

The Use of Graphic Techniques with Preschool-Aged Children

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Abstract

This paper presents a short outline of graphic techniques, their characteristics and development. Examples of good teaching practice have been presented in the paper, especially the work of Italian designer and pedagogue Bruno Munari. In a very creative yet technically simple way, Munari offered children imprinting activities, both mechanical and digital, by the use of the printing machine. The second part of this paper is the analysis of the preliminary research which aimed to find out the level to which a group of female teachers were familiar with graphic techniques; the extent to which they used them in their work with children; and which are, according to the participants, possible obstacles in the use of graphic art techniques. For these purposes, a questionnaire was prepared and used with 35 female preschool teachers from a number of preschool institutions of the County of Istria. The results have shown that the participants evaluated their knowledge of the flat print as very good and the general knowledge of the deep print as very poor; the most frequently used are the high-end and flat print techniques, while the least used are the deep and digitalized print. According to preschool teachers, the largest percentage of suggested obstacles relates to the lack of equipment. Further research on a larger sample is suggested, while preschool teachers should be offered art training directed toward the adaptation and simplification of graphic techniques for preschool-aged children. We are of the opinion that this could increase the frequency of the graphic techniques offer and consequently enrich children's creative processes.

Key words: Bruno Munari; mechanical and digital printing; preschool art pedagogy.

Introduction

In its wider sense, press printing means any copying done by imprinting (Klein, 1977). "What is common for all graphic techniques is that they have a surface (matrix)

on which the graphic artist makes the drawing surface which then prints a larger number of drawings called graphic sheets” (Peić, 1966, p. 44). Regarding the ways the matrix is processed, graphics is divided into high-end prints, deep prints and flat prints. This paper also presents the digitalised print which, thanks to digitalised machines (the photocopier, printer, scanner and fax), reproduces the picture. Peić (1968) has compared graphics to drawings and pictures and brought forward its similarity to the watercolour, chalk, coal and pencil techniques from which the richness of the artistic language expressed by the artist or child can be read.

The aim of this paper is neither to describe the detailed characteristics of graphic techniques products and certain graphic technique process nor its historical development, but it is however interesting to mention that human striving for the solution to problems by simplifying them and making work easier has led to the discovery of the photocopying machine. It was Chester Carlson, enduring the pain caused by arthritis due to the long rewriting process of documents, who came to the mentioned discovery. The first word, 10.-22.-38 Astoria, was photocopied in 1938 thus widening the chapter of digitalized printing (Bozzo, 1996; Dickerson, 2013). It could be said that the path set by ancient Egyptian scribes, the Babylon seal rings manufacturers or Renaissance printers is, in fact, the path taken by Chester Carlson in the eve of the so called digital era. Today’s children, in the information storm and individual, original and critical thinking crisis, should be supported in their individual planning and encouraged in reaching their own, original ways of research and discovery. This paper analyses the extent to which the pedagogical practice (the relationship child – preschool teacher) is enveloped by the established models and, on the other hand, how much it studies the new and different processes through the prism of the use of graphic techniques by preschool-aged children.

Graphic Art Techniques and Preschool-Aged Children

The printing process begins with sketching, making a matrix and imprint, and multiplying the imprint. Regarding the working principle on the matrix (creating the surfaces which imprint colour), there are the techniques of high-end, deep, flat and digitalized print. The high-end print matrices are created by incisions in the matrix matter (wood, linoleum, Siporex, Styrofoam, cardboard), while the lines and shapes which should be printed on paper are those on the higher parts of the matrix (Jakubin, 1989; Smith & Holt, 2004). “The deep print is the technique where the painting is incised into a board and printed from the deep parts of the matrix to which printing paint has been applied” (Jakubin, 1989, p. 108). The matrix is usually a metal board (copper, brass and zinc), and apart from the matrix material, the techniques differ in the incision procedure, which can be mechanical (engraving and dry needle) and chemical (etching and aquatint). The chemical incision of the painting into the matrix, so that the unprotected parts of the matrix are exposed to the corrosion caused by acids, gives various levels of grey surfaces until a full velvet black is obtained (Paro,

