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THE RELATION BETWEEN STUDENT MOOD AND HANDICRAFTS IN THE CONSTRUCTIVIST CLASSROOM

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Abstract/Povzetek The purpose of this paper is to emphasize the importance of handicrafts from the perspective of various pedagogical perspectives. Although the findings of numerous researchers support the positive effects of handicrafts, those teaching methods are rarely used in school either. The empirical section of this paper aimed to explore the relation between student mood after performing a handicraft assignment and attitudes towards the assignment. A total of 16 students between the ages of 11 and 12 were sampled from the same classroom in order to conduct this preliminary study. All the students had previous experience with sewing, which was taught to them by their teacher, with whom they have been working on various handicraft activities since the first grade of elementary school. An anonymous survey was created and administered to the participants. The results of this study suggest that handiwork in the classroom has potential implications for improving the students' mood and creating a positive learning environment.

Keywords:
constructivism;
handicrafts;
mood;
sewing.

Ključne besede:
konstruktivizem;
ročno delo;
razpoloženje;
šivanje.

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Odnos med razpoloženjem učencev in ročnimi deli v konstruktivističnem pouku

Namen članka je poudariti pomen ročnih del z vidika različnih pedagoških perspektiv. Čeprav ugotovitve številnih raziskovalcev podpirajo pozitivne učinke ročnega dela, se te metode poučevanja v šoli redko uporabljajo. Cilj empiričnega dela tega članka je bil povezati razmerje med razpoloženjem učencev po izvajanju naloge iz ročnega dela ter njihova stališča do te naloge. Za izvedbo preliminarne študije je bilo v vzorec iz istega razreda skupaj zajetih 16 učencev v starosti 11 ali 12 let. Vsi učenci so imeli predhodne izkušnje s šivanjem, ki ga jih je poučeval njihov učitelj, s katerim so na različnih dejavnostih ročnih del delali od prvega razreda osnovne šole. Oblikovana je bila anonimna anketa in izvedena z udeleženci. Rezultati te študije kažejo, da ima ročno delo pri pouku možne učinke na izboljšanje razpoloženja učencev in ustvarjanje pozitivnega učnega okolja.

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Introduction

Contemporary educational paradigms emphasize the importance of student-centered teaching, which is consistent with the constructivist theory in education (Fosnot & Perry, 2006; Pritchard & Woollard, 2010; von Glasersfeld, 1989, 1995, 2001). Palekčić (2002) and Babić (2007) define the constructivist approach to teaching as a constructive and situational process that focuses on providing support, encouragement and counseling to students. Furthermore, this approach emphasizes the importance of individual growth during interactions with the external, physical environment, as well as with internal, innate processes. One of the fundamental postulates of constructivist theory is the definition of knowledge as an individual construct, so there are different perceptions of reality and multiple truths (Duffy & Cunningham, 1996; Duffy & Jonassen, 1992). According to Babić (2007), that postulate has significant implications for education because learning is an active process that constructs knowledge, and during that process, teachers must support students and consider the errors they make along the way as positive outcomes because these provide teachers with insight into the students' experiential world. The contemporary perspective on teaching, which supports individualized teaching and attempts to fulfill the needs of all children in order to help them feel successful, also emphasizes that intellectual achievements in school are not the only, absolute measures of success. Matijević (2017) considers Gardner's theory of multiple intelligences as the key for defining the concept of success in pedagogy (Gardner, 1983). That theory has also been adopted by didactic theories and contemporary teaching practices (Armstrong, 2006). According to Turković (2009), Gardner's theory called for increasing attention to individual characteristics of students in education because some students learn better with visual materials, whereas others might prefer auditory or written materials, and schools should allow them equal opportunities to develop their abilities. Schools that implement the theory of multiple intelligences in practice are dedicated to developing their students' understanding, and they encourage students to use their knowledge for solving problems and performing the tasks they face in their local communities, while striving to activate each student's unique combination of intelligences and assess their development accordingly (Gardner 1993, as cited in Armstrong 2006). Student-centered education is also supported by findings from the field of neuroscience: learning through research and problem solving, situational and experiential learning, project-based learning, cooperative learning, activity-based learning, and learning by playing are innate learning mechanisms (Lawson, 2003, as cited in Velički & Topolovčan, 2017).

That is why the objectives of classroom activities should include the development of various competences, skills, and abilities that will be useful to students for living and working in contemporary society and direct them toward a path of lifelong learning. To achieve these objectives, practical work is essential because different approaches to learning have positive effects on different aspects of development, including motor, intellectual and emotional growth. The value and appreciation of practical work and handicrafts in the classroom have been changing over time, and those activities are now, in Croatian elementary schools, almost completely neglected and marginalized (Matijević, 2001) because some practice-based subjects have been canceled (e.g., shop class and home economics), while the time allocated to others has been minimized, as is true for visual arts, music (Turković, 2009), and nature and society. However, the Finnish education system, as one of the most advanced education systems in the world, assigns great importance to crafts and handiwork, and various scientists (Autio, 2016; Garber, 2002; Pöllänen, 2013a, 2013b; Pöllänen, 2015a, 2015b) emphasize the advantages of handiwork not just for children and students, but for the general population as well. Pöllänen (2012, 2013a, 2013b, 2015a, 2015b) conducted several studies on a sample of subjects between 16 and 84 years of age and found that doing handicrafts reduces stress and calms the mind, has positive effects on health because of its recreational component, increases satisfaction, promotes optimism, creates positive connections and support systems, and helps people deal with negative emotions. The aforementioned studies define handicrafts as a multidisciplinary phenomenon that needs to be encouraged during elementary education, and whose effects on education outcomes should be researched. The seminal work of Komensky, Rousseau and Pestalozzi, as well as more recent work by Steiner, Freinet and Montessori in the 20th century, emphasizes the importance of handicrafts in education. Pestalozzi conceptualized the three dimensions of learning: the intellectual dimension related to the head, the moral dimension related to the heart and the physical dimension related to the hands (Kuhlemann & Brühlmeier, 2002). Therefore, handicrafts, as an essential part of arts and trade schools, forms one of the dimensions of learning. Learning through activity is especially important for children because they learn best by touching and moving and through sensing and experience, so preschool and primary school are the periods during which learning is best conducted with physical activities (Centofanti, 2002). Handicrafts as a method of learning by working with the hands is supported by the followers of Rudolf Steiner, Maria Montessori and Celestine Freinet (Acker, 2007; Carlgren, 1991; Matijević, 2001). Waldorf schools, which follow the pedagogical concept of success for all, use arts and physical labor as a counterbalance to intellectual education. Art education consists of various activities – singing, playing recorders,

eurhythmics, drawing, drama and theater plays – while physical labor is introduced in subjects such as crafts, woodwork, gardening and handiwork, which is a mandatory subject starting from the first grade and teaches students knitting, crocheting, embroidering, felting, and sewing by hand or with a machine (Carlgren, 1990). Maria Montessori emphasized persistence, coordination, concentration, freedom of choice, order and innate motivation through handiwork and practical exercises (Philipps, 2003). Over the past few decades, neuroscientists have also been studying the importance of handicrafts. The skills associated with handicraft are connected with motor skills. Motor skills encompass all skills associated with actions involving movement and the ensuing results of those actions (Newell, 1991). One example is learning to play a musical instrument. Various authors consider that learning to play a musical instrument during childhood supports cognitive development and increases skill even in non-music related disciplines (Bangerter & Heath, 2004; Hyde et al., 2009; Wan & Schlaug, 2010). Early dance education can also develop skills that are transferable to cognitive disciplines (Petitto, 2008). Furthermore, performance-based art forms (music, drama and dance) increase focus and memory because they are taught through rehearsal and repetition, and those skills are then transferred to other memory-related cognitive skills (Jonides, 2008). Various authors (Huotilainen, 2013; Steele et al., 2013) have found that a higher number of repetitive movements causes structural change in the brain. Wan and Schlaug (2010) confirmed the same findings regarding repetition while practicing instruments, whereas Hyde et al. (2009) reported that 15 months of music education in early childhood can significantly alter the brain as a result of practical work, since those changes cannot be explained by biological factors alone. Therefore, learning new skills alters not only our physical brain, but our sense of self, as well (Marchand, 2008). Autio (2016) found that students, boys and girls alike, are highly-motivated to work with their hands; they are attracted to trade schools, enjoy working with their hands and enjoy the independence and creative expression opportunities that this teaching approach gives them (Silverman & Pritchard, 1996). Likewise, students who enroll in technical schools are attracted to projects that will engage them (Weber & Custer, 2005). Marchand (2008) argues that practical knowledge needs to be valued not just because of productivity or the role of skills in the economy, but because practical knowledge is an important determinant of satisfaction in personal and professional life. Garber (2002) notes the relationship between handiwork and brain development, so the physical dimension of learning must not be “lost in the education system” (p. 142), and future studies should investigate the hierarchy of valuation of that which children learn in schools based on what is important for life and work. It is important to mention that handiwork in the context of trade education provides an experience that is an alternative to

consumerism and materialism. Pöllänen (2013a, 2013b) demonstrates that crafts provide tools that can prevent cultural decline. According to that study, people who create with their hands (i.e., trade workers) are less susceptible to consumerism, focus their life on friends and family, and live a fulfilled life, so handiwork in the future could promote sustainable development because it helps individuals understand the ecological consequences of their actions. Despite many studies, the findings of neuroscientists, the postulates of the theory of multiple intelligences, the numerous pedagogical concepts that emphasize the importance of handiwork, and the fact that handiwork is beneficial not just for the children involved but also for the entire society, this approach to learning is underrepresented in Croatian elementary education. According to Bereiter and Scardamalia (2003), teachers should focus their teaching efforts on preparing students for lifelong learning and the production of creative innovations, which would require adoption of the constructivist approach to teaching and student-centered learning. The purpose of this preliminary study was to examine the relation between the students' mood after completing their handicraft assignment and their attitudes associated with the assignment at hand.

Methods

Participants

A total of 16 elementary school students between 11 and 12 years of age, 7 males and 9 females, participated in this study. All participants had previous experience with sewing, but only two students had learned to sew at home or in kindergarten, while the rest learned to sew in school. The students represent a specific group because they have been learning various handicraft activities from their teacher, such as sewing and embroidery, since the first grade, even though those activities are extracurricular. Given the unique nature of the lesson plan for those students in comparison to their peers in other classes and schools, this study used a convenience sampling strategy.

Data Collection

An anonymous survey was designed to measure (using a 5-point Likert scale) the students' attitudes about a handiwork assignment, which was to sew a horse on a stick to be used as a prop in a school play. The props were later sold at the school fair. This kind of activity takes more time than most similar activities, such as drawing or painting in visual arts. It is possible to define the activity as project-based learning, which in this case requires persistence, engagement and concentration, but the students are also motivated because their work will have an application. The

scale consisted of 28 items, which measured four independent variables and one dependent variable. The composite variable *Low self-efficacy* was measured with 11 items assessing their self-efficacy (e.g., “I didn’t believe I would be able to complete the assignment”); need for help with the assignment (e.g., “I needed help from a friend in my group”); and the need for validation upon completion (e.g., “I needed a compliment when I was done with the assignment”). The consistency of the scale was considered to be good (Cronbach's $\alpha = 0.89$). The variable *Positive Attitude* refers to the students’ beliefs in their ability to complete the assignment (e.g., “My persistence was helpful”), their attitude about the task in general (e.g., “I liked the assignment”) and the creation process (e.g., “I was in a good mood during the assignment”). This subscale consisted of 6 items and had an acceptable level of internal consistency (Cronbach's $\alpha = 0.63$). The composite variable *Outcome* consists of four variables that measure attitudes about the outcomes of their assignment, that is the attitude towards the importance of the activity for their growth (e.g., “I believe that sewing and puppet making are important skills”) and the importance of what other people think about their product (e.g., “My parents’ opinions about my product are important to me”). The subscale had a good level of internal consistency (Cronbach's $\alpha = 0.87$). The composite variable *Changing attitude* consists of five variables that measure how the students’ attitude changes as they start working on the assignment. Although some students were uncertain of their ability to complete the assignment, their attitude could change at the beginning of the assignment (e.g., “The assignment became easier when I started working on it”) or at any point during their assignment (e.g., “When I saw the form of my product coming together, I no longer feared failure”). The internal reliability of this subscale was good (Cronbach's $\alpha = 0.84$). The variable *Mood* was measured with one item in the questionnaire: “I was in a good mood when the assignment was over.”

Results and Discussion

The results of the descriptive statistics are shown in Table 1.

Table 1. *Descriptive statistics by variable.*

Variable	n	Mean	St. Dev.	Median	Min	Max	Skew	Kurtosis
Low self-efficacy	16	3.26	1.09	3.27	1.18	4.46	-0.58	-1.08
Positive attitude	16	4.49	0.45	4.67	3.50	5.00	-0.70	-0.62
Outcome	16	3.93	1.22	4.25	1.00	5.00	-0.91	-0.30
Changing attitude	16	4.32	0.81	4.80	2.60	5.00	-0.93	-0.56
Mood	16	4.87	0.35	5.00	4.00	5.00	-1.95	1.93

The mean difference between the independent variables and the dependent variables, as well as the normality of the distribution of differences between them, is presented in Table 2. Normally distributed data was analyzed using a paired sample t-test because the t-distribution solves the problem of accurately estimating standard error in small samples as long as the variables follow a normal distribution (Diez, Barr, & Çetinkaya-Rundel, 2015). Non-parametric data was analyzed using the Wilcoxon signed rank test as an alternative to the paired sample t-test because non-parametric tests are better than parametric tests for analyzing non-normal data obtained from small samples (Sullivan, 2017).

Table 2. Mean difference and normality test result of the differences between the independent variables and the dependent variable.

