiences, emotions, imagination, and observations through selected materials, tools, and techniques. The contents of this unit are integrated with other thematic blocks and stipulate the introduction of printmaking as an artistic field. It is recommended that students be introduced to printing by creating improvised matrices; an example provided is the preparation on a Styrofoam/polystyrene food packaging tray, where the drawing is incised with felt-tip pens, and the ink is applied with a wide brush or a piece of stiff cardboard. In the fourth grade, stamp-making is mentioned as one of the recommended contents within the unit *Visual Communication*, while within the unit *Composition*, it is suggested that students explore texture composition through frottage as a mode of printing expression. Teaching units that do not involve a precisely defined use of a specific technique or material leave room for experimentation in the domain of printmaking. The teacher has the freedom to utilize the printmaking medium in the realization of various teaching units within the proposed themes.

Teachers' Subject-Specific Competencies as a Factor in the Quality of Visual Arts Education

Teachers' professional competencies represent an extensive body of research (Gojkov, 2006; Jerković et al., 2012; Kostović, 2005; Radulović, 2007; Van Werven et al., 2023; Zakirova, 2016; Zaporozhchenko et al., 2022). The teacher's role in the development of children's artistic creativity, including their expression through printmaking, is of great significance; to fulfill this role adequately, the teacher must possess a range of knowledge and skills. The spectrum of competencies required for the successful implementation of Visual Arts education is broad, encompassing both classroom-based competencies (pedagogical-psychological-methodical and classroom management skills) and those necessary for the successful performance of duties within the school and a professional role in society (Korać, 2015). An important factor is subject-specific teaching competencies, which imply that a teacher, much like a specialist art educator: understands the significance and role of art education, as well as their own roles and tasks; knows the requirements for instructional modeling; systematically utilizes various didactic tools; understands the criteria for selecting stimulating topics; knows and applies criteria for evaluating children's artwork; understands the function of exhibitions of children's artworks; competently incorporates works of art into teaching; knows the principles for nurturing children's artistic expression; understands the ways in which various educational contents intertwine; and possesses knowledge of the core subject area (Vojvodić, 2018). When we say that a teacher knows the core subject area, it means they are familiar with artistic heritage, the theory of form, art techniques and materials, as well as contemporary artistic practice (Karlavaris, 1991). We see that the spectrum of required competencies is extensive, and that knowledge concerning art techniques and materials constitutes only one part of it. It is desirable for a teacher to be familiar with all artistic domains they will introduce to children during art activities—drawing, painting, printmaking, sculpture, multimedia, and the shaping of various materials. It is therefore essential that the teacher has a strong command of printmaking techniques, which, as previously mentioned, are often neglected in educational practice.

When it comes to competencies in the field of printmaking, theoretical knowledge is significant but insufficient—it is essential for the teacher to possess personal experience in matrix creation and the printing process, and for art activities dedicated to printmaking to be organized in accordance with the conditions in which they are implemented. In adapting the activity to the working environment, the teacher must consider spatial organization, table arrangements, and the preparation of tools and materials. All these organizational elements should provide the conditions for safe engagement with printmaking. The teacher must pay particular attention to: the operation of the printing press and student movement around it; the adaptation of tools to children's manual abilities; the use of eco-friendly inks; and the use of non-aggressive chemical solvents for cleaning tools and removing ink.

When selecting and adapting printmaking techniques, the teacher must also be familiar with the students' age-appropriate capabilities, as well as their individual abilities and needs regarding this field. While it is desirable to introduce students to various printmaking techniques and materials, this must be done gradually and systematically, allowing them sufficient time to explore their expressive possibilities and personal preferences. The teacher must not forget that the primary role of printmaking techniques and materials is to facilitate the creative process, enable the expression of ideas, and preserve the spirit of play within art activities.