2002). In his description of graphic techniques, Jakubin (1989, p. 108) stated that differently from the high-end print where the graphics is expressed by lines and surfaces, the deep print expresses it by lines, tones and semi tones by which the illusion of volume and space is achieved. With the flat print techniques, the matrix printing the graphic sheet remains flat (Jakubin, 1989). The most popular are lithography and screen printing, while Paro (2002) added that the chemical process of fixing the art illustration on the matrix ensures the affinity of the illustration's drawn parts to the fatty components of the printing paint and their repulsion to humidity (...). The invention of photography, photocopies, and digital print offered the possibility of the truthful reproduction of reality, the existing drawings, paintings and texts (Smith & Holt, 2004). Whether graphics are an industrial (specific process of the text and painting multiplication for the transmission of information) or an artistic expression, it is important to mention an unavoidable element, this being the printing paint which is by its composition adapted to the demands of a certain graphic procedure, or a technique. Paro (2002) divided printing paints into two groups: black and colourful colours. The top printing technology demands have led to the complete degradation of the former beauty of black colours, manually applied during printing by manual presses (Paro, 2002). Imprinting is done by various machines: printing presses, silk sieve, the (photocopying) machine, etc. The machine conditions the largeness and format of the paper, while the graphic artist is the one to choose it according to its quality. In his *Graphic Manual* of 2002, Paro stated that the nature and character of the paper are read by graphic artists by their eyes, fingers and ears.

This paper will also consider some other techniques which, in the context of pedagogic art creation with preschool aged children, can be treated as part of the printing process. This is the monotype technique, for which the discussion was opened in professional circles about it even being a graphic technique or not, since the graphics precondition is the multiplicity of prints (Huzjak, n.d.). Despite that, Jakubin (1989) categorizes it in the flat print techniques where the picture or drawing is made using the brush on a completely flat surface, and then, by putting pressure, it is printed on paper. The frottage technique, the manual procedure of printing by rubbing the relief objects (Klein, 1977, p. 81) is classified by Klein and Paro (2002) as graphic technique despite the fact that the paint is not applied on the matrix, i.e. the relief surface, but to the back of the paper, laid on the relief surface, and rubbed with chalk, graphite, crayon or some other appropriate mean (Paro, 2002). Applying paint on a surface by a finger or fist print, considered by Karlavaris and his associates (1986, p. 26) the initial form of painting (smearing paint), is in this paper considered as a form of mechanical printing. The collage technique which, although part of painting techniques (Jakubin, 1989; Tanay, 1989) can also be considered as part of the graphic process of high-end print in the sense of working on the matrix by collaging, gluing thinner materials of various factures on cardboard (metal or plastic), which Paro (2002) calls collagraphy.

By studying the specialist literature of art pedagogy it can be deduced that there are numerous possibilities for the adaptation of complex information to children of an

early, preschool age. In the 1971 text *Graphics and Graphic Techniques*, Mijačević stated that graphics could be successfully done only with 7th and 8th grade pupils (Mijačević, 1971, p. 46), while Herceg, Rončević, and Karlavaris (2010) state the specificity of the graphic technique of cardboard printing which refers to the domination of working processes which could be one of the motives for Mijačević's (1971) opinion. Herceg, Rončević, and Karlavaris are of the opinion that solely applying paint on a surface and cutting the graphic matrix (...) represent working processes, so this phase also has to be understood and cherished in a certain way (Herceg, Rončević, & Karlavaris, 2010, p. 129). In his working material *Seminar for Preschool Teachers*, Belamarić (n.d.) is of the opinion that the *collage* technique is too difficult for preschool children, but that in its simplest forms it develops children's agility and working discipline. For younger children it includes tearing paper and sticking the pieces one by the other, while older children can cut the paper themselves into regular and irregular rectangular shapes and make lines (straight or curved) and other more complex lines and patterns. Thus, according to Karlavaris, Kelbl, and Kastor (1986), children get acquainted with the graphic techniques by elementary finger printing, crumpled paper, cardboard of various roughness, printing with different shapes and objects which can collect and print paint (leaf, feather, cork, various fruit, tree bark), which is continued by a partial intervention on these shapes by printing with a potato, cloth, lace and similar (Karlavaris, 1991). The aforementioned author also states that "the cardboard print, plaster cut, followed by linocut and leading to woodcut are simpler methods of high-end prints" (Karlavaris, 1991, p. 140). He follows by saying that it is rare to use the deep or flat print in schools.