Variable	Mean difference	95% CI (lower, upper)	K-S	p
Low self-efficacy	-1.61	-2.21, -1.01	0.24	0.02
Positive attitude	-0.38	-0.63, -0.13	0.21	0.09
Outcome	-0.93	-1.59, -0.27	0.22	0.06
Changing attitude	-0.55	-0.99, -0.10	0.27	0.005

According to the comparison of the mean differences listed in Table 2, the students' mood after the assignment was significantly higher compared to the variables *Low self-efficacy*, $W = 120$, $p = 0.001$, *Positive attitude*, $t = 3.21$, $p = 0.006$, *Outcome*, $t = 3.03$, $p = 0.009$, and *Changing attitude*, $W = 51$, $p = 0.019$. Because this test was conducted using a paired sample, the results indicate that each individual student evaluates their mood as significantly higher than they evaluate their attitudes about the handiwork assignment they completed. These results are consistent with the findings from other authors who have investigated the effects of handiwork on mood (Autio, 2016; Silverman & Pritchard, 1996). Those studies found that handiwork had a profound effect on students, as they enjoy that type of work because it makes them feel fulfilled and allows them the freedom of creative expression. Handiwork promotes a positive mood and environment, which is one goal of a constructivist teaching approach that focuses on creating an environment where students are free to express themselves; it also fulfills the students' needs by providing them with support, encouragement and counseling (Palekčić, 2002; Babić, 2007). These results can also be associated with alternative schools that include handiwork in their official curriculum because of its importance for the holistic development of students. Pöllänen (2012, 2013a, 2013b, 2015a, 2015b) also confirms the positive effects of handiwork on satisfaction, optimism and the

formation of positive relationships and support networks. A weak positive correlation was found between the students' mood and low self-efficacy, but it was not statistically significant, $r = 0.25$, $p = 0.37$. Moderate, but non-significant, positive correlations were also observed between the students' mood and the following variables: *Positive attitude*, $r = 0.41$, $p = 0.12$, *Outcome*, $r = 0.32$, $p = 0.24$, and *Changing attitude*, $r = 0.33$, $p = 0.24$. Although these results are not statistically significant, the correlations are positive, and it is important to note that the strongest correlation observed was the one between the students' mood and their *Positive attitude*, which measures the students' beliefs regarding their ability to complete the assignment because of their persistence and skill. The association between the students' mood and the composite variable *Outcome* implies that students find the product of their work important, but they are also concerned with what others (i.e., parents, teacher and friends) will think about their work. Since the *Outcome* variable represents a combination of intrinsic (i.e., innate) and extrinsic (e.g., physical environment, parents, teacher and friends) factors that contribute to a better mood, the positive relationship between the two variables can be associated with the postulates of constructivist approaches to teaching, which aim to improve the environment in order to facilitate social development, learning, creation and holistic individual development (Babić, 2007; Duffy & Cunningham, 1996; Palekčić, 2002). The association between the students' mood and their *Changing attitude* is also positive, which would suggest that the students' mood after the activity improves as the sense of insecurity decreases. According to Marchand (2008), learning new skills changes our sense of self. In other words, from the perspective of modern constructivism, it is important to encourage students to feel successful in a range of activities, not just based on the intellectual achievements that are usually evaluated in schools.

Conclusion

In the context of the contemporary constructivist approach to education, it is important to consider the different approaches that facilitate students' holistic development (i.e., cognitive, emotional, and motor). This paper focuses on considerations about the importance of practical work, handicraft, which is almost completely neglected and marginalized in elementary schools. The purpose of this preliminary study was to investigate the relation between the students' mood after completing a handicraft assignment and their attitudes about that handiwork assignment. The results showed that students rate their mood significantly higher than any other variable measured in this study, including *Low self-efficacy* (participants' beliefs in their ability to succeed at the assignment), *Positive attitude* (the strong belief by the participants in their own ability to complete the assignment and

their attitudes about the assignment and work in general), *Outcome* (attitude about the importance of the activity for their growth and the importance of what other people think about their product), and *Changing attitude* (despite initial insecurities, the participants can change their attitudes and belief in their skills as they start working on the assignment). Although correlations between the variables were non-significant and weak or moderate, all correlation coefficients were positive, so the mood of students after participating in a handicraft task is expected to increase along with their confidence in their own skill and their satisfaction with the topic and their final product. Considering the low strength of the correlations observed and the low sample size characteristic of preliminary studies, it is not possible to make general inferences, which means that any generalizations based on these findings should be made with extreme caution.

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UPORABA PROSTORSKIH KLJUČEV PRI UČENCIH OSMEGA RAZREDA OSNOVNE ŠOLE

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Povzetek/Abstract V članku se ukvarjamo s specifičnim problemom, ki ga je mogoče zaznati pri urah likovne umetnosti v osmem in devetem razredu osnovne šole pri artikulaciji prostora na ploskvi z uporabo prostorskih ključev. Izkušnje kažejo, da učenci znanja o prostorskih ključih, ki ga usvojijo, kasneje v drugih likovnih nalogah pogosto ne izkažejo več. Ta problem smo podrobneje osvetlili z izvedbo kvalitativne raziskave pri 28 učencih osmega razreda osnovne šole, v kateri smo proučevali, kako učenci že naučeno znanje o prostorskih ključih uporabijo tudi v likovnih nalogah, pri katerih uporaba prostorskih ključev od njih ni eksplicitno zahtevana. Ena izmed ključnih ugotovitev raziskave je, da kar dve tretjini učencev v drugi risbi ni uporabilo znanja o prostorskih ključih, čeprav so ga izkazali v prvi risbi. To razkriva, da učenje prostorskih ključev, ki poteka zgolj nekaj ur pri predmetu likovna umetnost, ne vodi do tega, da bi učenci to znanje ponotranjili do te mere, da bi ga lahko spontano uporabljali.

The Usage of Visual Gradients at Eighth-graders In the article, we address an issue that can be observed in art lessons in the eighth and ninth grades of primary school in Slovenia. This issue is related to the ability to articulate the illusion of space in drawing by the use of visual gradients. Experience has shown that even though pupils have acquired knowledge of visual gradients, they fail to apply this knowledge in subsequent similar drawing tasks. Therefore, we performed a qualitative research study during art lessons in which we sought to analyse how eighth-graders (a sample of 28 pupils), once given the knowledge of visual gradients, use this knowledge in subsequent drawing assignments in which there is no explicit demand for the use of visual gradients. One of the key findings based on the results is that two-thirds of pupils did not apply their knowledge of visual gradients in the second drawing (despite showing it in first drawing). This reveals to us that a single exposure to visual gradients does not lead pupils to internalise the knowledge of visual gradients or to use it spontaneously.

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Uvod

»Razvoj prostorskega dojemanja je eden najpomembnejših ciljev likovne vzgoje« (Tomšič Čerkez, 2011, str. 31). Na tem spoznanju temelji tudi Učni načrt za likovno umetnost v osnovni šoli (Kocjančič idr., 2011). Duh in Vrlič (2003) utemeljmeta pomembnost razvijanja učenčevega razumevanja prostora z dejstvom, da ni poklicnega področja, na katerem ne bi bile potrebne razvite prostorske predstave. Ker je sposobnost dojemanja vizualnega prostora tesno povezana s sposobnostjo likovne artikulacije tega prostora, je tudi v učnem načrtu pri predmetu likovna umetnost v osmem razredu osnovne šole v okviru oblikovanja na ploskvi predvideno obravnavanje vsebine o upodabljanju iluzije prostora. Ko učitelj spremlja učence pri pouku likovne umetnosti, lahko prepozna določene ponavljajoče se vzorce v njihovem likovnem izražanju. Nekateri so presenetljivi, druge pa je mogoče razložiti in utemeljiti na osnovi že raziskanih dejstev o otrokovem splošnem ali pa specifičnem razvoju, kot je na primer likovni. Eno takšnih zanimivih dejstev je mogoče opaziti pri učencih v osmem razredu in je povezano z obravnavanjem vsebine o prostorskih ključih. Učenci to vsebino dobro usvojijo, kar večina uspešno izkaže v lastnem likovnem delu, vendar pa v kasnejših likovnih delih tega znanja ne uporabijo več ali pa ga le pomanjkljivo. Zato smo se natančneje poglobili v ta problem in poskušali to opažanje podkrepiti z raziskavo, v kateri smo zasledovali uspešnost uporabe prostorskih ključev v risbah učencev, prepričljivost artikulacije prostora na ploskvi v risbah in stopnjo v likovnem razvoju posameznika, s čimer je povezana tudi likovna kompozicija.

Teoretična izhodišča

Prostorski ključ in zaznavne konstance

»Človek zaznava prostor s štirimi čuti: vidom, sluhom, tipom in kinestetično občutljivostjo. Od teh je najpomembnejši vid« (Pečjak, 2006, str. 65). Trstenjak (1978) pravi, da je človek »vidno« bitje, ker se pri orientaciji v prostoru najbolj zanaša na vid. Realni prostor, ki ga definirajo tri razsežnosti, je prostor, v katerem se gibljemo, zaznavamo predmete, njihove oblike in medprostor med njimi (Butina, 1997). Človek zaradi ustroja za to odgovornih organov brez težav obvladuje telo in se zato lahko orientira v prostoru, seveda ob predpostavki, da je zdrav. Izhajajoč iz dveh, za človeka temeljnih smeri – vertikalnosti človeškega telesa v stoječem položaju in horizontalnosti v ležečem položaju – lahko opredelimo tri navidezne, med seboj pravokotne ravnine: frontalna ravnina deli prostor na spredaj in zadaj, medialna na levo in desno, očesna pa na zgoraj in spodaj. To so ravnine prostorskega križa, ki je strukturirana oblika človekovega psihološkega prostora

(Butina, 1997). Prostor definirajo odnosi med predmeti, torej tudi odnosi med človekom kot opazovalcem in predmeti. Človek je v več pogledih ključni element tega prostora, saj vzpostavlja fizične odnose s predmeti v prostoru, ga čustveno doživlja in v njem vzpostavljene odnose osmišlja (Butina, 2000). Realni prostor je za človeka skupaj z nepregledno množico predmetov mnogoterih oblik, velikosti, barv in tekstur izziv za likovno upodabljanje tako v prostoru kot na ploskvi. Likovni prostor izhaja iz t. i. naravno danega prostora oz. vizualnega psihološkega prostora, kot ga zaznava človek s pomočjo vidnega aparata na zavedni in nezavedni ravni (Muhovič, 2015). Tudi Butina (2000) pravi, da likovni prostor temelji na principih, po katerih človek zaznava in tudi dojema realni prostor. Bistvo problema upodabljanja realnega prostora na dvodimenzionalni ploskvi je, da se realni prostor od likovne ploskve razlikuje za eno dimenzijo. Tretjo dimenzijo lahko ustvarimo le navidezno, s pomočjo t. i. prostorskih ključev oz. globinskih vodil, zato je takšen prostor iluzija prostora. Prostorski ključi ali globinska vodila v zaznavi omogočajo izkušnjo globine, v likovnosti pa omogočajo artikulacijo iluzije globine na slikovni ploskvi (Butina, 1995). Po eni strani torej označujejo psihofiziološke temelje zaznavanja globine realnega prostora, hkrati pa tudi oblikotvorne temelje gradnje navidezne globine prostora na dvodimenzionalni površini. V praksi sicer ločujemo veliko različnih prostorskih ključev (npr. konvergenca linij, osvetljenost in osenčenost, delno prekrivanje oblik z oblikami, različna ostrina obrisov in detajlov glede na razdaljo, stopnjevanje velikosti, diferenciacija barvne intenzitete in njihove kombinacije ipd.), vendar pa je mogoče vse v osnovi kategorizirati v tri temeljne skupine: prostorski ključi na temelju prekrivanja, zvrčanja in stopnjevanja. Te tri skupine prostorskih ključev temeljijo na ključnem zaznavnem pojavu, t. i. zaznavnih konstancah (Gillam, 2000; Sternberg, 2006; Kuroda, 1971; Garrigan in Kellman, 2008). Pogoj za mladostnikovo razumevanje in uporabo prostorskih ključev je torej ustrezen razvoj zavesti o zaznavnih konstancah. Značilno za pojav zaznavnih konstanc je, da možgani na osnovi pridobljenih izkušenj v zaznavi ohranijo posamezne lastnosti pojmov in predmetov, tudi če pride do izrazitih sprememb v dražljajskih okoliščinah (Muhovič, 2015). Preprosto rečeno: kljub temu da se oblike lahko v prostoru prekrivajo, zvrčajo ali stopnjujejo (po velikosti, barvi ipd.), ostajajo v naši zaznavi stabilne in konstantne, zato naša zaznava tolmači njihovo navidezno spreminjanje kot spremembo njihove prostorske orientacije in položaja. Vrste zaznavne konstance je toliko, kot je lastnosti oblik oz. likovnih spremenljivk. Rački (2010) na primer navaja konstanco barve (Foster, 2011), oblike (Sternberg, 2006), položaja (Goolkasian in Bojko, 2001), svetlosti (MacEvoy in Paradiso, 2001) in velikosti (Carlson, 2010). Za risanje je še posebej pomembna konstanca oblike, saj omogoča, da npr. kocko prepoznamo kot kocko, čeprav se nam nikoli ne kaže kot skupek kvadratov, temveč kot skupek trapezov (prav tam). Zaznavne konstance

niso človekova prirojena značilnost, pač pa poteka njihov razvoj zlagoma s pridobivanjem izkušenj in razvojem pojmovanja (če od rojstva slepemu povrnemo sposobnost gledanja, sprva ne bo še ničesar zares videl, ker se morajo zaznavne konstance v njegovi vidni zaznavi šele vzpostaviti) (Pečjak, 2006). Fenomen zaznavne konstance človeku ekonomizira življenje, ker omogoča stabilnost v njegovih zaznavah, saj se lastnosti fizikalnih dražljajev, ki jim je človek ves čas izpostavljen, ne prestopajo. Butina (1997) zato pravi, da so to zaznavni procesi, ki nam omogočajo, »da lahko sploh mislimo in spoznavamo svet, in predmeti v njem morajo ohranjati svoje značilnosti, da jih lahko povežemo s pomeni in jih tako spremenimo v pojme« (str. 78).

Likovna sintaksa in likovni jezik

Z likovnim prostorom je neločljivo povezana tudi likovna kompozicija, tako v procesu zaznavanja kot tudi v likovni artikulaciji. Ker sintaksa likovnega prostora in sintaksa likovne kompozicije temeljita na vzpostavljanju odnosov med oblikami ter med oblikami in formatom, vplivata druga na drugo. Posledično so tudi prostorski ključji, s katerimi prikažemo iluzijo globine prostora, povezani s kompozicijskimi principi. Likovni prostor in likovna kompozicija sta del sintaktične ravni likovnega jezika. Vsak jezik ima komunikacijsko, spoznavno in ustvarjalno funkcijo. Tako tudi likovni jezik v komunikacijskem smislu najprej služi kot sredstvo komunikacije ustvarjalca s samim seboj in nato tudi z okolico, v spoznavnem smislu predstavlja sredstvo za spoznavanje vidnega sveta ter v poetičnem smislu (gr. poiein – ustvarjati) sredstvo za ustvarjanje novega likovnega sveta. Tako kot v besednem jeziku so te funkcije tudi v likovnem jeziku mogoče na osnovi sistema pravil – slovnice – ki omogoča artikulacijo in interpretacijo likovnega jezika (Selan, 2014). Likovni jezik torej artikulira odnose v prostoru na likovnojezikovnih ravneh: fotološki, morfološki, sintaktični in semantični. Posebna specifičnost likovnega jezika se pri tem kaže prav na sintaktični ravni, ki je, za razliko od sintakse besednega jezika, dvonivojska – hkrati poteka na dveh podravneh, na ravni sintakse likovnega prostora in na ravni sintakse likovne kompozicije. Ko namreč likovnik razporeja oblike v iluzijo prostora, jih hkrati razporeja tudi po površini slikovne ploskve. In obratno, ko jih razporeja po površini formata, jih hkrati ureja tudi v globino prostora. Gradnjo likovne kompozicije omogočajo kompozicijski principi, gradnjo likovnega prostora pa prostorski ključji, oboji pa so med seboj neločljivo prepleteni (Selan, 2013). Sintaktična raven likovnega jezika torej zajema strategije, ki opredeljujejo, kako oblike hkrati prepričljivo gradijo likovni prostor in hkrati tvorijo tudi likovno kompozicijo.