It is essential for the teacher to possess specific competencies regarding the assessment of children's prints. The evaluation of achieved results helps improve the work of both the student and the teacher, provided that contemporary methodical principles are respected in the process. This implies that when assessing children's prints, as well as other products of children's artistic creativity, numerous factors must be taken into account: the fulfillment of educational objectives, motivation, effort invested, satisfaction with the work, the child's personal needs, etc. During the

analysis, the focus is placed on the printmaking process itself rather than the final print. Therefore, printmaking technology must not overshadow the essence, which is the freedom of artistic expression (Hozo, 1988). Consequently, it is of secondary importance whether the prints are identically pulled, whether too little or too much ink has been applied, whether the matrix was over-wiped or insufficiently wiped, or whether the margins and the back of the paper are perfectly clean.

Challenges of Professional Development for Teachers in the Domain of Art Pedagogy

High-quality initial education is the key to preparing teaching staff capable of successfully meeting the demands of the modern school system. Curricula at higher education institutions in the Republic of Serbia are designed to provide future teachers with knowledge and skills across various fields; however, current practice points to certain deficiencies in preparing staff for the implementation of visual arts education. It is considered that a comprehensive approach to art education requires knowledge in the fields of psychology, pedagogy, and didactics, as well as organizational abilities, knowledge and skills in artistic production, art history, art criticism, and aesthetics (Joksimović, 2009). It is understood that teacher education faculties are not in a position to offer such a wide spectrum of professional knowledge and skills in the field of visual arts. Research indicates that future teachers in our region are aware of these challenges and that, although they are partially or largely satisfied with their initial education in this field, they recognize the need for further professional development (Tomljenović & Novaković, 2017).

It is precisely professional development and the concept of lifelong learning that should address these challenges and compensate for the shortcomings that are an inevitable part of initial education. Professional development programs should promote new methodical approaches and enable the application of newly acquired knowledge and skills in educational practice; particularly beneficial are those that are narrowly specialized and focused on the acquisition of highly specific knowledge and skills, the development of which was not provided for during initial education (Vojvodić Savić, 2024, p. 119).

If we examine the currently active List of Approved Programs for Permanent Professional Development of Teachers, Preschool Educators, and Professional Associates for the school years 2022/23, 2023/24, and 2024/25, provided by the Institute for the Improvement of Education (zuov.gov.rs/lista-odobrenih-programa-stalnog-strucnog-usavrsavanja-nastavnika-vaspitaca-i-strucnih-saradnika-za-skolsku-2022-2023-2023-2024-2024-2025-godinu/), out of a total of 1,132 programs, only 15 deal with art or visual arts education: *Art Laboratory*, *Music and Visual Arts in the Context of Sustainable Development*, *Printmaking School*, *Integrative Teaching in Mathematics and Visual Arts*, *Playing with Art Elements*, *Caricature in the Classroom - Caricature as an Artistic Expression*, *Means of Communication*, and *a Tool for Interdisciplinary Teaching*, *Artistic Creativity in School*, *The Artist's Creative Code - A New Approach to Visual Arts Teaching for Teachers, Educators, and Art Instructors*, *A Holistic Approach to the Education of Preschool and Lower Primary School Children in the Realization of Art Activities and Visual Arts Education*, *Hand Weaving School*, *Drama Games in the Upbringing and Education of Children*, *Stage Puppets - From Idea to Realization*, *Origami in Teaching*, *From Paper to Art*, and *STEAM Education (Science Technology Engineering Art Mathematics)*. Of the aforementioned seminars, only one focuses on printmaking and training educational staff to engage with it.

An example of a training program aimed at developing the specialized professional competencies of primary school teachers, preschool educators, and art educators for engaging in printmaking within school conditions is *Printmaking and Children's Artistic Creativity*, accredited by the Ministry of Education of the Republic of Serbia for the previous professional development cycle ([/zuov.gov.rs/](https://zuov.gov.rs/)). The training program enables participants to: - independently or collaboratively plan art activities focusing on the use of printmaking as an artistic medium; - apply procedures that develop children's understanding of the characteristics of the printmaking medium and the ability