It can be said that graphic procedures are good for the development of elaboration (Karlavaris, 1991, p. 117) and flexibility in the adaptation to the expected result, the print (refection of the picture, changes in colour compared to the matrix, etc.), the development of sensitivity to problems (for example, raster), originality and redefinition, which at the same time develop creativity. The use of graphic techniques develops motor skills, the fine sensitivity to the hand's various strength of pressure in the process of making the matrix and impression, while the process of imprinting deepens the tactile and visual understanding of the matter, material and texture. Along with analytical observation, graphics (...) "develops the sense of graphic stylization and the transposition of shapes in their graphic speech, speech of a black and white rhythm, surfaces, lines, dots, stains and other elements of graphic expression" (Jakubin, 1989, p. 114).

According to the Italian designer and art pedagogue Bruno Munari, graphic techniques need, and accordingly, develop thought processes based on reflexion, organisation of thoughts and ideas, and are expressed through practical manipulation linked to the reproduction of signs and shapes. In his master's thesis, in a text released in 2012, Falconi gives his detailed preparations for conducting workshops *Giocare con la stampa (Playing with Imprints)* according to which it is necessary to enable

each child to *project* the purpose of an individual's training to independently realise what is necessary in their lives through remembering certain information linked to the understanding of visual elements, and learning and exercising the technologies of material manipulation. According to Munari (as cited in Falconi, 2012), this can be achievable even in the preschool age by training children to observe everything that surrounds them, not superficially, through shape and colour, but by a more detailed observation of weight, lightness, softness, emptiness, foldedness, curvature, hairiness, etc. Munari thinks that by the study of graphic techniques with preschool aged children, processes significant for this age can be activated: getting to know the quality (material), then visual, tactile and work games, training of observation, as well as remembering information and basics of qualification (Falconi, 2012).

Playing with Art by Bruno Munari and Other Examples of Imprinting with Children

It is important to mention that at present there is not sufficient quality specialist literature on contemporary preschool art pedagogy in Croatia. Graphics is the least present in art pedagogy literature, so a larger number of positive practice examples relates to the neighbouring Italy. Nevertheless, the educators Borko, Batinić-Puškarčić, Vekić-Kljajić, and Jedrejčić (2011) have enriched this emptiness with their own practical examples, describing their practical experience in the use of high-end and flat printing techniques: collage print, monotype, seal print and impressing with Styrofoam plates. According to the authors (Borko et al., 2011, p. 25), graphics has shown to be very interesting to children, especially to those who show a tendency not only toward art activities, but those who like researching, trying, handling and using different materials in a creative game. Borko et al. (2011) have stated that in graphics there is a whole bunch of techniques easily adaptable to children's age, interests and possibilities.

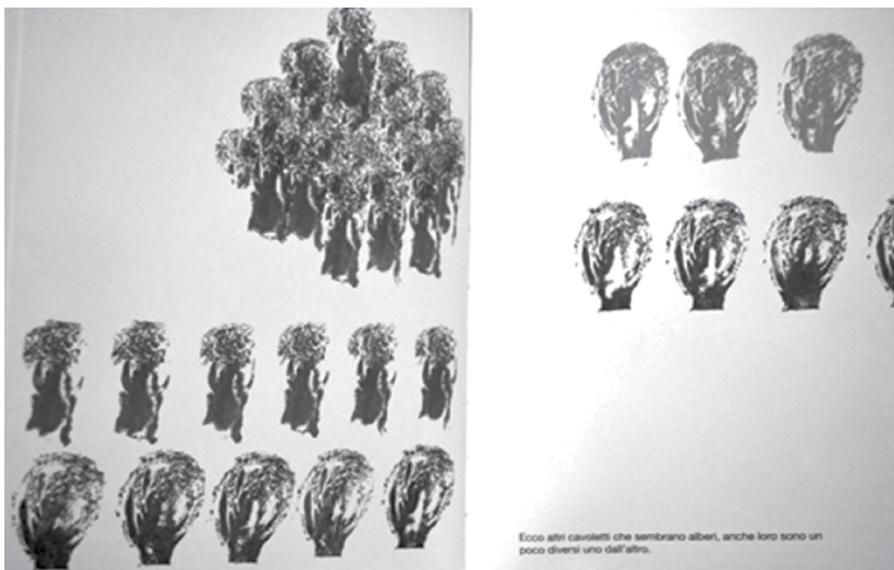
Cropley (2007) has stuck to the *basic* graphic techniques most usually intended for preschool-aged children (various objects imprinting, natural and artificial materials and the seal imprint with a potato), but has also introduced the photocopying machine which he usually used to create photocopies as the starting point for further creation. The only additional art activity was the augmentation of the parts of photocopies to obtain various raster forms with the purpose of further collaging, but not printing.