Likovni jezik in likovni razvoj

Tako kot se zaznavne konstance lahko vzpostavijo le skozi postopno izkušnjo, tako se otrok tudi sposobnosti likovne artikulacije prostora ne more zgolj naučiti, pač pa jo mora v procesu postopne likovne izkušnje in likovnega razvoja ponotranjiti. Razumevanje likovnosti kot jezikovnega pojava na to še posebej opozarja. »Namen učenja likovnega jezika je aktivirati sposobnost, da človek spontano razvije generativno gramatiko, ki mu omogoča spoznavanje, poetično izražanje in razumevanje v likovnem jeziku. Likovna kompetenca je torej sposobnost, ki omogoča, da zna nekdo generirati in interpretirati likovni izraz na vsaki izmed ravni generativne gramatike likovnega jezika ter se s tem v likovnem jeziku izražati in ga razumeti« (Selan, 2014, str. 378). Tako kot pri izražanju v besednem jeziku se posameznik tudi v likovnem jeziku obstoja pravil nujno niti ne zaveda, a se kljub temu lahko spontano in suvereno izraža, če je likovno gramatiko med procesom razvoja likovne jezikovne izkušnje v procesu likovnega udejstvovanja ponotranjil. Spontano ponotranjanje likovnega jezika se pri otroku začne s prvo čačko v zgodnjem otroštvu. Kasneje se spontanemu učenju likovnega jezika pridruži še namensko učenje, ki ga je z odraščanjem vedno več, spontanega pa vedno manj. Otrok se likovnega jezika hitro uči, če le ima možnost kontinuirane likovne aktivnosti in je deležen ustrezne spodbude skozi vse otroštvo. Ponotranjanje likovnega jezika je za otroka pomembno z več vidikov: s pomočjo risbe ozavešči vsa nova odkritja iz vidnega sveta; s spoznavanjem zakonitosti prostora ponotranji zakonitosti zaznavnih konstanc, na katerih temelji razumevanje prostorskih ključev; likovni jezik za otroka služi kot orodje za komunikacijo s samim seboj in drugimi; omogoča tudi razvoj analitičnega in sintetičnega mišljenja (Selan, 2014). Sposobnost uporabe prostorskih ključev in artikulacije prostora na ploskvi pri mladostnikih je mogoče najbolje spremljati na področju risbe. Vsakega izmed nas spremlja risba že od zgodnjega otroštva (Rački, 2010), saj je likovno izražanje potreba vsakega otroka (Pečjak, 2006). Risanje je pomemben segment človekovega duševnega in telesnega razvoja (Rački, 2010). Likovno izražanje otroka se razvija pod vplivom vzporednih procesov dozorevanja in učenja, ki so med seboj odvisni, vsak pa ima tudi svoje zakonitosti. Rezultat teh procesov so spremembe v telesnem, psihomotoričnem, kognitivnem, emocionalnem in socialnem razvoju otroka (Duh in Vrlič, 2003; Karlavaris in Berce Golob, 1991). Otrok pri likovnem izražanju v likovni izdelek vnaša svoje interese, želje, pričakovanja in tudi strahove (Pečjak, 2006). Ker temelji likovno izražanje na prostoru in prostorskih odnosih, je najpomembnejši segment pri ponotranjanju likovnega jezika prav razvoj artikulacije likovnega prostora (Selan, 2014) in likovne kompozicije, ki se v vsaki razvojni fazi otroške risbe kaže v specifičnem načinu vzpostavljanja odnosov med oblikami ter med oblikami in formatom. Likovni razvoj otroka poteka skozi določene standardne faze, ki jih

navajajo najrazličnejši avtorji (Piaget in Inhelder, 1956; Karlavaris in Berce Golob, 1991; Matthews, 1992; Duh in Vrlič, 2003; Grgurić in Jakubin, 1996; Cox, 2005; Freeman, 1980; Jolley, 2010; Lowenfeld in Brittain, 1987; Luquet, 1913, 1927; Strauss, 2007; Tanay, 1988; Thomas in Silk, 1990; Waber in Holmes, 1985; Wenham, 2003; Marjanovič Umek, 2011; Marjanovič Umek in Zupančič, 2004).

Ko v otrokovem likovnem razvoju ena razvojna faza mine, nova spoznanja spremenijo njegov način upodabljanja prostora (Frelj, 2012). Pri tem je zelo pomembna spodbuda okolja (staršev, vzgojiteljev, učiteljev), vendar ne na način, da se otroka sili v prehitro prehajanje skozi faze razvoja, pač pa na način spodbujanja, da otrok v posamezni razvojni fazi likovno artikulacijo čim bolj poglobi (Selan, 2014). Tudi prikazovanje prostora v risbi sledi določenim zakonitostim, ki so vezane na razvoj in starost otroka (Golomb, 1992). Prikazovanje prostora sprva temelji na otrokovih predstavah o tem, kar upodablja, in ne le na tem, kar vidi, zato otrok v risbo pogosto vključi tudi tisto, česar na predmetu ni. Med devetim in enajstim letom preidejo otroci na razvojno stopnjo, ki jim omogoča vzpostaviti zavest o zaznavnih konstancah in jim pri prikazovanju prostora omogoča upoštevanje perspektive, razporejanje elementov glede na njihove medsebojne odnose in usklajevanje različnih pogledov (Golomb, 1992). V tem obdobju dozorevanja zato želi večina otrok v risbi prikazati globino prostora (Matthews, 2003). Pri upodabljanju predmetov uporabljajo poševno projekcijo, ukvarjajo pa se tudi že s prikazovanjem volumna s pomočjo senčenja (Berce Golob, 1993). Karlavaris in Berce Golob (1991) zato pravita, da je razvijanje prikazovanja prostora pri učencih treba spremljati in spodbujati brez pretiranega usmerjanja, saj so šele po dvanajstem letu sposobni uporabiti postopek perspektivnega risanja.

Metoda

Opredelitev problema in cilj raziskave

Otroci med devetim in enajstim letom preidejo na razvojno stopnjo, ki jim omogoča razviti ustrezno zavest o zaznavnih konstancah, te pa so predpogoj za razumevanje prostorskih ključev (Golomb, 1992). Zato je učna vsebina o upodabljanju iluzije prostora s pomočjo prostorskih ključev po učnem načrtu za osnovno šolo smiselno umeščena v osmi razred (Kocjančič idr., 2011). Toda izkušnje kažejo, da učenci znanja o prostorskih ključih, ki ga usvojijo pri učnih urah likovne umetnosti, kasneje v podobnih likovnih nalogah ne izkažejo več. Ta problem smo zato želeli podrobneje raziskati z izvedbo kvalitativne raziskave med učenci osmega razreda osnovne šole. Zastavili smo si tri raziskovalna vprašanja:

RV1: Prvo je vezano na trajnost in ponotranjenost znanja o prostorskih ključih: Ali in kako učenci že naučeno znanje o prostorskih ključih uporabijo

tudi v likovnih nalogah, pri katerih uporaba prostorskih ključev ni eksplicitno zahtevana?

RV2: Drugo je vezano na sposobnost in skladnost utemeljitve učencev, katere prostorske ključne mislijo, da so uporabili, katere pa so tudi zares uporabili: Ali se utemeljitve učencev glede uporabe prostorskih ključev skladajo z njihovo dejansko uporabo?

RV3: Tretje je vezano na kompleksnost in celovitost likovne artikulacije prostora: Ali učenci, ki v risbi uporabijo več prostorskih ključev, tudi izkažejo bolj celovito artikulacijo likovnega prostora?

Vzorec

Vzorec je bil neslučajnostni namenski in zajema dva oddelka učencev osmega razreda osnovne šole ene izmed ljubljanskih osnovnih šol. Od 38 učencev je obe za analizo potrebni risbi izdelalo 28 učencev.

Postopki pridobivanja podatkov

Izvedli smo kvalitativno raziskavo, ki je potekala v dveh stopnjah. Nastale risbe so v raziskavi predstavljale glavni vir podatkov za analiziranje. Prva dejavnost je bila učna ura, pri kateri smo učence poučevali o prostorskih ključih. V prvi likovni nalogi, v kateri so učenci upodobili iluzijo prostora z uporabo prostorskih ključev, so imeli za izhodišče slovensko ljudsko bajko o nastanku Blejskega jezera. Na osnovi vsebine so si poljubno izbrali motiv. Risali so s tušem in trsko na gladko stran risalnega lista formata A3. Pri prvi likovni nalogi so morali uporabiti vsaj štiri različne prostorske ključne. Odločili so se lahko za konvergenco linij, delno prekrivanje, odsebnost, stopnjevanje velikosti, diferenciacijo obrisov in detajlov, nizanje ravnin drugo nad drugo, obvezno pa so morali uporabiti grafično modelacijo. Med likovnim izražanjem smo z učenci komunicirali, jih spodbujali in po potrebi dodatno razložili morebitne nejasnosti. Učenci so na koncu na vsak izdelek napisali, katere prostorske ključne so v posamezni risbi uporabili. Po preteku treh mesecev so pri drugi dejavnosti učenci dobili novo likovno nalogo na področju risanja – izbirali so lahko med naslovoma Sprehod po domišljajski pokrajini in Piknik v Tivoliju, risali pa so s svinčnikom na pisarniški papir formata A4. Za razliko od prve naloge učencev nismo posebej spodbujali k uporabi prostorskih ključev, saj smo želeli ugotoviti njihovo spontano uporabo; delali so povsem samostojno. Po koncu so učenci na risbo zopet zapisali, katere prostorske ključne so uporabili.

Postopki obdelave podatkov

V dveh korakih raziskave je vsak od 28 učencev izdelal dve risbi. Skupno 56 izdelkov smo nato ocenili trije ocenjevalci: magistrica profesorica poučevanja likovne pedagogike, univerzitetni profesor likovne teorije ter univerzitetni profesor risanja in slikanja. Dva ocenjevalca imata bogate izkušnje iz preizkusov likovne nadarjenosti na univerzitetni ravni ter iz sodelovanja v najrazličnejših komisijah za ocenjevanje likovnih del otrok (natečaji, bienala ipd.). Likovne izdelke smo ocenili na dva načina, kvantitativno in kvalitativno: po eni strani smo šteli uporabljene prostorske ključve in jih točkovali (vsak uporabljen prostorski ključ smo ovrednotili z eno točko). Po drugi strani pa smo ocenjevali celovito uspešnost artikulacije likovnega prostora v risbi (uspešna ali neuspešna artikulacija prostora). Pri tem smo upoštevali likovnojezikovne kriterije za ugotavljanje kompleksnosti likovnih izdelkov učencev (Pičnik, Podobnik in Selan, 2017). Izdelke smo analizirali in primerjali glede na posameznega učenca. Pridobljene podatke smo deskriptivno statistično obdelali. Zaradi majhnosti vzorca ugotovitve veljajo za proučevani primer.

Rezultati*Raziskovalno vprašanje 1*

Likovna analiza risb iz prvega koraka raziskave je pokazala, da je 19 učencev, kar je 70 % oz. dve tretjini celotnega vzorca, v risbah prikazalo vsaj štiri prostorske ključve. Po preteku treh mesecev se je pri drugi likovni nalogi v drugem koraku raziskave pokazalo, da je takih učencev precej manj, le 10, kar je 36 % oz. le dobra tretjina vzorca. Koliko prostorskih ključev so učenci uporabili v prvi in drugi risbi, je razvidno iz tabele 1, uporabo posameznega prostorskega ključva v obeh risbah pa prikazuje tabela 2.

Tabela 1: Število učencev (absolutna in relativna frekvenca), ki je v prvi in drugi risbi uporabilo od 0 do 7 prostorskih ključev

Št. prostor. ključev	0	1	2	3	4	5	6	7	
Prva risba	N	0	0	2	7	6	8	3	2
N = 28	%	0	0	7	25	21	29	11	7
Druga risba	N	1	6	7	4	6	1	3	0
N = 28	%	4	21	25	14	21	4	11	0

Tabela 2: Pogostost (absolutna in relativna frekvenca) uporabe posameznega prostorskega ključa v prvi in drugi risbi

Prostorski ključi	UČENKE N = 17 Risba 1		UČENKE N = 17 Risba 2		UČENCI N = 11 Risba 1		UČENCI N = 11 Risba 2		SKUPAJ N = 28 Risba 1		SKUPAJ N = 28 Risba 2	
	N	%	N	%	N	%	N	%	N	%	N	%
Konvergenca linij	7	41	5	29	2	18	5	45,5	9	32	10	36
Prekrivanje	16	94	14	82	9	82	7	64	25	89	21	75
Grafična modelacija	14	82	4	23,5	5	45,5	2	18	19	68	6	21
Senca	9	53	4	23,5	5	45,5	1	9	14	50	5	18
Stopnjevanje velikosti	14	82	10	59	9	82	5	45,5	23	82	15	54
Jasnost obrisov in detajlov	8	47	2	12	3	27	4	36	11	39	6	21
Nizanje ravnin	14	82	9	53	7	64	6	54,5	21	75	15	54

V tabeli 2 so zbrani podatki o tem, koliko učenk in koliko učencev je uporabilo posamezni prostorski ključ v prvi in v drugi risbi. Navedene so tudi skupne vrednosti za učenke in učence. V celotnem vzorcu jih je največ uporabilo prostorski ključ prekrivanje oblik – pri prvi risbi 89 %, pri drugi pa 75 %, kar kaže, da so učenci in učenke ta prostorski ključ razumeli in ga tudi ozavestili. Drugi najpogosteje uporabljen prostorski ključ je pri obojih stopnjevanje velikosti; pri prvi risbi ga je uporabilo 82 %, pri drugi pa 54 % vseh učencev in učenk. Zelo podobno razmerje je tudi pri nizanju ravnin drugo nad drugo – 75 % vseh ga je uporabilo v prvi, 54 % pa v drugi risbi. Največja razlika med prvo in drugo risbo je ugotovljena pri grafični modelaciji – v prvi risbi jo je uporabilo 68 % učencev in učenk, v drugi pa le 21 %. To kaže na slabše poznavanje tega globinskega vodila in se sklada z ugotovitvami raziskav, da se senčenje pojavi šele v kasnejšem obdobju otrokovega likovnega razvoja (Matthews, 1999). Precejšnja razlika je tudi pri uporabi odsebnice sence, saj jo je v prvi risbi upodobila le polovica učencev in učenk, v drugi pa slaba petina. V prvi risbi je bila najmanjkrat uporabljena konvergenca linij (32 %), v drugi pa odsebna senca (18 %). Zanimiva je tudi primerjava rezultatov po spolu, ki pri prvi risbi pokaže, da so učenke večino prostorskih ključev uporabile večkrat kot učenci, razen stopnjevanja velikosti, ki so ga uporabili oboji enako (82 %). Pri prvi risbi je razlika največja pri grafični modelaciji (učenke 82 %, učenci 45,5 %), pri drugi risbi pa so ta prostorski ključ tako učenke kot učenci slabše uporabili (učenke 23,5 %, učenci 18 %). V drugi risbi so učenci večkrat kot učenke uporabili konvergenco linij (učenci 45,5 %, učenke 29 %) in diferenciacijo jakosti obrisov in detajlov (učenci 36 %, učenke 12 %), učenke pa so bile bolj kot učenci dosledne pri prekrivanju elementov (učenke 82 %, učenci 64 %), nekoliko bolje pa so tudi stopnjevale velikost.