to utilize its expressive possibilities, as well as visual literacy in general, creative potential, sensory sensitivity, and divergent and critical thinking; - perform evaluation, self-evaluation, and the improvement of educational work in accordance with the specificities of the artistic domain of printmaking elements. The training was conducted in small groups through four sessions, where participants tested the acquired knowledge through practical tasks within workshop activities. The first session, titled *The Role of Art Techniques and Materials in the Process of Art Education*, analyzed fundamental issues such as the role of art education in child development and the function of art techniques and materials in the creative process. In the second session, titled *Introduction to Printmaking*, participants were introduced to the characteristics of printmaking as a specific artistic medium, its origins, and historical development. Furthermore, through practical demonstrations, they were presented with types of printing and various printmaking techniques, as well as the basic technical and technological requirements of relief, intaglio, and planography. The third session, *Methodical Aspects of Applying Printmaking in the Educational Process*, focused on the contributions of the printmaking medium to the development of cognitive thinking, observation, perception, perseverance, consistency, concentration, and cooperativeness in children, alongside practical advice on successfully organizing and implementing a printmaking activity. Within the fourth session, titled *Specificities of Printmaking Techniques and Materials and Their Application in Educational Work*, a practical presentation was conducted of three adapted printmaking techniques—cardboard print, white-line printmaking, and kitchen lithography—which can be performed with children. Such a structured program allows participants to independently experiment with matrix creation and printing, which for many represents a unique experience and fully qualifies them to apply alternative printmaking techniques in their work with children.

Based on theoretical considerations and the research findings, the following general research hypothesis was formulated: It is assumed that teachers perceive that they possess competencies for applying printmaking in Visual Arts classes; however, their application is influenced by various factors related to professional development and working conditions.

The following specific hypotheses were derived from the general hypothesis:

1. **Hypothesis H1:** It is assumed that the majority of teachers have not attended professional development programs in the field of Visual Arts and printmaking.
2. **Hypothesis H2:** It is assumed that teachers use printmaking in Visual Arts classes occasionally or rarely, apply simpler and adapted forms of printmaking expression, and most often do so in situations where it is explicitly required by the Visual Arts curriculum.
3. **Hypothesis H3:** It is assumed that there are statistically significant differences in the frequency and manner of using printmaking depending on participation in professional development programs in the field of Visual Arts and printmaking.
4. **Hypothesis H4:** It is assumed that when assessing children's printmaking, teachers place the greatest importance on student motivation, effort, and freedom of artistic expression.
5. **Hypothesis H5:** It is assumed that students show interest in using and exploring the printmaking medium in Visual Arts classes.
6. **Hypothesis H6:** It is assumed that teachers perceive their competencies for applying printmaking as being largely acquired through self-directed professional development, and that there are statistically significant differences in teachers' self-assessment of competencies depending on participation in professional development in Visual Arts and printmaking.
7. **Hypothesis H7:** It is assumed that teachers identify lack of professional development and unfavorable material and technical school conditions as the most significant barriers to the application of printmaking.

2. Method

Aim of the Study. The aim of the present study was to examine primary school teachers' self-assessed competencies for the implementation of printmaking as an art medium in Visual Arts education during the first cycle of primary education (grades 1st to 4th). Based on the stated aim, the research was guided by the following research question: How do teachers assess their own competencies for applying printmaking as a visual art medium in Visual Arts classes in the first cycle of primary education?

Type and nature of the research. The conducted research is empirical in nature and has an exploratory character, as it is aimed at gaining deeper insight into teachers' self-assessment of their competencies for applying printmaking as a visual art medium in Visual Arts classes.

Sample. The study sample consisted of 104 participants, including 98 female teachers and 6 male teachers. The mean age of the participants was 46.08 years, and the average length of professional experience in education was 19.75 years. Two thirds of the participants resided in urban areas. Approximately half of the respondents had completed master's-level studies, while 47.12% had completed undergraduate studies. A detailed overview of the sample according to sociodemographic variables is presented in Table 1.