The designer and art pedagogue Bruno Munari has adapted and suggested to children a whole cycle of art activities named *Playing with Art*. Over a twenty-year period, they have developed in three cycles: *Visual Communication Workshops*, *Multi-sensor Workshops* and *Liberation Workshops* (Antonini, 2000). Antonini (2000) has described the Multi-Sensor Workshops including the research of ceramics, design, imprint, weaving, sound, wood, plastics, books, the sense of touch and Lego bricks activities. This paper describes only the activities linked to imprinting. Munari's interest in imprints was visible in his period of belonging to the futurists group from which he took over the idea about the importance of tactile experiences in everyday

life to, like Marinetti also stated in his manifest “Tactilism,” improve interpersonal understanding (Coen, 2009, p. 47).

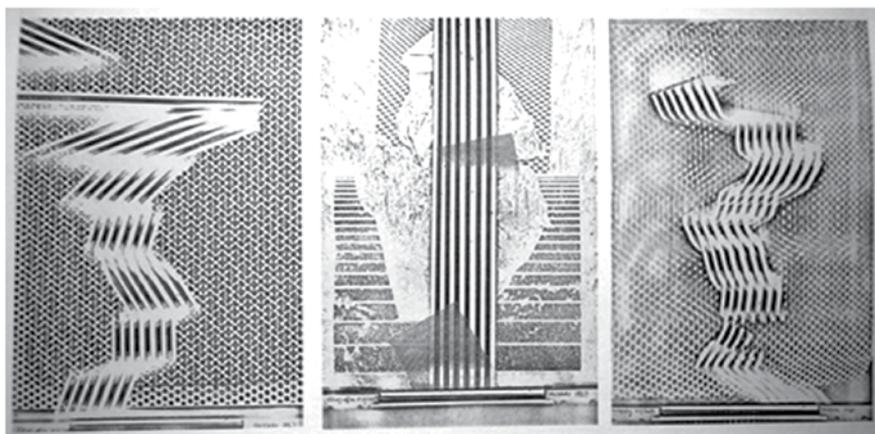
The workshop *Playing with Imprints* was held in the City Museum Imperia in Italy, in 1982 and led by Bruno Munari (Falconi, 2012; Nocchi Croccolo, 2010). Children themselves were able to choose a technique to research, and the ones offered were high-end prints (rubber seals and cardboard matrix), deep prints (zinc matrix), flat prints (based on the contrast between fat and non-fat matters (oil and water)) and techniques where the graphic paint goes through the matrix making an imprint like screen printing (Falconi, 2012). Children were thus acquainted with typography, lithography, screen printing, imprinting with stabbed cardboard seals and others (Munari, 2008, p. 149). Munari in particular (Falconi, 2012) has boldly offered and regulated the programme for children from the preschool age to the end of primary school.

Rose nell'insalata (*Roses in the Salad*) is a short Munari’s manual from the Workshop series which was first printed in 1974. Its purpose was not to be a technical course book, but a support to creative and free expression and, like in all Munari’s performances (artistic, as well as pedagogical), an encouragement to others in viewing everyday objects and occurrences from a different angle. Munari described clearly and fluidly the high print technical details and the possibility of imprinting fruit, and represented them in various composition relations. Putting imprints in line, grouping them, varying with colours and size was accompanied by imaginative associations by which the author unobtrusively stimulated the viewer (adult and child) to a more attentive analysis of the offered imprints.