Raziskovalno vprašanje 2

Kot utemeljitev uporabe prostorskih ključev pri vrednotenju izdelkov so učenci na vsak izdelek napisali, katere prostorske ključve so v posamezni risbi uporabili. V tabeli 3 so zbrani podatki o tem, koliko učenek in koliko učencev je pri vrednotenju utemeljilo uporabo posameznega prostorskega ključva v prvi in v drugi risbi. Hkrati so navedene tudi skupne vrednosti za učenke in učence.

Tabela 3: Pogostost utemeljitve (absolutna in relativna frekvenca) uporabe prostorskih ključev pri vrednotenju prvih in drugih risb

Prostorski ključvi	UČENKE N = 17 Risba 1		UČENKE N = 17 Risba 2		UČENCI N = 11 Risba 1		UČENCI N = 11 Risba 2		SKUPAJ N = 28 Risba 1		SKUPAJ N = 28 Risba 2	
	N	%	N	%	N	%	N	%	N	%	N	%
Konvergenca linij	14	82	2	12	2	18	2	18	16	57	4	14
Prekrivanje	14	82	10	59	6	54,5	4	36	20	71	14	50
Grafična modelacija	15	88	1	6	4	36	2	18	19	68	3	11
Senca	10	59	2	12	3	27	2	18	13	46	4	14
Stopnjevanje velikosti	10	59	4	23,5	5	45,5	1	9	15	54	5	18
Jasnost obr. in detajlov	10	59	2	12	2	18	0	0	12	43	2	7
Nizanje ravnin	2	12	2	12	1	9	0	0	3	11	2	7

Pri prvi risbi pri učenkah najbolj odstopajo navedbe pri konvergenca linij – navedlo jo je 82 % učenek, uporabilo pa pol manj – in pri nizanju ravnin drugo nad drugo, kjer pa so precej nižje navedbe (12 %) od v risbah uporabljenega (82 %). Pri učencih je največja razlika nastala pri nizanju ravnin drugo nad drugo, saj jih je le 9 % ta ključ utemeljilo, uporabilo pa ga je 64 % učencev. Precej manjkrat, kot so dejansko uporabili globinsko vodilo, so ga navedli še v primeru prekrivanja in stopnjevanja velikosti. Delež teh odstopanj gotovo odpade na nedosledno upoštevanje navodila glede navedbe uporabljenih prostorskih ključev, ki so ga učenke bolj upoštevale kot učenci. Pri drugi risbi je očitno, da so zaradi preteka daljšega časa od obravnavanja te vsebine učenci pozabili izraze za posamezni prostorski ključ; glede na uporabljene prostorske ključve so jih navajali zelo pomanjkljivo. Pri tem so bile učenke vseeno nekoliko bolj vestne in so si pomagale z zapisom v zvezku.

Raziskovalno vprašanje 3

Pri kvalitativni presoji celovite gradnje prostora v risbah učencev smo na podlagi pregledovanja, razčlenjevanja in primerjanja izdelkov formirali tri kategorije: zelo uspešna, zadovoljiva in neuspešna artikulacija prostora. Zelo uspešna pomeni

prepričljivo upodobitev prostora, ki daje vtis celovitosti. Zadovoljiva artikulacija prostora pomeni, da je v risbi mogoče zaznati tretjo dimenzijo, neuspešna artikulacija pa je opredelitev za neprepričljiv vtis globine in za ploskovitost risbe, torej odsotnost navidezne tretje dimenzije. V skupino uspešnih smo nato razvrstili tako učence in učence, ki so zelo uspešno artikulirali prostor, kot tudi tiste, ki so prostor artikulirali zadovoljivo.

Tabela 4: Pogostost (absolutna in relativna frekvenca) uspešne in neuspešne artikulacije prostora v prvi in drugi risbi

	Uspešna artikulacija prostora		Neuspešna artikulacija prostora	
	N	%	N	%
Prva risba	14	50	14	50
Druga risba	11	39	17	61
Prva in druga risba	3	9	4	14

Iz tabele 4 je razvidno, da je z vidika artikulacije navideznega prostora v prvi risbi iluzijo prostora uspešno upodobilo 14 učencev in učenk, kar je 50 % oz. polovica vzorca, v drugi risbi pa le 11 učencev in učenk, kar predstavlja le 39 % oz. dve petini vzorca. Iz tretje vrstice je razvidno, koliko učencev in učenk je bilo pri obeh risbah uspešnih in koliko jih je imelo v obeh izrazite težave pri tvorbi globine prostora.

Tabela 5: Število (absolutna in relativna frekvenca) uporabljenih prostorskih ključev pri učenkah in učencih, ki so uspešno/ neuspešno artikulirali prostor

Artikulacija Prostora		Število uporabljenih prostorskih ključev								
		0	1	2	3	4	5	6	7	
Uspešna (risba 1) N = 14	N	0	0	0	0	3	7	2	2	
	%	0	0	0	0	21	50	14	14	
Neuspešna (risba 1) N = 14	N	0	0	2	7	3	1	1	0	
	%	0	0	14	50	21	7	7	0	
Uspešna (risba 2) N = 11	N	0	0	0	1	5	2	3	0	
	%	0	0	0	9	45	18	27	0	
Neuspešna (risba 2) N = 17	N	1	7	6	2	1	0	0	0	
	%	6	41	35	12	6	0	0	0	
Uspešna (obe risbi) N = 3	Risba 1	N	0	0	0	0	0	1	1	1
		%	0	0	0	0	0	33	33	33
	Risba 2	N	0	0	0	0	0	0	3	0
		%	0	0	0	0	0	0	100	0
Neuspešna (obe risbi) N = 4	Risba 1	N	0	0	1	2	1	0	0	0
		%	0	0	25	50	25	0	0	0
	Risba 2	N	1	3	0	0	0	0	0	0
		%	25	75	0	0	0	0	0	0

Iz tabele 5 je razvidno, koliko prostorskih ključev so uporabili učenci, ki so uspešno artikulirali prostor, in koliko učenci, ki pri tem niso bili uspešni. Ugotovimo lahko, da je število uporabljenih prostorskih ključev povezano z uspešnostjo celovite, prepričljive gradnje prostora, saj so tisti učenci, ki so dobro upodobili tretjo dimenzijo, v povprečju uporabili tudi več prostorskih ključev ($M = 5,2$) kot tisti, ki so bili pri gradnji prostora neuspešni ($M = 3,4$). Ta razlika je po pričakovanju še bolj opazna ob primerjavi v obeh risbah izrazito uspešne in izrazito neuspešne artikulacije prostora.

Primerjava obeh risb posameznega učenca pokaže, da so v obeh risbah iluzijo prostora suvereno prikazali le trije, kar je razvidno iz primera št. 1 (sliki 1 in 2).

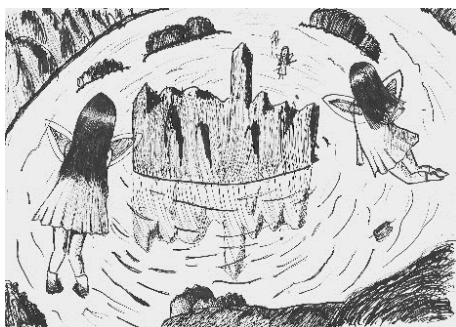


Slika 1: Primer št. 1 (prva risba) – dobro artikuliran navidezni prostor

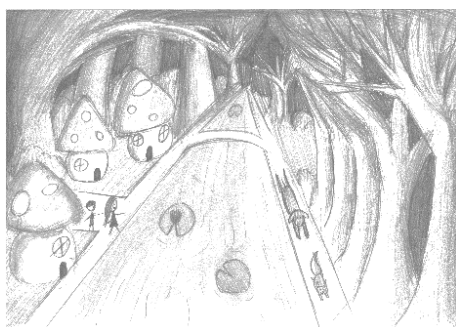


Slika 2: Primer št. 1 (druga risba) – dobro artikuliran navidezni prostor

Osem učencev je v drugi risbi bolj upodobilo navidezni prostor kot v prvi, od tega trije nekoliko boljše, pet pa precej boljše, kot kaže primer št. 2 (sliki 3 in 4). Za te učence je bila verjetno ključna okoliščina, da posebnih navodil za izvedbo druge risbe ni bilo, zato niso bili obremenjeni z definiranjem in izvedbo določenega števila prostorskih ključev. To pomeni, da imajo ti učenci vsaj do neke mere ponotranjeno zavest o artikulaciji prostora. Seveda je mogoč razlog tudi motiv, ki jim je na prvi pogled ponujal več svobode, k sproščenosti izvedbe pa je gotovo prispevala tudi tehnika risanja s svinčnikom, ki jo učenci radi uporabljajo in so je bolj vajeni kot tuša in trske.

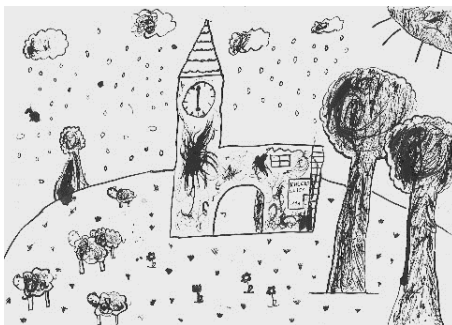


Slika 3: Primer št. 2 (prva risba) – slabše artikuliran navidezni prostor



Slika 4: Primer št. 2 (druga risba) – dobro artikuliran navidezni prostor

Primer št. 3 (sliki 5 in 6) je od enega od štirih učencev, ki so imeli pri obeh risbah velike težave pri upodabljanju iluzije prostora. Poleg umanjkanja prostorskega dojemanja odnosov in posledično razumevanja in uporabe prostorskih ključev kot temeljnega načina gradnje prostorske iluzije je pri teh posameznikih očitna bodisi izrazita negotovost pri likovnem izražanju bodisi nezainteresiranost za katero koli likovno področje.

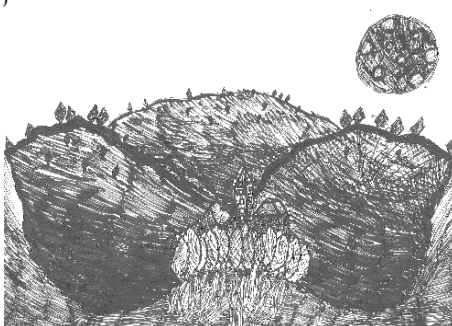


Slika 5: Primer št. 3 (prva risba) – zelo slabo artikuliran navidezni prostor

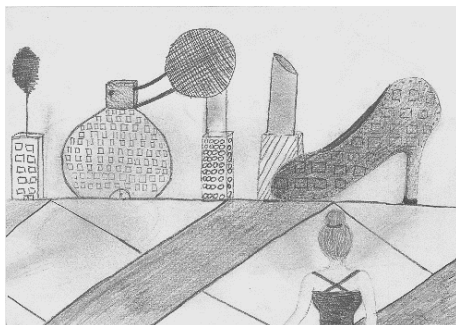


Slika 6: Primer št. 3 (druga risba) – zelo slabo artikuliran navidezni prostor

Za raziskavo najpomembnejši podatek je, da je trinajst učenk in učencev, kar je skoraj polovica vzorca, iluzijo prostora v prvi risbi prikazalo bolje kot v drugi. Primer št. 4 (sliki 7 in 8) razkriva, kako velika je pri tem lahko razlika v prostorski kompleksnosti med prvo in drugo risbo. Pri teh učencih je očitno, da so v prvem koraku raziskave s pomočjo usvojenega znanja o prostorskih ključih v prvi risbi sicer zadovoljivo upodobili navidezni prostor, toda njihova druga risba dokazuje, da teh načel likovnega jezika niso ponotranjili, zato niso tudi spontano artikulirali prostora, ko se to od njih ni zahtevalo.



Slika 7: Primer št. 4 (prva risba) – dobro artikuliran navidezni prostor



Slika 8: Primer št. 4 (druga risba) – slabše artikuliran navidezni prostor

Interpretacija

Ponotranjenost in celovitost znanja o likovnem prostoru

S proučitvijo in analizo uporabe prostorskih ključev v likovnih delih učencev smo dobili precej izčrpne podatke za interpretacijo glede na izhodiščni problem in cilj raziskave ter na zastavljena raziskovalna vprašanja. Zaradi majhnosti vzorca rezultati sicer veljajo le za obravnavani vzorec, vendar pa se je na osnovi dobljenih podatkov slika o problemu kljub temu precej razjasnila in odprla kompleksno problematiko, ki je povezana z naravo likovnega jezika oz., specifično, likovne sintakse. V raziskavi smo uspešno uporabo prostorskih ključev v risbah učencev merili na eni strani tako, da smo šteli prisotnost posameznih prostorskih ključev (tabeli 1 in 2). Poleg tega pa so tudi učenci na risbe zapisali, katere prostorske ključje mislijo, da so uporabili v risbi. S tem smo dobili podatke za prvo (RV1) in drugo raziskovalno vprašanje (RV2). V odnosu do RV1 se je izkazalo, da se je uporaba prostorskih ključev po treh mesecih precej zmanjšala – v risbah v drugem koraku raziskave smo namreč našli precej manj uporabljenih prostorskih ključev kot v risbah iz prvega koraka raziskave. V odnosu do RV2 pa smo ugotovili dvoje. Da so učenci za kakšen prostorski ključ večkrat zapisali, da so ga uporabili, čeprav ga niso (ter obratno, da so kakšnega v resnici uporabili, pa ga niso zapisali), ter da se je v drugem koraku prav tako bistveno zmanjšalo število zapisanih prostorskih ključev. To kaže, da se sposobnost uporabe prostorskih ključev le deloma pokriva z njihovim teoretičnim zavedanjem, kar nakazuje, da teoretično zavedanje načel likovnega jezika ne pomeni nujno uspešne uporabe teh načel, ter obratno, da nezavedanje nekaterih načel ne pomeni nujno, da teh načel nekdo ne zna uporabljati. Podobno kot velja za vsak jezik, velja torej tudi za likovni jezik. Jezikovna načela je treba ponotranjiti (zato lahko postanejo nezavedna), ne pa se jih zgolj teoretično zavedati. Prav zaradi te ugotovitve se je ob »štetju« prostorskih ključev v risbah učencev razkril naslednji bistveni problem, ki je povezan s tretjim raziskovalnim vprašanjem (RV3) in vpliva tudi na prvo raziskovalno vprašanje

(RV1). Štetje posameznih prostorskih ključev in presojanje njihove skladnosti z zapisi učencev o tem, kateri prostorski ključ so uporabili, daje vpogled v usvajanje konkretne vsebine, torej posamičnih prostorskih ključev, ne pa tudi vpogleda v to, kako so uporabljeni prostorski ključi prepleteni z ostalimi načeli likovne artikulacije v kompleksno prostorsko in kompozicijsko celoto. Zato smo v risbah presojali tudi likovno celovitost in uspešno artikulacijo likovnega prostora v risbi kot celoti (tabeli 4 in 5). Šele ta celovitost je tista, ki nakazuje razliko, ki je za likovno izražanje bistvena, namreč razliko med poznavanjem posameznih prostorskih ključev kot izoliranih likovnojezikovnih načel in njihovim ponotranjenjem znotraj likovnega jezika. Skratka: to, da učenec pozna in zna uporabiti posamezen prostorski ključ kot samostojen princip, je podobno, kot da zna v besednem jeziku spregati ali sklanjati glagol ali samostalnik. Ko se učimo tujega jezika, se spreganja in sklanjanja sicer lahko zelo dobro naučimo, toda če tega procesa ne bomo ponotranjili kot dela širše jezikovne celote, ga ne bomo znali spontano in konsistentno uporabljati v jezikovni praksi, in torej jezika pravzaprav sploh ne bomo znali. Podobno je tudi s prostorskimi ključi (in vsemi likovnojezikovnimi principi). Primeri učencev, ki so v prvem koraku izkazali relativno dobro znanje o prostorskih ključih, v drugem pa ne, kažejo na to, da so v prvem koraku prostorske ključne sicer uporabili navidezno pravilno, vendar ne skladno z ostalimi prostorskimi ključi in nekonsistentno povezano v likovno celoto. Zato se tudi znanje o teh prostorskih ključih pri teh učencih ni ponotranjilo, torej prepletlo z ostalimi likovnojezikovnimi načeli v celovito likovno sposobnost. Posledično ti učenci principov gradnje likovnega prostora niso uporabili spontano v drugem koraku raziskave, ko tega od njih nismo zahtevali in ko se tega niso več »učili«. Primerjava tabel 1 in 4 nam torej pove, da čeprav je več kot štiri prostorske ključne v prvi risbi uporabilo 19 učencev, jih je bilo pri celoviti gradnji prostora uspešnih 14. In čeprav je v drugi risbi več kot štiri prostorske ključne uporabilo 10 učencev, jih je bilo pri tem uspešnih 11. To pomeni, da neka korelacija med številom uporabljenih prostorskih ključev in uspešno artikulacijo prostora sicer obstaja (trije učenci, ki so bili uspešni v obeh risbah, so uporabili več kot pet prostorskih ključev), vendar pa sama količina uporabe prostorskih ključev še ni nujno odraz uspešne in celovite gradnje likovnega prostora.