Table 1. Distribution of the Sample by Sociodemographic Variables

		f	%
Gender	Male	6	5.77%
	Female	98	94.23%
Educational level	College Degree	0	1.92%
	Bachelor's studies	4	47.12%
	Master's Studies	53	50.96%
	Specialist Studies	0	0.00%
	Doctoral Studies	0	0.00%
Place of residence	Rural	30	28.85%
	Urban	74	71.15%
Age / M=46,08, Min.=24. Max.=64			
Length of professional experience / M=19,75, Min. = 1, Max.=42			

Instrument. The descriptive method and the survey technique were used. The instrument applied in this study, entitled the *Questionnaire on Competencies for the Use of Printmaking in Visual Arts Education*, was constructed specifically for the purposes of this research. It consists of five items collecting general demographic data, eight closed-ended questions, and a 12-item Likert-type scale designed to assess teachers' competencies for implementing printmaking techniques in Visual Arts classes. The instrument measures teachers' self-assessment of competencies for the use of printmaking in Visual Arts classes. The internal reliability of the instrument, expressed by Cronbach's alpha, was 0.78, indicating an acceptable level of consistency.

Procedure. The study was conducted during May and June 2025 through an online questionnaire. The instrument was distributed to schools with which the researchers had established prior collaboration, either through school counsellors or via direct contact with participants. Completion of the questionnaire required approximately 10 minutes. Participation was voluntary and fully anonymous.

Data Analysis. The data collected from the study were processed using the IBM SPSS for Windows software, version 26. Descriptive statistics (means, frequencies, and percentages) were calculated. In addition, one-way analysis of variance (ANOVA) and the chi-square test were employed to examine differences in responses among groups.

3. Results

At the beginning of the questionnaire, respondents were asked whether they had participated in professional development programs in the field of Visual Arts and specifically in printmaking. The results are presented in Table 2.

Table 2. Participation in professional development programs

	Yes, in the past three years	Yes, more than three years ago	No
	f (%)	f (%)	f (%)
Professional development in Visual Arts	6 (5.77%)	29 (27.88%)	69 (66.35%)
Professional development in Printmaking	2 (1.92%)	6 (5.77%)	96 (92.31%)

Two thirds of teachers have never attended a professional development program in the field of Visual Arts, while 27.88% attended such training more than three years ago, and 5.77% participated in professional development activities within the past three years. With regard to professional development in the field of printmaking, 92.32% of teachers reported that they had not attended any programs, 5.77% attended them more than three years ago, and 1.92% participated in such training during the previous three years.

Table 3. Use of printmaking in Visual Arts education

		f	%
Frequency of use of printmaking in Visual Arts education	Never	5	4.81%
	Rarely	43	41.35%
	Occasionally	52	50.00%
	Often	4	3.85%
I use printmaking in Visual Arts education:	Only in those teaching units in which the use of printmaking is explicitly prescribed by the curriculum	41	39.42%
	I use printmaking also when is not explicitly prescribed	48	46.15%
	Less than prescribed by the curriculum	10	9.62%
	I do not use printmaking	5	4.81%

Half of the teachers use printmaking in Visual Arts education occasionally, 41.35% use it rarely, whereas 4.81% never use it and 3.85% use it frequently. The largest proportion of teachers (46.15%) use printmaking even when implementing content in which the use of printmaking is not explicitly prescribed, while 39.42% use it only in those teaching units in which the use of printmaking is explicitly prescribed by the curriculum (Table 3).

We examined whether there were statistically significant differences in the frequency and mode of using printmaking in Visual Arts education with respect to whether teachers had attended professional development programs in the field of Visual Arts and printmaking. The results of the conducted analyses indicate that there is no statistically significant difference in the frequency of using printmaking in Visual Arts education with regard to attendance at programs in the field of Visual Arts ($F = 1.69$, $p = 0.19$) or printmaking ($F = 2.31$, $p = 0.10$). Furthermore, no statistically significant differences were found in the mode of use with respect to whether teachers had attended professional development programs in the field of Visual Arts ($\chi^2 = 3.80$, $p = 0.70$) or in the field of printmaking ($\chi^2 = 1.95$, $p = 0.92$).