Picture 1. Section of the book *Roses in the Salad* (Munari, 2010)

After his artistic experiments published under the title *Original Xerography* from 1972, in 1991 Munari suggested art activities with children by using the photocopying machine. Exceeding the possibility limits of the photocopying machine, the aim was to create originals, not photocopies (Falconi, 2012; Meneguzzo, 2000). Such contradictory expressions were very likeable to Munari and he succeeded in achieving them by moving the objects while photocopying them (Meneguzzo, 2000). During children's workshops Munari offered materials of different shapes and features compared to light: transparent, semi-transparent, reticular, and full. This artistic process is very simple in the technical sense. It is a matter of composing, collaging materials on the machine's photocopying surface, taking into consideration that the visible, imprinted, will be the lowest and turned downwards. The imprints were achromatic, while the simplicity and speed of production gave the child more imprints and offered the possibility of experimenting with materials, at the same time stimulating observation.

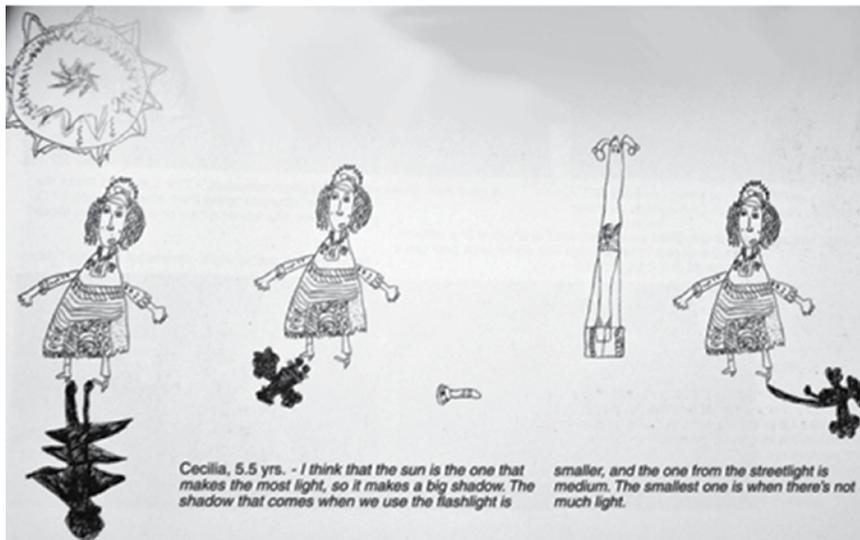


Picture 2. Original Xerography, 1966-1967, the Vodoz-Danese Collection, Milan (Finesi, 1999)

The imprint done by the photocopying machine opens new ways of research. With Munary and Cropley (2007) it was directed towards the study of raster. In the cycle *Playing with Art* (Munari, 1991) the author offered the surface character research by reproducing it on paper using pastels in the *frottage* technique. The offered materials gave raster of various intensities which leads us back to Munari's experiments with the photocopying machine Xerography (1972).

In 2010 the Italian art pedagogue Carrer suggested graphics correlated with paint and material (collage, monotype, high-end print with sponge and strings) in a paragraph of the manual *Educare all'Arte* (*Educate Art*). In that chapter paint is seen as matter, with the aim of understanding matter as something which does not exist in the function of form or object, but its internal possession of autonomy (Carrer, 2010, p. 81). To read into the art analysis of imprints, traces, objects (Carrer, 2010), special attention is paid to the importance of the author's hand pressure who, by doing this, imprints his or her gesture. According to Carrer (2010), this work form releases expression, makes possible

the instinctive elation to the matter and paint and arises curiosity and liberation from stereotypes. In the continuation of the manual *Educate Art* from 2010, a chapter named *Prelibri di Bruno Munary* by Astolfi is found, which says something about the huge influence which this art pedagogue and designer had on art pedagogy in Italy. This fact is confirmed by examples from city kindergartens from Reggio Emilia in which photocopies are used on a daily basis for creative creation, not as a surface later filled by children's colouring or additional drawings (Cropley, 2007), but as a photocopy of the personal drawing which offers children the possibility of varying drawings of a certain topic (Sturloni & Vecchi, 2000, p. 47). Besides, it is a very important fact that children are offered the possibility of researching imprints in a way adequate to them, so that they make the monotype matrix on various waterproof, plastic or watertight surfaces by drawing with ink, felt-tip pens and markers, and printing them on various papers, even on paper napkins (Vecchi & Ruoizzi, 2015).