Likovni razvoj kot razvoj likovnega jezika

Dodatni problem se razkrije, če ob presoji problema sposobnosti uporabe prostorskih ključev upoštevamo tudi likovni razvoj učencev, kakor se kaže v pridobljenih risbah. Stanje, ki se pri tem razkrije, je prav pereče. Pri tej starosti bi morali namreč vsi učenci že kazati izrazito sposobnost spontane uporabe vsaj nekaterih prostorskih ključev, npr. prekrivanja in stopnjevanja velikosti. To

razvojno stopnjo lahko ugotovimo ob sliki 9, kaže pa se v sproščenosti, spontanosti, predvsem pa v konsistentnosti upodobitve prostora. Da pri nekaterih učencih zavest o likovnem prostoru pri tej starosti še ni vzpostavljena do ravni, ki bi jim omogočala spontano in uspešno artikulacijo prostora, dokazuje slika 10, v kateri so oblike razporejene linearno, večinoma po načelu največje jasnosti – torej med njimi ni prekrivanja ali pa so prikazane z različnih pogledov. V teh risbah je jasno prepoznavna pasovno vezana kompozicija, z zaprtostjo formata navzgor in navzdol ter z odprtostjo v levo in desno, ta način artikulacije likovnega prostora in kompozicije pa je značilen za faze likovnega razvoja, ki bi jih moral učenec osmega razreda osnovne šole že zdavnaj nadgraditi.



Slika 9



Slika 10

Ali tako likovno razvojno razliko med učencema pri isti starosti res lahko pripišemo zgolj prirojeni likovni sposobnosti? Če razumemo likovno izražanje kot jezikovni pojav, se kot problem razkrije naslednje. Učenec, ki je naredil sliko 10, verjetno ni imel dovolj priložnosti, da bi svojo likovno jezikovno sposobnost ustrezno razvil. Jezikovna sposobnost se mora namreč sprožiti v jezikovnem okolju in z jezikovno aktivnostjo v tem okolju (kot kažejo primeri volčjih otrok). Če se to ne zgodi dovolj zgodaj in dovolj pogosto, potem se jezik pomanjkljivo razvija. Učitelj lahko v tem

procesu zgolj pomaga in usmerja, ne more pa seveda v nekaj učnih urah nadomestiti pomanjkanja na ravni temeljne jezikovne izkušnje. Matthews (1999) ugotavlja, da otrok z eksperimentiranjem doseže spretnost v prostorski prezentaciji v daljšem obdobju, ki traja vse od zgodnjega otroštva. Otrok pri uvajanju globinskih odnosov v risbo uporablja različne prostorske ključne, kot npr. prekrivanje, stopnjevanje velikosti in kasneje konvergenco, ki jih raziskuje ločeno, pozneje pa jih začne svobodno uporabljati in združevati, vendar pa na določeni stopnji potrebuje usmeritev in pomoč učitelja ali mentorja (prav tam). Da je doseganje ciljev pri likovni vzgoji dolgotrajen proces, trdita tudi Duh in Vrlič (2003). Otrok, ki je z veseljem in zavzetostjo risal vse predšolsko obdobje in tudi med šolanjem, je pri reprezentaciji prostora precej suveren, čeprav, kot pravi Matthews (1999), najstnik tridimenzionalnosti predmetov in prostora še ne prikaže v pravi perspektivi, pa ploskve sestavlja tako, da doseže dovolj prepričljivo predmetnost. Iz tega sledi, da pomeni obravnavana vsebina za tega učenca koristno informacijo o poimenovanju in tehnični izvedbi posameznega prostorskega ključa kot tudi temelj za napredek in nadaljnji likovni razvoj, ni pa ključnega pomena za učinkovit prikaz iluzije prostora. Nasprotno pa za učenca, ki občutka za oblikovanje prostora ni razvijal že od zgodnjega otroštva, ki ni imel veselja ali želje po tovrstnem ustvarjanju, morda pa tudi ne spodbude, ta vsebina pomeni le faktografsko znanje, ki gre prav hitro v pozabo. To, da je bila v artikulaciji prostora uspešna le polovica vzorca v prvi risbi in še manj v drugi, je torej zaskrbljujoče. Nekaj podobnega bi bilo, če bi na ravni znanja besednega jezika sintakso znala uporabljati le polovica učencev osmega razreda osnovne šole. O primerjavi in odnosu med učenjem besednega in likovnega jezika govori tudi Matthews (2003), ki pravi, da otroci oblikujejo vizualni jezik, še preden dobro spregovorijo. Ko se otrok uči govoriti, znova in znova vadi glasove sam zase, saj se mu zdijo glasovne aktivnosti zanimive. Zanima ga, kako se glasovi sestavljajo, da dobijo določen pomen. Pri risanju je situacija popolnoma enaka. Otroci raziskujejo, ponavljajo, kombinirajo, se igrajo z oblikami, vzorci, barvami, črtami in gibi. K temu početju pa pogosto dodajo še glasove, ki so usklajeni z ritmom risanja – kot da bi si risbo »narekovali« (Matthews, 1999). Risanje je kompleksna dejavnost, ki vključuje otrokovo zaznavanje, gibanje in mišljenje (Trawick-Smith, 1997). Še en dokaz o prepletanju in povezanosti verbalnega in likovnega izražanja je po mnenju Matthews (1999) dejstvo, da otrok v začetku ne razlikuje med besedo in sliko/risbo in ju zato pogosto med seboj kombinira, meša. Na ta način poskuša na risalni površini ugotoviti razlike in podobnosti med figurativnimi podobami in dogovorjenimi pisnimi znaki. Otrok v svojem raziskovanju dveh semiotičnih sistemov njune meje namenoma razširi in ju med seboj prepleta, saj imata oba načina zanj enako pomemben status (prav tam).

Zaključek

Otrok spoznava svet in se pripravlja za vstop v odraslost tudi preko likovnega jezika, v katerem se od ranega otroštva likovno izraža in ki ga korak za korakom osvaja v razvojno pogojenem zaporedju. Ob tem se postavlja vprašanje, kaj se je na likovni razvojni poti zgodilo s tistimi učenci v raziskavi, ki so v risbi izkazali podpovprečne rezultate pri artikulaciji prostora na ploskvi. Možnih razlogov je precej, npr. odsotnost ustrezne spodbude za likovno izražanje v otroštvu, nerazumevanje otroškega likovnega izraza otroku najbližjih oseb, napačno pedagoško usmerjanje otrokovega likovnega delovanja, ukvarjanje z drugimi prostočasnimi dejavnostmi, ki jih npr. ponujajo nove tehnologije, vključenost otroka v številne zunajšolske dejavnosti ipd. Kateri razlog ali razlogi v posameznem primeru prevladajo, je nemogoče ali zelo težko opredeliti. Z gotovostjo pa lahko trdimo, da se bo posameznik, ki likovnega jezika ni spontano ponotranjil v kontinuiranem likovnostvarjalnem procesu v predšolskem in zgodnjem osnovnošolskem obdobju, tega naučil s precej več napora in namenskega učenja (Selan, 2014). Posebej je treba izpostaviti tudi dejstvo, da so učenci od šestega do devetega razreda deležni ene same ure likovnega pouka na teden. To pa je verjetno tudi srž marsikaterega problema, s katerim se soočamo pri likovnem pouku, saj ena ura likovne umetnosti na teden gotovo ni voda na mlin kontinuirane likovne aktivnosti učencev, poglobljene obravnave in utrjevanja likovnih pojmov, ustvarjalnih izvirnih idej in sproščene ustvarjalnega vzdušja, pa tudi ne dobre, natančne izvedbe likovnih izdelkov učencev. Pri takšni raznolikosti učencev, s kakršno se srečujemo učitelji, sta še posebej pomembni kompetenca in zaveza vsakega izmed nas, da pri svojem delu upošteva in spoštuje enkratnost posameznika. Ključnega pomena je individualna obravnava vsakega učenca in spremljanje njegovega napredka glede na njegovo izhodiščno stanje, ki je pri vsakem učencu drugačno, saj je odvisno od učenčevega predznanja, zainteresiranosti za delo, sposobnosti, natančnosti, ustvarjalnosti, vedoželjnosti, odzivnosti itd. Vsak učitelj bi moral znotraj vsakega izobraževalnega sistema ne glede na podajano vsebino, področje poučevanja ali starost učencev stremeti k vzgajanju odgovornih, uravnovešenih, samozavestnih, kreativnih mladih ljudi (Ingalls Vanada, 2016). Likovno izobraževanje ima v tem smislu prav posebno mesto, saj je njegova naloga učenje likovnega jezika, cilj pa spoznavno-poetična uporaba tega jezika, ki mu z vso pravico pripada naziv univerzalni jezik (Selan, 2014). Čeprav se je raziskava osredotočala predvsem na eno raven likovnega jezika, to je na obravnavo prostorskih ključev, so rezultati raziskave razkrili širši problem likovnega izobraževanja. Pokazali so namreč, da bistva usvajanja prostorskih ključev (in s tem tudi drugih načel likovnega jezika) ni mogoče zajeti v nekajurno učenje posameznih prostorskih ključev, pač je treba zagotoviti kontinuirano razvijanje sposobnosti artikulacije likovnega prostora (oz. vseh ravni likovnega jezika). Raziskavo bi bilo

zato v nadaljevanju smiselno razširiti tako, da bi se pomembnost kontinuiranega razvoja likovnega jezika še bolj razkrila. Torej bi jo bilo smiselno razširiti tudi na druga načela likovnega jezika, jo izvesti na bolj reprezentativnem vzorcu ter izvesti ocenjevanje nastalih likovnih del s široko skupino strokovnjakov.

Summary

In the article, we address an issue that can be observed in art lessons in the eighth and ninth grades of primary school in Slovenia. This issue concerns the ability to articulate the illusion of space in drawing by the use of visual gradients (e. g. perspective, light and dark modulation, size gradation etc.). Real space is a three-dimensional space in which we move and orient ourselves according to body planes defined by the structure of the human body. Real space can be represented in two-dimensional visual art space only by creating the illusion of a third dimension. Artists tried to solve the problem of creating the illusion of real space throughout the history of fine arts, especially in the Renaissance. The representation of the third dimension on a flat plane can only be achieved by the use of visual gradients. Therefore, the concept of visual gradients is an important part of the visual arts curriculum for eighth-grade classes in Slovenian primary school. At the age of fourteen, pupils can develop an awareness of perceptual constants that will enable them to properly understand visual gradients. However, once the pupils have acquired the knowledge of visual gradients, teachers often observe that pupils then fail to apply this knowledge in similar drawing tasks at a later time. In this study, we sought to define how eighth-graders, once having grasped the knowledge of visual gradients, use this knowledge in subsequent drawing assignments when there is no explicit demand for the use of visual gradients. During art lessons, we carried out qualitative research that consisted of two parts. The sample comprised 28 pupils in two eighth-grade groups. In the first part of the study, we informed and instructed the pupils on the visual gradients that they had to use in their drawings. In the second part, after three months, the same pupils performed another drawing task, this time without the instruction to use visual gradients. The drawings were then compared and analysed. By comparing two drawings from each pupil, we established the knowledge level of visual gradients and also how pupils applied this knowledge in the second drawing after three months. One of the key findings based on the results is that two-thirds of these pupils failed to extend their knowledge of visual gradients to the second drawing (despite having applied it in making the first drawing). This reveals to us that a single exposure to visual gradients does not lead a pupil to internalise knowledge of visual gradients or to use it spontaneously. To

be able to spontaneously master the nature of visual art space, a pupil must undergo a longterm artistic experience with visual art space.

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THE RELATION BETWEEN PEDAGOGICAL APPROACHES IN MUSIC EDUCATION AND STUDENTS' PERFORMANCE ANXIETY

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Abstract/Povzetek Performance anxiety is a significant problem in general education, as well as in music education. Therefore, the purpose of this study is to determine whether the Functional Music Pedagogy (FMP) approach has a significant effect on music performance anxiety in children. The neglect of improvisation as a basic methodological tool in FMP instrumental practice could explain why the main effect of school type was not significant in this sample. The lack of Music Performance Anxiety differences between students who have learned music through distinct pedagogical approaches can be interpreted as a result of the physiological and psychological developmental changes that arise on entering puberty as a consequence of hormonal changes and increased emotions during early adolescence

Keywords:
Elly Bašić;
functional music
pedagogy;
music education;
music school with
standard program;
music performance
anxiety

Ključne besede:
Elly Bašić;
funkcionalna
glasbena pedagogika;
glasbena vzgoja;
glasbena šola s
standardnim
programom;
trema pri izvajanju
glasbe

Razmerje med pedagoškimi pristopi v glasbeni vzgoji in učenčevu tremo pri nastopanju

Trema pri nastopanju je pomemben problem tako v splošnem izobraževanju kot v glasbeni vzgoji. Namen te študije je ugotoviti, ali pristop funkcionalna glasbena pedagogika (FMP, angl. Functional Music Pedagogy) pomembno vpliva na tremo otrok pri izvajanju glasbe. Zanemarjanje improvizacije kot temeljnega metodičnega orodja v vadbi instrumentalne glasbe bi lahko pojasnilo, zakaj glavni učinek tipa šole v tem vzorcu ni bil pomemben. Pomanjkanje razlik v glasbeni tremi med učenci, ki so se glasbe učili po različnih glasbenopedagoških pristopih, je mogoče interpretirati kot rezultat sprememb njihovega fizičnega in psihičnega razvoja, ki nastanejo ob vstopu v puberteto kot posledica hormonskih sprememb in povečanih čustev v zgodnji adolescenci.