Table 4. Use of specific forms of printmaking expression

	Never f (%)	Rarely f (%)	Occasionally f (%)	Often f (%)
Linocut	70 (67.31%)	24 (23.08%)	10 (9.62%)	0 (0.00%)
High-print simulation (stamping with potato, rubber, sponge, etc.)	2 (1.92%)	29 (27.88%)	59 (56.73%)	14 (13.46%)
Printmaking play activities (hands, feet, vegetables, etc.)	1 (0.96%)	24 (23.08%)	61 (58.65%)	18 (17.31%)
Monotype	41 (39.42%)	45 (43.27%)	18 (17.31%)	0 (0.00%)
Cardboard printing	22 (21.15%)	47 (45.19%)	31 (29.81%)	4 (3.85%)

Teachers most frequently use printmaking play activities (making prints with hands, feet, vegetables, etc.) as a form of printmaking expression in art classes, with 58.65% using it occasionally and 17.31% often. The second most frequently used form of printmaking expression is high-print simulation, which 56.73% use occasionally and 13.46% often in art classes. Following these two forms are cardboard printing, then monotype, and finally linocut, which is not used by approximately two-thirds of teachers (Table 4).

Table 5. Assessment of children's printmaking work

	Responses		Percent of cases
	f	%	
Neatness of the graphic print	38	9.07%	36.89%
Correct application of printmaking techniques	39	9.31%	37.86%
Fulfillment of lesson outcomes	32	7.64%	31.07%
Freedom of children's artistic expression	86	20.53%	83.50%
Motivation for work and effort invested	86	20.53%	83.50%
Child's satisfaction with their work	64	15.27%	62.14%
Individual progress of the student	57	13.60%	55.34%
Student achievement compared to peer group	12	2.86%	11.65%
I do not use printmaking in Visual Art classes	5	1.19%	4.85%
Total	419	100.0%	100.00%

When assessing children's printmaking work, teachers primarily focus on motivation for work and effort invested (83.50%) and freedom of children's artistic expression (83.50%), while the least focus is placed on student achievement compared to the peer group (11.65%) (Table 5).

Table 6. Students' interest in using and exploring printmaking media

	f	%
Not interested	1	0.96%
Only complete assigned tasks (meet minimum requirements)	12	11.54%
Actively participate in creative activities and add a personal touch to prints	86	82.69%
I do not use printmaking in Visual Arts classes	5	4.81%
Total	104	100.00%

Teachers report that in 82.69% of cases, students actively participate in creative activities and add a personal touch to the production of graphic prints (Table 6).

Table 7. Competencies for using printmaking

	Strongly disagree f (%)	Disagree f (%)	Don't know f (%)	Agree f (%)	Strongly agree f (%)
I acquired competencies for applying printmaking during initial teacher education	17 (16.35%)	26 (25.00%)	15 (14.42%)	35 (33.65%)	11 (10.58%)
I acquired competencies for applying printmaking through programs and other forms of mandatory professional development	43 (41.35%)	32 (30.77%)	10 (9.62%)	17 (16.35%)	2 (1.92%)
I acquired competencies for applying printmaking through self-directed learning (reading professional literature, visiting museums, galleries, courses, online resources, etc.)	6 (5.77%)	12 (11.54%)	21 (20.19%)	48 (46.15%)	17 (16.35%)
I consider myself competent in using printmaking in Visual Art classes	5 (4.81%)	14 (13.46%)	40 (38.46%)	37 (35.58%)	8 (7.69%)
I consider myself competent in assessing children's printmaking work and evaluating outcomes in this field	4 (3.85%)	14 (13.46%)	33 (31.73%)	46 (44.23%)	7 (6.73%)
I am familiar with adapted printmaking techniques/alternative solutions for applying printmaking in school conditions	7 (6.73%)	30 (28.85%)	17 (16.35%)	43 (41.35%)	7 (6.73%)
I consider myself competent in applying adapted printmaking techniques according to the school's material and technical conditions and students' age characteristics	8 (7.69%)	14 (13.46%)	30 (28.85%)	44 (42.31%)	8 (7.69%)