Picture 3. Cecilia, 5.5, Reggio Emilia; Variation of the Theme of Light (Sturloni & Vecchi, 2000, p. 47)

In the Republic of Croatia there are no results or indicators of graphic techniques use by preschool-aged children due to the only recent affirmation of art pedagogy in the scientific area. The specialist sources (Borko et al., 2011) and the subjective knowledge of the preschool teaching practice give the impression of a very rare offer of graphic techniques in kindergartens. That is why the need for further research occurred.

The purpose of the research was to find out how much preschool teachers use graphic techniques in preschool practice, resulting in the following aims: 1st To examine to which extent female preschool teachers were familiar with graphic art techniques, 2nd To examine the extent to which graphic techniques were used in

working with children, 3rd To find out possible obstacles, according to the participants, in using graphic art techniques.

Research Methodology

Measuring Instruments and Research Participants

The measuring variables are: 1st The preschool teachers' knowledge of art graphic techniques, 2nd The frequency of use of the aforementioned techniques, 3rd Possible obstacles in the use of graphic art techniques. The questionnaire consists of 13 statements or questions which the participants answered according to the evaluation scale. The first variable is measured with a self-evaluation question from 1 (I am not at all familiar with it) to 4 (I know it very well); the second variable was measured by estimations: never, 1 to 3 times and 4 times and more; the third is measured by classification from 1 (none) to 3 (many). To fill the questionnaire clearly and quickly, drawings representing their significant characteristic were put near the name of graphic techniques groups, but only in its first part. The questionnaire had the average alpha reliability of = .6244. The data processing was done using the statistical program SPSS. The results processing was done by the descriptive analysis. There were N=35 female preschool teachers of the County of Istria taking part in the research.

Results

The research results show that all preschool teachers, N=35 (100%), have used graphic techniques in their work and that all, N=35 (100%), are planning to offer them to children in their future work with children. The other results have been given in tables and they show frequencies and percentages.

The research results shown in Table 1 lead to the conclusion that the female participants estimated their knowledge of flat print as very good (42.8%) and their familiarity with the deep print as non-existent (17.1%).

Table 1

The illustration of graphic techniques knowledge

	Not at all familiar with it		Little familiar		I know it well		I know it very well	
	F	%	F	%	F	%	f	%
High-end print	1	2.9	11	31.4	13	37.1	10	28.6
Deep print	6	17.1	17	48.6	10	28.6	2	5.7
Flat print	0	0	10	28.6	10	28.6	15	42.8
Digitalized print	3	9.1	12	36.4	8	24.2	10	30.3
TOTAL		7.2		36.3		29.7		26.8

The examined preschool teachers estimated that in the last two years the frequency of their use of the high-end print and flat print was: 4 and more times (38.2%), while the least frequency of use was shown for the deep print (82.4%) and digitalized print (79.4%).

Table 2

The illustration of the frequency of graphic techniques use

	0 (never)		1 to 3 times		4 and more than 4 times	
	F	%	F	%	F	%
High-end print	5	14.7	16	47.1	13	38.2
Deep print	28	82.4	5	14.7	1	2.9
Flat print	10	29.4	11	32.4	13	38.2
Digitalized print	27	79.4	1	2.9	6	17.6
TOTAL		51.6		24.2		24.2

One of the obstacles mostly estimated by female preschool teachers as serious is the lack of equipment (37.1%), while obstacles which were estimated as slightly serious are the technical complexity and the female preschool teachers' insufficient qualification (60%). Estimated as the least serious obstacle is the inadequacy to the child's preschool age (51.4%) and the lack of equipment in the facilities (44.1%).

Table 3

The illustration of the estimation of obstacles to the use of graphic techniques

	No		Slight		Serious	
	F	%	F	%	F	%
Technical complexity	9	25.7	21	60	5	14.3
Lack of equipment	7	20	15	42.9	13	37.1
Lack of equipment in the facilities	15	44.1	12	35.3	7	20.6
Preschool teachers' insufficient qualification	6	17.1	21	60	8	22.9
Inadequacy to the child's preschool age	18	51.4	16	45.7	1	2.9
TOTAL		31.6		48.8		19.4

Discussion

Research results shown in Table 1 lead to the conclusion that the participants estimate their knowledge of the flat print as very good (42.8%) and their knowledge of the high-end print as good (37.1%), which logically means that the best known techniques are the ones most frequently used (flat print 38.2% and high-end print 38.2%). However, the more frequent use of the mentioned techniques could be ascribed to its simplicity and availability. The flat print, which originates in painting (Huzjak, n.d.) is well familiar to female educators and children, and it thus simplifies the process of conceiving, preparation and creation. The pedagogical practice from Reggio Emilia gives an example of a premeditated process of making monotype matrices drawing with ink, felt-tip pens and markers on waterproof surfaces (Vecchi & Ruoizzi, 2015). The accidental mapping, *dirtying*, for example with markers, was transformed and offered to children with the aim of researching prints.