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Introduction

The contemporary lifestyle and advances in technology have contributed to the growth of uncertainty, tension and fear. According to Jeffers (2014), fear is an epidemic in modern society because people today have numerous fears, such as the fear of change, living and death. Competition and ranking are now present in every discipline, and these contribute to the development of several fears, such as the fear of criticism, of making mistake and of failure. Therefore, even thinking about public performance for most people, regardless of their sex, education, age or experience, from all disciplines and professions (musicians, actors, teachers, speakers, priests, etc.) induce a feeling of fear. Most of them would rather come down with the 'flu than perform in front of an audience, which is reasonable according to studies that associate performance anxiety with an increased possibility of "significant physical and mental health deterioration, as well as a lower possibility of success" (Rost & Schermer, 1986, p. 127).

Even though most musicians choose their vocation because of their love for music and the desire to share it with others, they tend to experience fear and agitation on stage rather than excitement (Lehmann et al., 2007). That state of mind elevates stress, tension, fear of mistakes, and fear of failure during rehearsals and at the actual performance, all of which further perpetuates a high level of anxiety among professional musicians and students. A successful musician should, in addition to excellent technical skills and musicality, also possess the stamina to endure the psychological and physical demands associated with performing in front of an audience.

An encouraging fact is that, according to Jeffers (2014), fear is first and foremost an educational problem, not a psychological one. Therefore, education in general and music education need to align their programs with the current demands of the education system in order to encourage divergent opinions, freedom of expression, and creativity, while encouraging students to develop creative and independent problem-solving skills. Considering the numerous benefits of music for human development, music education should be available to every child, with the aim of promoting children's holistic development. In addition to sensibility, creativity, and similar abilities associated with the arts, music education should represent a method of cognition, experience, communication and freedom of expression, without feelings of fear and anxiety during music performance. Every music instructor and parent should have that goal in mind.

Several causes of public performance anxiety have been identified. The fight-or-flight response was first described by Walter Cannon in 1932, and it is considered to be a primal response to stress as an important survival mechanism. Just like animals, humans respond to acute stress by fighting a certain threat or fleeing from

it. That is an automatic and natural reaction of the human body to stressful and potentially dangerous situations. The body as an organism attempts to find a solution, so several physiological and biochemical processes allow the brain to react in a stressful situation in order to protect us from potential dangers. In order to activate that defensive mechanism for emergency situations, the brain activates the sympathetic nervous system. Hormones affect organs throughout the body in that state, so people experience several sensations: fluttering in the chest, excessive sweating, shortage of breath, dry mouth, anxiety lumps in the throat, butterflies in the stomach, blurred vision, difficulty focusing, tension, trembling, etc. (Lehmann et al., 2007). The situation itself is not stressful, but our perception makes it stressful and produces those symptoms.

Given that we are exposed to the judgment of others during a public performance, we are afraid of being ridiculed, exposed as imposters or rejected by the audience. Fear of public performance is also called *stage fright*, and it is considered to be one of the most common social fears (Williams, 2012). Social anxiety is associated with feelings of fear, self-consciousness, and emotional imbalance in a controlled social situation. That type of anxiety arises when people want to leave a good impression but doubt their ability to succeed (Schlenker & Leary, 1982). Focus turns to catastrophic cognitive states that have an adverse effect on a person's concentration and performance. This is a shared trait between social anxiety and public performance anxiety, which causes a state similar to social phobia at its peak (Kenny & Osborne, 2006).

The American Psychological Association (2000) considers performance anxiety, nervousness and shyness as normal experiences in social situations that involve strangers, so these should not be diagnosed as disorders if they do not significantly affect a person's ability to function. Children are usually exposed to social anxiety when communicating with adults. Anxiety can be triggered by a conscious, rational concern or by unconscious processes associated with previous experiences and sensory perceptions. For example, unpleasant experiences with public performance can contribute to the development of negative cognition regarding future performances (Barlow, 2002; Beck, 1995; Beck, Emery, & Greenberg, 1985). When a person begins the performance, they start their self-assessment, which focuses mainly on their inability to face the threat.

Salmon (1990) defines Music Performance Anxiety (MPA) as an experience of consistent perception of incompetence or an actual reduction of skills in a public context to an extent that cannot be justified given the performer's existing talent and hours of practice. MPA is one of the psychological variables that most affect the quality of musical performances in front of an audience (Papageorgi, Creech and Welch, 2011) and can eventually lead to a series of cognitive, physiological and

motor difficulties (Studer, Danusera, Hildebrandt, Arial, & Gomez, 2011; Wilson, 2002).

Wilson (2002) identified three sources of anxiety during music performances: the person, the situation and the performance task. The musician can have a certain predisposition towards anxiety and unrealistic attitudes about performing. Situational stress can also arise given the characteristics and circumstances related to a specific performance, and it is important that the task does not exceed the performer's skills because a sense of control over the composition is important in order to perform it with confidence (Lehmann et al., 2007).

In order to explain performance anxiety, Barlow (2000) recommends an integrated triple vulnerability model that can explain why generalized anxiety or mood disorders arise. These vulnerabilities include general biological vulnerability, general psychological vulnerability, and disorder-specific psychological vulnerability. General vulnerabilities alone, such as genetic predispositions and early environmental influences, can trigger the onset of generalized anxiety disorder, but only disorder-specific vulnerabilities can cause specific anxiety disorders, such as panic disorder or phobias. Barlow defines anxiety as "a state in which a person has no control ... a state of helplessness ... because they cannot achieve the desired results and outcomes ..." That definition is similar to the definition of perfectionism suggested by Frost, Marten, Lahart, and Rosenblate (1990, p. 449). For example, "excessive concern about possible mistakes, high personal standards, high expectations from parents, the perception of criticism from parents, having second thoughts about the quality of other people's activities, and a penchant for order and organization" (Barlow, 2000, p. 1249).

Anxiety or fear of performing in public can have an early onset among musicians. According to Kenny and Osborne (2006), young children do not experience the same type of anxiety as adults because they enjoy performing and are blissfully unaware of any flaws in their performance. However, Williams (2012) notes that children can also experience fear of public performances. Children in a choir can be used as an example because they tend to perform well during rehearsals, but can become paralyzed by fear during a performance in front of an audience. Students in school also tend to display similar reactions when they need to carry out a presentation or answer a question in front of the class.

Kenny and Osborne (2006) argue that children grow out of the phase, "Mommy, look at me, aren't I smart?" and transition to a different way of thinking: "Please, don't make me perform; I know I'll make a mistake and embarrass myself" (p. 103). That transition is associated with various factors, such as innate temperament, anxiety traits, cognitive capacity growth, self-preservation, the ability to change perspectives in late childhood and adolescence, parenting, interpersonal

experiences, perception and the interpretation of the world, technical skills, dexterity, and performance-specific experiences associated with negative or positive outcomes. Lehmann et al. (2007) also argue that children enrolled in music school often experience (MPA) because their parents pressure them into achieving results. Pruett (2003) believes that an elevated state of anxiety among musicians, combined with high expectations from parents, a low level of social support, and a high frequency of testing their abilities in a competitive environment can trigger psychological, behavioral and cognitive responses that resemble anxiety during public performances.

Music Performance Anxiety in Children

Anxiety during music performance was first discovered by accident when Simon and Martens (1979) investigated anxiety in sport by comparing anxiety associated with athletic performance to anxiety associated with test-taking and musical performances. A total of 749 boys participated in that study, and it was found that boys between the ages of 9 and 14 experience the highest level of anxiety during solo musical performances. Public performances in a band were associated with the highest level of anxiety compared to other group activities, including team sports. This study was replicated by Ryan (1998, 2004, 2005) and showed that music students experienced anxiety regarding public performance in a manner similar to the anxiety experienced by a sportsman or sportswoman before a match.

About 90% of adult musicians begin their musical training before 12 years of age and 46% of these before the age of 7 (Nagel, 1993). Lehmann and Kristensen (2014) found that the relation between the age of onset and musical achievement is that the acquisition of certain technically demanding skills requires early initiation into music. Since a music career today begins much earlier, it is important to explore the expression of MPA in younger students. Some research suggests that MPA is present very early in children and that it can occur at the early stages of musical training, even at the age of 3 (Boucher and Ryan, 2011). Zarza-Alzugaray et al. (2018) confirmed the notion that the age when pupils start learning to play music leads to significantly different levels of MPA later on. Some authors noted that understanding MPA would be beneficial, both to those who go on to work in a highly competitive industry, and also for those performing at an amateur or semi-professional level (Thomas and Nettelbeck, 2014).

Ryan (2003) researched anxiety symptoms during music performance on a sample of 173 children between 3rd and 7th grade. It was found that most children present psychological symptoms similar to those of adult musicians and that their performance anxiety is negatively correlated with self-esteem and quality of performance. In addition, the author concluded that, regardless of their sex,

education, age or experience, MPA increases with a larger audience and greater significance of the performance (Ryan, 2005). According to their symptoms, the children demonstrated a significantly higher state of anxiety on days when they performed in school concerts (Ryan, 1998, 2004). That study proves the existence of music performance anxiety in children and shows the characteristics it shares with performance anxiety in adults (Kenny and Osborne, 2006). Furthermore, Osborne and Kenny (2008) found that teenagers between the ages of eleven and eighteen also experience some level of performance anxiety. Based on an analysis of 16 studies, Brugués (2011) concluded a review of the literature by stating that adolescents between the ages of fourteen and nineteen have high MPA scores and show symptoms similar to those of adults. She thus concluded that children rarely experience MPA, but that it appears during the transition to adolescence.

Research examining the implications for music educators of creating effective learning environments and safe spaces for music learning reveals that 23% of children and 34% of adolescents suffer from clinically relevant levels of music performance anxiety. These percentages may vary in different contexts according to differences in teacher approaches, community values, family support, and the student's state of mental wellbeing (Hendricks, Smith and Stanuch, 2014).

Results of a study measuring performance anxiety levels of 74 teenagers attending a German special music school demonstrated that high school students do experience significant levels of performance anxiety. A third of teenagers felt that their performance was negatively affected, and a tenth felt that their career would be negatively impacted by anxiety. It is particularly important to point out that most students wished they had more help in managing their anxiety (Fehm and Schmidt, 2006).

Habe and Kržič (2017) explored MPA in music school students in early adolescence. The results reveal that there are no differences in MPA between younger (aged 10-12) and older (aged 13-15) music students in early adolescence, while MPA is more prevalent in girls than in boys. Furthermore, they concluded that students who started performing early in childhood, those who enjoyed being on stage and had positive first performance experiences, experienced less MPA.

Dempsey (2015) concluded that there are differences in the intensity of the experience of MPA between children and adolescents, while adolescents reported having intense performance anxiety symptoms as children.

Osborn and Kenny (2008) conducted research involving 298 students aged 11 to 19, who described their worst musical performance in writing. The authors assessed the student's descriptions in six areas: situational and behavioral factors, emotional, cognitive and somatic symptoms of anxiety and performance. The results showed that girls experienced an imbalance with exercise anxiety more intensely than boys,

and that as much as 78% of pupils had a negative initial experience with performance. The study highlighted the importance of using cognitive presentations in the identification of exercise anxiety and cognitive-behavioral therapy in the management of exercise anxiety.

Pedagogical Approaches in Music Education

The traditional approach to teaching music focuses on reproducing the knowledge and education of professional musicians, but several pedagogical approaches use music to facilitate the holistic development of children, regardless of which future professions they choose. This humanistic approach to music was introduced by several authors at the end of the 19th and beginning of the 20th century, including Orff, Dalcroz, Kodály, Willems, Suzuki, and the Croatian music teacher Elly Bašić. Their primary goals were to teach art, teach music through play and spontaneity, and support freedom of expression and creativity, while avoiding perfectionism, competitiveness and fear of making mistakes. Whereas the traditional approach in music education follows a rigid plan, the approaches proposed by these authors are student-centered, and thus focus on their needs, abilities and interests (Renzulli & Reis, 1997; Renzulli, 1999; Sternberg, 2003).

The aforementioned goals were integrated into Functional Music Pedagogy (FMP) by Elly Bašić, and the fundamental concepts of that approach are best described by the following postulates: *all children have a right to music education; all children have a good ear for music; all children have a sense of rhythm; having a good ear for music is not the same as being musical; all children have a creative imagination* (Perak Lovričević, 2005). In accordance with these postulates, the FMP approach does not evaluate a student's creative work. In order to protect students from the fear of making mistakes and failing, Elly Bašić decided to remove grading, so that children did not become motivated to learn only for the sake of getting good grades. That is why music schools that implement the FMP approach do not use standard grading methods. Furthermore, the approach is based on methods and didactic principles aimed at reducing the environmental pressure that causes children to feel afraid and stressed. Nor do music schools that use the FMP approach conduct entrance exams to select students because that practice promotes individualism and is associated with a specific formal structure and workflow organization. In standard programs used by music schools, grades are the primary method for motivating students, but FMP uses grades as just one way to track the students' progress in music over time. FMP schools do not share grades with children, nor do they send grade reports to their parents, except at the end of the final year. Elly Bašić emphasized belief in children and their dispositions, as well as emotional support and nurture, as the basis for their growth without developing a fear of failure.

Improvisation is also emphasized as the fundamental and most important method that children use to create music, as well as one of the most natural and creative methods that can be used in music education. Spontaneous improvisation is specifically valued because children can become active participants in the creative process through active discovery and learning. Children then have the opportunity to express themselves in an area that makes them feel safe (visual, literary and kinetic) and thus to combine multiple art forms.

According to the teaching plans and programs designed for FMP music schools (2006), besides children's natural predisposition for music, teachers should also encourage the development of their imagination and creativity and help them develop a holistic, well-rounded personality. Standard teaching plans and programs for music and dance schools (2006) also mention the education of professional musicians with different profiles and occupations as one of their goals. Given that goal, music schools that have adopted the standard program have a selection process during enrollment that chooses students based on their predispositions, and they use grading as the primary evaluation method for assessing students' knowledge and skills.

Methods

Research problems and hypotheses

The research problem on which this study focuses concerns the differences in somatic and cognitive features, performance contexts and performance evaluations between students enrolled at the Elly Bašić Music School, which implements the Functional Music Pedagogy (FMP) approach, and those enrolled at another music school in Zagreb using the standard music teaching program. In accordance with the research problem, the following three hypotheses were developed:

H1: The type of school and grade will have a significant effect on how students assess their somatic and cognitive features before and after a public performance.

H2: The type of school and grade will have a significant effect on how students assess their performance context during an exam or a public performance.

H3: The type of school and grade will have a significant effect on how students assess their performance evaluation during an exam or a public performance.