Teachers acquired competencies for using printmaking primarily through self-directed learning, followed by initial teacher education, and thirdly through programs and other forms of mandatory professional development. Almost one-fifth of teachers do not consider themselves competent in using printmaking in Visual Arts classes, while about one-third are either uncertain or consider themselves competent. Regarding competencies in assessing children's printmaking work and evaluating outcomes, approximately half of the respondents agree they possess such competencies, with a similar proportion considering themselves competent in applying adapted printmaking techniques according to school material and technical conditions and students' age characteristics. 35.58% of teachers are not familiar with adapted printmaking techniques/alternative solutions for applying printmaking in schools, 48.08% are familiar, and 16.35% are unsure (Table 7).

A one-way analysis of variance was conducted to determine the existence of statistically significant differences in responses based on whether teachers had undergone professional development in Visual Arts education or printmaking. Results indicate no statistically significant differences regarding professional development in printmaking. Concerning Visual Arts education, differences exist in teachers' familiarity with adapted/alternative solutions and competencies for applying these solutions. Specifically, differences were observed between respondents who completed professional development in Visual Arts education more than three years ago and those who have never undergone such training, with those trained achieving statistically higher scores on both measures.

Table 8. Hindering factors for printmaking use

	Strongly disagree f (%)	Disagree f (%)	Don't know f (%)	Agree f (%)	Strongly agree f (%)
Material and technical conditions of the school hinder my use of printmaking	6 (5.77%)	30 (28.85%)	31 (29.81%)	24 (23.08%)	13 (12.50%)

Lack of personal experience in creating printmaking work hinders my use of printmaking	17 (16.35%)	31 (29.81%)	21 (20.19%)	30 (28.85%)	5 (4.81%)
Inadequate safety conditions for conducting art lessons hinder my use of printmaking	17 (16.35%)	33 (31.73%)	23 (22.12%)	27 (25.96%)	4 (3.85%)
Lack of professional development programs and other forms of mandatory professional development hinders my use of printmaking	9 (8.65%)	18 (17.31%)	29 (27.88%)	30 (28.85%)	18 (17.31%)
Lack of knowledge about adapting techniques to school conditions/students' age characteristics hinders my use of printmaking	13 (12.50%)	29 (27.88%)	21 (20.19%)	29 (27.88%)	12 (11.54%)

Among the listed factors that may hinder the use of printmaking, teachers identify the lack of professional development programs and other forms of mandatory professional development as the most significant ($M = 3.29$), followed by unfavorable material and technical school conditions ($M = 3.07$), lack of knowledge about adapting techniques to school conditions/students' age characteristics ($M = 2.98$), lack of personal experience in creating printmaking work ($M = 2.75$), and finally, inadequate safety conditions for conducting Visual Arts lessons ($M = 2.69$). Results do not differ based on whether teachers have undergone professional development in Visual Arts education or printmaking (Table 8).

4. Discussion

The results clearly indicate a significant lack of recent and regular professional development for teachers in the field of Visual Arts education, and specifically in printmaking. The fact that two-thirds of the respondents have never attended a professional development program in visual arts, and over 90% have not completed a professional development program in printmaking, points to a systemic issue in the continuous education of teachers for this specific domain. Such a situation can directly impact the quality of instruction, limiting the sources of ideas and the adoption of contemporary approaches in visual arts education. The main observation is that teachers cite self-directed professional development as their primary source of competence in printmaking, which highlights their personal commitment but also underscores the lack of systemic support through formal education and professional development programs. It is concerning that a significant number of teachers do not consider themselves competent or feel insecure about their competencies. Combined with the finding that self-improvement is crucial, this data indicates a need for higher quality and more practical professional development programs. The fact that professional development in the field of visual arts—though not specifically in printmaking—is associated with greater familiarity with adapted techniques suggests that professional development programs of a more general nature can have a certain positive impact. The fact that professional development programs attendance showed no statistically significant impact on practice appears surprising, given the generally accepted thesis that professional development is one of the key factors in improving instructional practice (Darling-Hammond et al., 2017; Guskey, 2002). Research indicates that formal attendance at training sessions does not automatically translate into increased competence; rather, the key lies in how the acquired knowledge is integrated into daily work (Avalos, 2011). This points to the necessity of revising the content of professional development programs toward the acquisition of practical knowledge in the field of visual arts, as well as the need for continuity in training and a mentoring approach, as evidenced by other studies (Opfer & Pedder, 2011).