The deep print is the least known group of graphic techniques (17.1%), maybe due to the fact that the work on some techniques matrices is usually done with toxic materials in rooms where an adequate ventilation is necessary (Turković, 2008), so a larger number of the participants did not have a practical experience which they

could forward. However, new ways of graphic creation are introduced where in the applied methodology poisonous solvents and dangerous acids are not used, while the colours are water based with extremely good technical characteristics (Černeka, 2013), as stated by the leader of the graphic workshop, Černeka, during the festival Seven Days of Creation in Pazin.

Table 2 shows that the deep print techniques are the ones mostly not used, to the percentage of 82.4%, which is a confirmation of the statement given by Karlavaris, according to whom “the development of graphic expression is linked to the high-end print so that in the beginning the board is considered a drawing surface on which to draw or carve lines which will, during the imprint process, give white lines on a black background. The white lines form certain shapes which are partly processed in the following phase, so that white surfaces, black surfaces or surfaces of different textures or raster can be obtained. Only in the 7th grade can this process proceed to solutions which give black lines and differently processed surfaces” (Kalavaris, 1991, p. 140).

In the article *Graphic Techniques* (Borko et al., 2011, p. 27) the author says: “Although the deep print techniques are rarely applied in preschool institutions, this is a technique adequate and simplified for children, and it is possible to apply it in almost all groups. It is positive that non-formed material is used (Styrofoam obtained from various pads for groceries) and other materials and equipment usually known to children (tempera, brushes and sticks), but in a new way. It is possible to use the finished matrix more than once, and it can be processed if necessary.” However, it is to be remarked that the author, in the former explanation of the imprinting process of the same technique, which she classified as a deep print technique, has, in fact, described the high-end print technique, so this statement should refer to high-end print techniques. The terminological inequality in graphics is not surprising since the author of the *Graphics glossary*, Paro (2002, p. 2) himself, states in the foreword that “popular lexicons deal with its terminological particularity rarely and superficially. The history of the world’s graphic art has not been written yet as is not the history of many inventions which have helped the development of manual engraving and printing skills into electronically conducted and controlled processes of the graphic industry.” This is the reason why each noted and exchanged experience is precious and valuable, especially if researched with children at their earliest age.

Examples of high-end print can be found today in the form of finished objects meant for imprint, seals, so their availability and experience can increase children’s motivation and the teachers’ inspiration. The imprinting process can be achieved in a more creative way by the use of everyday life objects (Borko et al., 2011; Cropley, 2007; Munari, 2010). It is essential to develop preschool teachers’ sensibility for noticing art problems, and this could be encouraged by more regular quality pedagogical art workshops which would bridge the obstacle of the lack of equipment estimated by the participants in this research with the highest percentage (37.1%).

The participants have ranked the statements addressing the obstacles to the offer of graphic techniques very correctly and without the transfer of responsibilities (Table 3). It is very important, and this research has shown this, that graphic techniques are not considered inadequate to the preschool-aged child (51.4%) as it was in the 1970s (Mijačević, 1971). A change in the sole perception of children, their needs and the role of adults in their growth can be observed. This is confirmed by examples of practice from the Reggio kindergarten, which offers children various printing techniques for preschool-aged children. In the catalogue of the exhibition of children's works of art named *Mosaico di grafiche, parole, materia* (*Graphics, Words and Matter Mosaic*) from 2015 there are works by children aged three to five. The previously mentioned sources tell us that in Croatia the graphic techniques are offered to children from 3 to 7 years of age (Borko et al., 2011). This is achieved by adapting the techniques to preschool-aged children, so it can be assumed that the highest ranked obstacle, i.e. the lack of equipment (37.1%) will slowly be surpassed. In the mentioned Croatian example, the simplifications of the works done on the matrix are conducted by the use of the Styrofoam which is easily carved, as well as the cardboard matrix to which various materials of different textures and shapes are glued (Borko et al., 2011, p. 25). The works at the exhibition of children's works of art in Reggio Emilia (Vecchi & Ruoizzi, 2015) show graphics done by imprinting felt-tip pens or markers lines on various papers, even on a paper napkin, which is easily found in preschool institutions. From the point of view of art pedagogy, this suits the research and creative approach concentrated on the process, not the product, which is extremely important for the preschool age.