Participants

The sample was drawn from two music schools located in Zagreb, Croatia and consisted of 232 4th-, 5th-, and 6th-grade students, most of whom were female, $n=141$. The distribution of students by grade and type of school is shown in Table 1.

Table 1. *The Distribution of Students by Grade and Type of School*

Grade	Type of School		Total
	FMP	SP	
4th	36 (33.34%)	38 (30.65%)	74 (31.90%)
5th	31 (28.70%)	47 (37.90%)	78 (33.62%)
6th	41 (37.96%)	39 (31.45%)	80 (34.48%)
Total	108 (100.00%)	124 (100.00%)	232 (100.00%)

Notes. FMP – Functional Music Pedagogy; SP – standard program

Instrument

The *Music Performance Anxiety Inventory for Adolescents* (MPAI-A; Osborne & Kenny, 2005) was administered to the students at the end of the school year. The scale consists of 15 items divided into three subscales: *Somatic and Cognitive Features*, *Performance Context*, and *Performance Evaluation*. *Somatic and Cognitive Features* refers to the psychological manifestations of performance anxiety before and during the performance, as well as the fear of making mistakes during the performance. The *Performance Context* subscale lists the advantages performers associate with performances in single or group contexts and the nature of the audience. The third subscale, *Performance Evaluation*, contains items associated with the performer's or audience's evaluation of the performance, the consequences of those evaluations (usually when a mistake occurs) and difficulty concentrating on the performance in front of an audience. The Cronbach's alpha of 0.88 suggests that the scale has good internal consistency. Approval was obtained from the authors to translate the questionnaire from English to Croatian and use it in this study.

Results

The two-way ANOVA results are shown in Table 2. The main effects of grade and school, as well as their interaction effect, on *Somatic and Cognitive Features* and *Performance Context* were not statistically significant. Therefore, the first and third research hypotheses were rejected. The main effect of grade on *Performance Evaluation* was statistically significant, but the main effect of school and the interaction effect were not. Based on these results, the second hypothesis was partially confirmed because differences between the *Performance Evaluation* scores of students from different grades were statistically significant.

Table 2. *Two-way ANOVA Main and Interaction Effects by Subscale*

Subscale	Effect	<i>f</i>	<i>p</i>
Somatic and Cognitive Features	School	0.06	0.81
	Grade	2.49	0.08
	School * Grade	2.37	0.10
Performance Evaluation	School	0.02	0.90
	Grade	3.70	0.03
	School * Grade	0.06	0.94
Performance Context	School	0.25	0.62
	Grade	0.73	0.49
	School * Grade	0.47	0.63

Differences in Performance Evaluation scores between groups by grade were analyzed using the Bonferroni method. The average Performance Evaluation score was significantly higher for 5th-grade students compared to 4th-grade students, 3.39 ± 1.27 vs. 2.88 ± 1.05 , $t = 1.94$, $p = 0.027$. The average Performance Evaluation score for 6th-grade students, 3.00 ± 1.07 was lower than it was for 5th-grade students, but the difference between the two groups was not statistically significant, $t = -1.25$, $p = 0.11$. Average scores on individual items constituting the Performance Evaluation subscale by grade are shown in Table 3. It was found that 5th-grade students were significantly more likely to panic after making mistakes compared to 4th-grade students, $t = 2.87$, $p = 0.002$. The comparisons between groups on other items found no statistically significant differences, but the scores in Table 3 show that 5th-grade students in this sample have the highest levels of performance anxiety compared to students from other grades.

Table 3. *Mean Scores for Each Item on the Performance Evaluation Subscale by Grade*

Item	Grade		
	4th	5th	6th
7. When I perform in front of an audience, I find it hard to	2.09	2.57	2.32
8. If I make a mistake during a performance, I usually panic.	2.61	3.72	3.14
10. When I finish performing, I usually feel happy with my	4.03	3.97	3.80
13. I worry that my parents or teacher might not like my	2.78	3.30	2.74

Discussion

The main effect of school type, which refers to the schools' distinct methodological approaches to teaching music, was not statistically significant. As some research has revealed, levels of MPA can vary in different contexts, depending on differences in teacher approaches, community values, family support and the student's state of mental wellbeing (Hendricks, Smith and Stanuch, 2014), as well as the transition from childhood to adolescence when children have a more pronounced experience of MPA (Brugues, 2011; Dempsey, 2015). The farther along children are in the stage of puberty, the more vulnerable they are to experiencing and coping with MPA (Habe and Kržič, 2017).

The music school that adopted the FMP approach uses spontaneous improvisation only during the first stage of music education (i.e., 1st and 2nd grade), which could explain why the main effect of school type was not significant in this sample.

Given the specifics of the FMP approach, including the use of alternative evaluation methods instead of grading, the application of spontaneity and improvisation to develop students' freedom of expression, and the specific A/B program introduced in the third stage of music education (5th and 6th grades) to adapt instruction to the students' abilities and interests, it was expected that students enrolled at the Elly Bašić Music School would report a lower level of performance anxiety compared to the students from the other school. In accordance with the assumption that children's creative work should not be evaluated, schools that implement the FMP approach do not grade their students in class, and so a lower performance anxiety score during solfeggio lessons in front of other students and teachers was expected from students enrolled in those schools. Methodological games are used to revise the content of solfeggio lessons, so that approach should reduce children's performance anxiety even further.

On the other hand, the actual implementation of improvisation to encourage spontaneity and develop freedom from fear of making mistakes and a sense of self-confidence can be reflected in a person's performance. A survey of piano teachers found that most of them (71%) use improvisation only during the first stage (i.e., 1st and 2nd grades) of their students' music education. According to the participants, improvisation is rarely used because the short duration of music classes does not allow them to implement that method effectively. Therefore, assuming that those findings can be generalized to music teachers who teach other instruments, students experience improvisation only early in their music education. Using improvisation in the classroom liberates the students in a sense, since it helps them develop a sense of self-worth and self-confidence (Bačlija Susić, 2012); it is thus possible that no significant differences between the groups from different

schools were found because the students in this sample had not been practicing improvisation recently.

Significant differences were observed between groups in different grades on the *Performance Evaluation* subscale, which collects data on concentration during public performances, controlling the situation after making mistakes, and concerns regarding the opinions of parents and teachers. It was found that 5th-grade students experienced higher performance anxiety compared to 4th-grade students, possibly because of the difference in age and experience.

Furthermore, students tend to determine their interest in music in the 5th-grade and decide whether they will continue their music education, so it is possible that those students who continue their music education in the 6th grade are less concerned about public performance.

Some specific characteristics of the FMP approach, such as the A and B program in the third phase of music education (5th and 6th grades), could also explain the increase in performance anxiety observed between the 4th and 5th grades. According to Wilson (2002), those performance tasks that do not exceed the performers' skills can reduce the severity of performance anxiety. If musicians have a sense of control over the composition they are performing, they will remain confident. As long as students choose a program that is consistent with their skills and interests, they will also be more likely to avoid public performance anxiety if they perform with interest, dedication and love.

Conclusion

The results of this study indicate that there are no significant differences between subjects from different schools in the self-assessments of their Somatic and Cognitive Features, Performance Context and Performance Evaluation scores.

Experiencing MPA can be attributed to the transition from childhood to adolescence and the physiological and psychological developmental changes that arise when children enter puberty (Brugues Ortiz, 2011; Dempsey, 2015; Habe and Kržič, 2017) as a consequence of hormonal changes and increased emotions during early adolescence (Buchanan et al. 1992 in Papalia, Olds and Feldman, 2003). It can vary in different contexts according to differences in teacher approaches, community values, family support, and the student's state of mental wellbeing (Hendricks, Smith and Stanuch, 2014).

Neglecting improvisation in FMP instrumental practice (Bačlija Sušić, 2012), along with the other factors mentioned could be among the reasons for the lack of differences between the two pedagogical approaches with regard to MPA.

Nevertheless, it is important to aim for a humanistic approach to music education in order to emphasize the development of the students' personalities rather than the evaluation of their knowledge and ability. Emphasizing spontaneity and improvisation at all stages of music education instead of evaluation and grading is recommended to reduce performance anxiety in students.

The age of puberty is a period of searching for one's identity, a time when a teenager tries to invent his own self (Erikson, 1968 in Papalia, Olds and Feldman, 2003). Therefore, to increase the students' sense of confidence, personal freedom and control over life choices, it is important to stimulate the development of their internal locus of control rather than the external locus of control, which stimulates students to find motivation from external sources, such as grades, competition results, etc. Because MPA is expressed in early childhood, primary prevention should probably begin much earlier.

A significant factor that can reduce the fear of public performance is the teachers' personality and performance in class, which has to be student-centered and focused on helping them develop a love for music. The experience of peace and love is, according to Jampolsky (2010), the best way to liberate a person from fear. Only that approach in music education can contribute to the development of free and creative individuals, without fear of public performance, who will be able to use all of their vital energies to create and control their own lives.

MPA among children and adolescents in music is not well understood and requires further research, especially since music careers today start much earlier than before. Therefore, it is important to examine the various strategies for controlling MPA in children and adolescents because research on performance anxiety in children and adolescents is still incomplete when compared to the literature on adult MPA.

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RESEARCH PROBE “MY HOME”, ARTIST-BASED RESEARCH / IN SEARCH OF LANGUAGE TO INTERPRET PERCEIVED AND EXPERIENCED SPACE

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Abstract/Povzetek In the research probe “My Home,” we investigated students’ statements about and how they experience their relationship to a particular place: home. The subject of this exploration is the mutual overlap among architecture, works of art and art education, and their common language across these fields.

The character of our research was inspired by phenomenological approaches. We chose methodologies related to art and design creation. We arrived at the conclusion that the phenomenology of architecture investigated in connection with the semiotic concept of art education can yield much inspiration and is a topic relevant to both the teaching artist and students.

Keywords:
architecture;
creative reflection;
experience
interpretation;
methods in pedagogy;
spatial forms

Raziskovalna sonda “Moj dom”, Na umetniku temelječa raziskava / *Iskanje jezika za interpretacijo zaznanega in doživetega prostora*

V raziskovalni sondi “Moj dom” smo raziskovali izjave študentov in kako doživljajo svoj odnos do določenega prostora – doma. Predmet tega proučevanja so vzajemna prekrivanja arhitekture, umetniških del in likovne vzgoje ter njim skupen jezik na teh področjih.

Značaj naše raziskave je bil navdahnjen s fenomenološkim pristopom. Izbirali smo metodologije povezane z likovnim in oblikovalskim ustvarjanjem. Prišli smo do sklepa, da fenomenologija arhitekture, ki jo proučujemo v povezavi s semiotičnim konceptom vzgoje in izobraževanja, daje mnogo inspiracije in je relevantna tema tako za umetnika, ki poučuje, kot za študente.

Ključne besede:
arhitektura;
ustvarjalna refleksija;
doživljajska
interpretacija;
metode v pedagogiki;
oblike prostora

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Introduction

The Research Project

Basic characteristics and project objectives

The Project “Phenomenon of Architecture and Its Pedagogical Implications” forms part of the ongoing outcomes of doctoral studies at the Department of Arts, Charles University, in Prague, Czech Republic. Its objective is to investigate this phenomenon through artistic creation mediated to students and to explore the potential for using findings about the creative processes in educational situations with university students. The Project is based on current public discussions about how architecture influences our apprehension of public space and the quality of life connected with it (Melková, 2013). The topic follows up on the artwork series of the researcher, called Subjective Urbanism.

The Project’s points of departure became part of a deeper investigation into how attitudes, values, opinions and their possible changes are structured. It took place at joint sessions of the teaching artist with the students over the topic of apprehending and experiencing architecture and space. The students were invited to participate in co-creation. The resulting documentation became part of a folder containing reflexive evaluation and artistic solution variants. Combinations of specific forms of qualitative and art-based research were exploited in the project (Fulková, 2008). The interpretation of research findings will hopefully become the basis for enhancing the quality of education in the “mediation of architecture” units as part of the art teacher training programs.

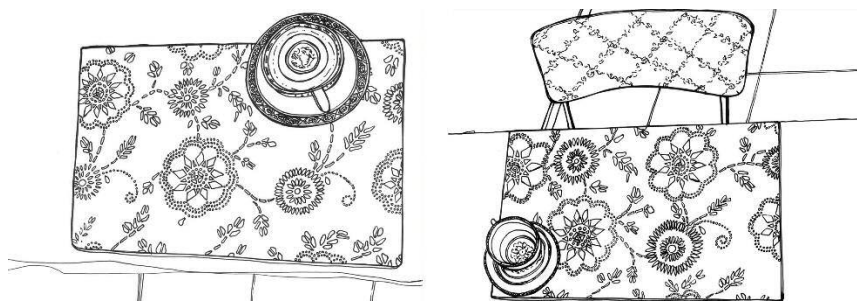


Figure 1: Pavla Gajdošíková, Staring at the Corner, drawings, 2005 – 2018

Project Rationale

Architecture is an inseparable part not only of our visual world but of human existence, as well. Its content extends to both its utilitarian and artistic functions; it is both *res publica* (a public affair) and *res politica* (a political affair). The topic of our relationship to architecture and the environment is currently very timely, yet it is

not being adequately treated on the society-wide strategic level. Since the 1990s, it has been possible to notice intense discussions in professional periodicals, at conferences and in public life. These discussions seem to suggest that the way of getting architectural concepts across to students should, in principle, involve teaching them how to handle space with competence, since space is in direct relationship to our experiencing the world and finding our identity within it (Kratochvíl, 2015).

A relation to space is essential for human beings, since we cognitively grasp the environment from birth, structuring interpersonal relationships according to basic concepts (Číhalová, 2008), even before learning how to speak or to handle other symbolic systems. People spend practically their whole lives in a 'built' environment, which is recognized and constructed vis á vis its opposite, i.e. the open landscape. Perceiving, experiencing and realizing space thus have always played an essential role, which has both subjective and social (cognitive and educational) connotations with economic consequences.

However, the topic of architecture is almost absent from schools and teacher training programs in the field of arts. In our experience, such discussions take place only rarely, not only in elementary and junior high schools, but unfortunately even in secondary schools, colleges and universities.

The necessity of change is called for by, for example, Elisabeth Gaus-Hegner, a German educationalist with long experience of teaching architecture to children, with a focus on art didactics and architecture education; she underpins the necessity of paying attention to this topic from early childhood. According to her findings, it is very important to mediate architecture to children; this means deliberately opening the way for them to experience and get acquainted with space (Gaus-Hegner, 2009).

Research Probe "My Home" – Implementation

The Research Probe "My Home" was implemented in October 2017 as a probe of the participatory type at the Faculty of Education, University of Maribor, Slovenia, in cooperation with Tomaž Zupančič, a Slovenian researcher and educator. The probe was part of a workshop called "My Home" (The Place Where I Live). A total of 180 minutes was devoted to it within the framework of art didactics teaching. The sample chosen for the research comprised 11 students, aged 20 to 24 years.