Although the use of printmaking is relatively widespread, the fact that only 3.85% of teachers use it frequently suggests that its full potential remains untapped. It is encouraging that the majority of teachers employ printmaking even outside explicitly prescribed teaching units, which indicates creativity and the taking of initiative. However, the finding that there is no statistically significant correlation between professional development program attendance and the frequency or manner

of using printmaking is surprising. This suggests that the professional development programs themselves might not be sufficiently effective or focused on practical application, or that other factors (such as material conditions or personal interest) play a more significant role. The dominance of simpler and less demanding techniques, such as 'printmaking play activities' and 'relief print simulation', compared to more complex techniques like linocut and monotype, indicates an adaptation to available resources, time constraints, and the developmental characteristics of the students. While this is a rational approach, it simultaneously reveals limitations in technical equipment and/or the level of teachers' professional competencies for implementing more complex printmaking procedures. The almost complete absence of use of linocut clearly demonstrates the boundaries of current practice. A positive finding is the fact that teachers highlight effort invested, motivation, and freedom of child expression as the most important assessment criteria, rather than formal technical aspects or comparisons with peers. This reflects contemporary pedagogical principles that value the process, individual progress, and creativity, rather than just the final product. Such an attitude contributes to a positive classroom atmosphere and encourages children's perseverance and exploration. The high percentage of teachers reporting that students participate eagerly in printmaking activities is an extremely favorable indicator. It suggests that, when implemented, printmaking serves as a motivating and attractive method of work, which provides a strong argument for its increased inclusion in both the curriculum and educational practice.

These findings are consistent with the study by Wang et al. (2025), which indicates that printmaking represents a significant pedagogical medium that contributes to the development of children's creativity, fine motor skills, sensory integration, and cultural awareness. The authors included relevant literature published between 2020 and 2025 in their analysis; therefore, the study reflects contemporary educational practices and current theoretical foundations. The authors particularly emphasize that the educational potential of printmaking is realized through experiential, inquiry-based learning as well as through carefully designed and age-appropriate activities, which provides a coherent framework aligned with the above-presented results and offers a basis for further research.

By analyzing the research results and the stated hypotheses, we conclude that the general hypothesis is partially accepted. Namely, the results show that teachers to a certain extent perceive that they possess competencies for applying printmaking in Visual Arts classes, while the lack of professional development and unfavorable material and technical school conditions were identified as significant factors influencing its implementation. However, the existence of statistically significant differences in all aspects of competencies and the use of printmaking in relation to professional development was not confirmed. By reviewing the results and the specific hypotheses, it can be concluded that:

- Hypothesis H1 is accepted: The majority of teachers have not attended professional development programs in the field of Visual Arts and printmaking. The results show that 66.35% of teachers have never attended seminars in Visual Arts, while as many as 92.31% have not attended programs in the field of printmaking.
- Hypothesis H2 is partially accepted: The results show that teachers use printmaking most often occasionally or rarely, and that they predominantly use simpler and adapted forms of printmaking expression, such as printmaking games and simulations of relief printing. However, the part of the hypothesis stating that teachers use printmaking most often only when explicitly required by the curriculum was not confirmed, since the majority of respondents reported using printmaking even in situations not explicitly prescribed by the curriculum.
- Hypothesis H3 is not accepted: No statistically significant differences were found in the frequency and manner of using printmaking in relation to participation in professional development programs in Visual Arts and printmaking. The obtained statistical values did not reach the level of significance.