Conclusion

This preliminary research is a reference point for the state of the use of graphic art techniques with preschool-aged children with the purpose of obtaining data and directives for further analyses, both theoretical and practical. Since in fact there are no data or indicators of the graphic techniques frequency of use with children, it is important to have an insight into the current state and to be able to follow its development in the long run. It is certainly advisable to conduct this research on a larger sample and work on weaker items so as to improve the questionnaire's measuring characteristics. It would be interesting to compare the differences among the participants regarding their interests, years of working experience and place of work. The evaluation of knowledge, and the knowledge of graphic techniques can be measured in a different way, since the self-evaluation is subjective. Regarding all other art techniques, the graphic ones seem to be the most complex, the least known and present in preschool institutions, so it is possible that some participants are familiar with the technique, but do not know its name (or vice versa, as shown in the analysis of presented experiences in Croatia). To obtain as truthful a picture of the state of matters as possible, a picture describing a certain technique was added to the questionnaire

of this research thus accompanying the mentioned graphic technique, while the work with female participants was conducted by the authors directly, with comprehension and with all of them in the same way.

The result showing that today graphic techniques are considered adequate for preschool-aged children is significant, because it means that the old obstacles to their use are being overcome. In spite of all, a certain repulsion at the choice of printing for art creativity in kindergartens is still felt. However, these results relate only to the conducted research and cannot be applied to the whole Croatian preschool teachers' population, but it was shown that it would be significant for art pedagogy and art to spread this research.

The results of this research show the necessity and importance of additional education on the topic of applying graphic techniques with preschool-aged children, while the presented artistic experiences prove the lightness and simplicity in its application. It practically means that introducing preschool teachers to Munari's work through professional training could make a contribution to creating new viewpoints on everyday occurrences and thus enrich children and the teaching practice. His pedagogical experience reflects a freshness in handling the printing equipment, adapted to children's hands, but also to their needs of expressing themselves and playing, thus releasing the free individual.

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Upotreba grafičkih tehnika s djecom predškolske dobi

Sažetak

U ovom se radu iznosi kratak pregled grafičkih tehnika i pregled njihova razvoja. U radu su izneseni primjeri dobre prakse, posebice pedagoškoga rada talijanskog dizajnera i pedagoga Bruna Munarija koji je na vrlo kreativan i tehnički jednostavan način ponudio djeci stvaranje otiskivanjem kako mehanički tako i digitalno upotrebom fotokopirnog stroja. Naglasak je na analizi rezultata preliminarnog istraživanja u kojem se anketiranjem 35 odgojiteljica iz nekoliko predškolskih ustanova Istarske županije došlo do informacija o procjeni poznavanja, učestalosti upotrebe i eventualnih prepreka u ponudi grafičkih tehnika. Za potrebe istraživanja osmišljen je upitnik kojim se procjenjuje u kojoj mjeri odgojiteljice Istarske županije nude djeci grafičke tehnike za likovno stvaranje. Rezultati pokazuju kako anketirane odgajateljice procjenjuju malo i dobro poznavanje grafičkih tehnika, od kojih se najviše koriste tehnikom visokog i plošnog tiska, a najmanje dubokim i digitaliziranim tiskom. Prema procjeni odgojiteljica predložene prepreke nemaju veliki značaj, pa se najveći postotak odnosi na tehničku složenost kao malu prepreku ponudi grafičkih tehnika. Rezultati pokazuju kako se likovnim usavršavanjem odgojiteljica u smjeru prilagodbe i pojednostavljenja dobi djece predškolske dobi može povećati učestalost ponude pa samim time značajno obogatiti dječje stvaralačke procese.

Ključne riječi: Bruno Munari; likovna predškolska pedagogija; mehaničko i digitalno otiskivanje.