- Hypothesis H4 is accepted: When assessing children's printmaking, teachers place the greatest importance on student motivation, effort, and freedom of artistic expression, as confirmed by the highest percentage of responses in these categories.
- Hypothesis H5 is accepted: The majority of teachers believe that students show interest in using and exploring the printmaking medium in Visual Arts classes, with 82.69% of respondents stating that students willingly participate in art activities and add a personal touch to printmaking.
- Hypothesis H6 is partially accepted: The results show that teachers perceive their competencies for applying printmaking as being largely acquired through self-directed professional development. However, statistically significant differences in self-assessment of competencies were not confirmed in relation to professional development in printmaking, while they were partially confirmed in the field of Visual Arts, specifically regarding familiarity with adapted printmaking techniques and competencies for their application.
- Hypothesis H7 is accepted: Teachers identify the lack of professional seminars and other forms of professional development, as well as unfavorable material and technical school conditions, as the most significant barriers to the application of printmaking, which is confirmed by the highest mean values on these statements.

5. Conclusion

The obtained results indicate that teachers are oriented toward the process and the progress of their students; however, numerous challenges remain in the implementation of printmaking within their practice. The findings of this research provide an encouraging picture of teachers' attitudes in the field of Visual Arts education, while simultaneously opening a space for the critical reassessment of actual practice, initial education, and professional development in this domain. The lack of systemic support through regular and high-quality professional development, incomplete competencies acquired through formal education, and inadequate material conditions significantly limit the full and frequent application of printmaking. This may point to structural barriers within the Serbian educational system, where, despite an awareness of the importance of using printmaking, teachers operate within the normative requirements of the curriculum, which potentially influences the homogeneity of their responses. The national framework for professional development often entails short, one-day seminars without systematic monitoring of their impact on teaching practice; they are frequently overly theoretically oriented, or the frequency of attendance is insufficient to achieve a measurable effect. Individual effort and teacher creativity are insufficient for overcoming systemic limitations. It is essential for educational institutions to actively engage in providing continuous professional development for teachers in the fields of visual arts and printmaking.

The aforementioned findings highlight the limitations of research based on self-assessment, as they raise the question of a potential gap between subjective self-perception and the objective level of competence. It can be assumed that teachers who have not undergone relevant professional development may believe they possess sufficient knowledge and skills in this field; consequently, such training does not become their primary choice when creating personal professional development plans. Another limitation relates to the sample size ($N = 104$), which may affect the possibility of broader generalization of the results.

Based on the analysis of the obtained results, the following guidelines can be identified for improving current educational practice in the domain of visual arts, specifically printmaking: redesigning professional development programs to be more practical and accessible; incorporating long-term mentoring support; upgrading material and technical conditions in schools; and integrating more practical content and instruction in the field of printmaking into the initial education of future primary school teachers.

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Biographical notes:

Milica Vojvodić Savić is an Assistant Professor of Visual Arts Education at the Faculty of Education in Sombor, University of Novi Sad. She is the author of several solo exhibitions and numerous papers published in scientific journals. Her current research interests include art pedagogy, teacher competencies, professional development, and children's artistic creativity.

Bjanka Cvetković is a Teaching Assistant and a doctoral student in her third year of the PhD program in Class Teaching Methodology at the Faculty of Education in Sombor, University of Novi Sad. Her current research interests encompass teacher competencies and professional development, the quality and structure of textbooks, and content acquisition in early childhood education.

Dejan Đorđić is an Associate Professor of Pedagogical Sciences at the Faculty of Education in Sombor, University of Novi Sad. He has authored and co-authored dozens of scientific papers in international and national journals. His current research interests include school climate, educational leadership, professional development, distance learning, and inclusive education.

Jelena Sredanović is a Full Professor at the Printmaking Department of the Academy of Arts, University of Novi Sad. She has held numerous solo exhibitions and participated in many collective exhibitions both domestically and abroad. She is the recipient of prestigious awards and recognitions in the field of printmaking. In her work, she continuously nurtures the medium of printmaking, spanning from traditional techniques to modern digital prints.