Research - Theoretical Postulates

In the theoretical postulates, we focus mainly on the semiotic concept of art education. In art education, semiotics is a powerful concept, which can be used to

revise traditional educational processes; it has a strong impact on the topic and focus of the study, and on the research method itself (Fulková, Tipton, 2008). In this case, the character of our research was inspired by phenomenological approaches, based on the assumption that a phenomenological subject is understood as a “speaking subject” (for instance, a human, a student or “me”). The forms of voices, i.e. their utterances, then exist in close relation with those subjects, who are by their very nature aware of what they say, while simultaneously inviting reflection (Kotzmannová, 2013; Fulková et al., 2013).

We are also interested in the poststructuralist tradition, in a manner similar to that used in the dissertation by Alena Kotzmannová: *The Phenomenon of the Sea, Photographs and Description of Sea in Selected Art Forms*, which became a starting point for our own research.

In our case, we applied a methodology related to research into artist and designer creation (art-led and practice-based research, or artography) (Irwin, 2004). Specifically, the reflective-practice concept of Donald A. Schön was used for our probe. This approach, which arose from Schön’s observations of students of architecture, is a reflection on learning as a tool for gaining knowledge everywhere, where the linear learning model fails and expert knowledge is torn from practice; he also vindicates the implicit, tacit knowledge of practitioners (Schön, 1983).

Research Problem – Research Questions

The research probe analysis took place in several steps and in the form of response to research questions, which were asked one by one over the course of the research.

1. What are the existing attitudes of both Czech and foreign undergraduate students to architecture and other forms of spatial art?
2. Can these attitudes be changed during joint meetings between the teaching artist and students over the phenomenon / topic of architecture?
3. What are the phenomena on which students focus when perceiving their inner and outer lived space? How do they speak about it, and in what terms? Which phenomena do they mention most frequently?

The topic assigned and workshop progress

The assigned topic “My Home” (The Place Where I Live) was oriented towards perceiving and realizing space and towards the ability to subsequently conceptualize an artistic solution. We tried to assist students in developing a new artistic sensibility and interdisciplinary creativity, which are often missing from their professional knowledge (Hazuková, 2010).

In the first part of the workshop, the students became acquainted with the creative portfolio of the artist researcher Pavla Gajdošíková, who tackles the topic of space and architecture in her artwork. After that, the students were invited to discuss and critically reflect upon the artist's work.

The participants were then asked to depict the space of their home, or the place where they lived at the moment, by means of a variety of techniques (drawing or painting). The assigned topic was focused on perceiving and realizing space, and the ability to consequently conceptualize an artistic solution.



Figure 2: Pavla Gajdošíková, Something Somewhere is Happening, Gallery Entrance, installation view, Prague, 2017

Method of processing the research findings

The research material that resulted from implementing this probe was subject to a three-step analysis, methodologically based on Schön's concept of reflective practice. Each step (level) of reflection obtained was subject first to open coding, and later to axial coding. Each coding process yielded a list of codes, based on which concept maps were outlined. These maps were further reflected upon and evaluated. All conceptualizations obtained during coding were triangulated (Fulková, 2008; Hendl, 2005).

III. Evaluating reflection on the content and progress of the workshop – research probes

Evaluating reflection from the student viewpoint

We chose both Czech and foreign students for our research probes, to take into account possible differences in apprehending architecture and space in different cultural environments.

In presenting the reflections offered by the students, we would like to call attention to the justification and confirmation of the importance of such research probes

being done in a chosen foreign environment: *"I am glad that the artist comes from another country. It is interesting to listen to people from other countries. The teacher described to us the situation in her environment and how people perceive art there. It was a very interesting lesson. I never thought about my home in such a context, it was difficult to describe my house to somebody else. I thought it would be easy because I know my house and everything is so intimate and familiar, but it turned out to be very hard after all."*



Figure No. 3: Students of the Faculty of Education, University of Maribor during the research probe

What emerges from the students' reflections in the probe is that the topic of architecture and the related topic of apprehending and experiencing space are absent from the local educational system. However, students demonstrated willingness or even eagerness to investigate and explore this topic further, including their interest in the conceptual approach that was employed in this case.

For instance, one of the student participants in the probe stated: *"It is a problem in our educational system. We should teach architecture, but unfortunately we do not even mention this topic in the course of our own studies. This topic was very interesting. I believe we should think about space more often, we sometimes don't even realize where we live. I think this topic is also suitable for children, this method of working in pairs. We worked from a simple sketch on to the final painting."*

Evaluating reflection from the viewpoint of art teachers

The authentic content of the students' reflections was confirmed by pedagogical remarks from Tomáš Zupančič, who attended the lessons and highlighted *"the students thinking like teachers"*.

"Students themselves underlined the need to study space and architecture in their portfolio and art teaching program. In the course of the workshop, the students appreciated the part when they worked in pairs and came up with the idea of utilizing this approach in their teaching practice."

We arrived at several findings based on the concept map, which we wish to illustrate by quotations from the author's pedagogical notebook:

"It was interesting for the students to go through the whole process, from chatter to discussion, from experiencing to creating. From conceptual pondering to artistic expression, in this case in the form of drawing and painting. The result was a color picture, which in fact evades direct description of space, but is its colorful representation. It was important for the students to go through the whole process of creation."

The importance of the whole process of the workshop is also expressed in statements by students who went through several stages of artistic perception and expression. *"No teacher showed us his or her work like this in the past, neither did they open up to us their way of perceiving and thinking, I very much appreciate that."*

"I didn't enjoy this topic much before, but after today's assignment I am starting to reconsider my previous slightly negative thinking about static architecture."



Figure No.4: Students of the Faculty of Education, University of Maribor during the research probe

Concept map analysis

In the concept maps, we analyzed different ways of teaching, forms of teacher-student cooperation and the potential for their mutual influence. What emerged as essential was the code of the *students' attitude to the topic*, influenced by the codes of *emotion* and *perception*, but also by the *theoretical and practical points of departure*, used by both students and teacher. Thus, the *pedagogical work* forms part of these starting points, but at the same time, of individual *self-reflection*; it is influenced by the *artistic and expressive medium*. *Conceptual thinking* is the result of inter-penetration between

these parts, and can lead to their *mutual inspiration*, which further influences the *work of art itself*, and retrospectively also connects to *pedagogical work*.

First concept map analysis

Thus, the analysis of the first concept map, which arose after completion of the open coding, again shows the importance of an individual, flexible approach by the teacher to the student, and that the subsequent reflection of the student be accessible to the teacher. What is essential for both the artist and the teacher is that the teacher remain open to new information and impulses coming from the students. This only serves to confirm how important it is to apprehend pedagogical work (Slavík, 2001) and the work of art as a whole, by both students and their teachers.

Another important role was played by language as a medium for transferring information beyond the merely visual. Only in the moment of artwork interpretation or subsequent experiencing by the students does this work surpass the subjectivity border of its creator and become an instrument to be used. On this level, the artwork and architecture approach one another nearly, as do language and its interpretation. Subjective interpretation of the teaching artist experience, but also that of the student, with the work of art, text or actual space--that is what this project strives to follow.

Which reminds us of the idea formulated by L. S. Vygotsky: "*Verbal thinking appears to be a complex dynamic whole, in which the relationship between thought and the word is demonstrated as a movement following a whole range of inner planes, and as a transition from one plane to another*" (Vygotsky, 2004, p. 129-130).

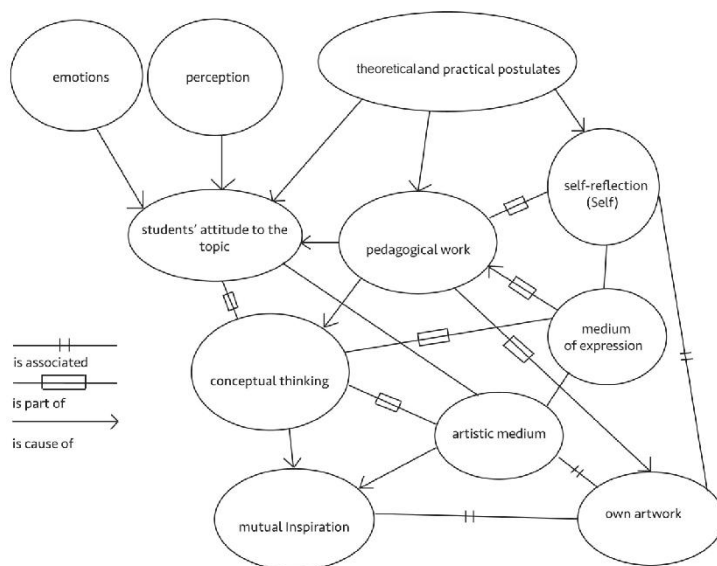


Figure No. 5: Concept map No. 1

Second concept map analysis

When reflecting on the second concept map, the result of axial coding, we closely analyzed the relation of the students to their topic, which in this case was home, or the place where they lived at the moment. Important codes appeared to be *subjectified and objectified space*, as agents / factors of *perceiving and experiencing lived space*.

What is usually understood under “perception” is not just receiving the sensations of perception, or more narrowly only sensations, i.e. certain elementary sensory material, but at the same time a kind of mutual linkage among these, in the form of perceived matter-of-factness. Our perception is influenced not only by what and how we perceive at a given moment, but also by what we have perceived before, i.e. our previous experience. The “space” then once again becomes, in the most common sense, our closest neighborhood surrounding us. The words “neighborhood” and “surrounding” refer to two essential preconditions of a space: that “around” which it finds itself, e.g. the human being in his or her physicality as the center of linkages, and that “which” surrounds man.

What clearly follows from these concept maps is that *experiencing the whole process of creation by students and its subsequent reflection leads to conceptual thinking*. This important component of contemporary art is what students often lack. Thinking about working with a specific medium and its deliberate usage is part and parcel of any

conceptual artwork. That is why we, with the help of verbal communication, led the students to conceptual thinking about the topic, and to its visual communication through different artistic media.

Based on analysis of the concept maps, we arrived at findings indicating the dominance of the code of *subjectified space*. This notion is used by Havel and Mitášová to define space and distinguish the ways of grasping it. To elucidate this notion, we can use a metaphor: the point is *who* experiences the space, what "*his*" space means to him as an individual, what it allows him to do and what it does not allow (Havel, Mitášová, 2004).

This *subjectified space* is influenced, above all, by the following codes: *identification with self, emotions, fragrance, color* and *light*, but also by *nature* and *size*.

The students' statements referred to *objectified space*, which the above authors define as follows: "*Here we are rather interested in what is being experienced, i.e. which characteristics belong to space "per se", independent of individual experience*" (Havel, Mitášová, 2004, p. 154).

Moreover, the above authors add: "*This however is a somewhat artificial distinction between two tendencies, when one or the other can prevail in reflecting on the experienced space; however, they are both present and mutually linked*" (Havel, Mitášová, 2004, p. 154). This is why some codes reflect both these spaces. This is the case with *nature, size, light, and color*.

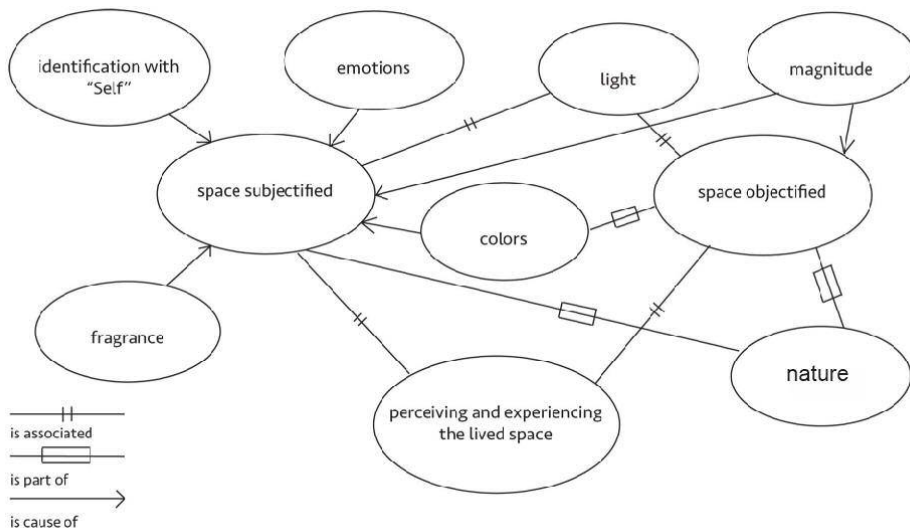


Figure No. 6: Concept map No. 2

Summary of research probe findings

The research findings have shown that most students consider home to be a pleasant place, connected with relaxation, rest or cooking. They identify with their home through their personality, their "Self": *"I love my house. I love everything about it. My room, even though I live somewhere else, is snug and comfortable. It is the place I know best."* This experience verified, we can draw the following conclusions:

(1) Home (as architecture or a space) forms in a sense the students' personality and influences them. (2) Home is an important place influencing life and perception of personalities also in other directions. Students thus perceive and experience this space or architecture with much intensity based on their own positive or negative previous experience. It can be taken as proven that our perception affects the way we interpret the world, but also the other way round, that our interpretation of the world affects the way we perceive our place, our home. Thus the criteria of architecture evaluation are connected with this experienced phenomenon.

This assumption of ours is based upon the statement of Hogenová, who deals with phenomenology of home in her several works.

Dwelling saves the Earth. How? It internalizes it. Like springs of grand rivers bringing to surface their beginnings – resources in sensory form, the same way man, by dwelling on it, brings to Earth internalization, which contemplates in the fire of the hearth like the center of the world, which is there for each dweller. Home is the center of the world, which has been quite forgotten. It is the firm point; it is the referent of movement in the sense of rising into form, which also is meaning. (Hogenová, 2013, p. 265)

One of the students had several interesting observations, and what we found most engaging was things he noticed when investigating his own home. They were *fragrances and sounds*. He described the sound of women's heels he heard in his flat. He was captivated by scents coming from the bathroom in the morning. Let us quote an excerpt from the questionnaire filled in by this participant, which was even slightly critical:

"I perceive space emotionally, through confirming my different specific memories related to individual objects and spaces, which however keep constantly changing. Space influences me. The lesson was interesting for specific reasons, but in fact it did not motivate me much to create something, because I do not really enjoy living in these temporary spaces, which these places in fact are."



Figure No. 7: Artwork by students from the Faculty of Education, University of Maribor

Conclusion

The primary assumption of our research team was that neither “architecture” nor “space” was a frequent topic of study for our sample of students, whether as part of their pedagogical activity or in their own artwork. We saw the reason especially in the students’ lack of information about and experience with these phenomena. Based on our research probe findings, we arrived at the following conclusion: If the teaching artist renders this topic in an innovative way and gives the students an idea even by introducing his or her own artwork, the students show a high level of interest. Thus, we conclude that it is important for students (trainee teachers) to experience space and architecture intensely, based on awareness of their subjective experience, as well as having direct contact with the teaching artist. Existing research findings confirm the *“presence of pedagogical work and the work of art”* as a highly important phenomenon or event in the moment these two co-exist. Richter confirms the idea: “Only a teacher who has personal experience in resolving visual arts problems can articulate teaching units. Motivation that is methodologically and educationally well prepared requires the teaching artist’s own practical work in the field” (Richter, 2017, p. 253). This topic is highly relevant and inspiring for both the art teacher and the artist, making it almost a requirement to be dealt with as part of professional practice, thus handing on his or her experience yet further. We arrived at the conclusion that investigating the phenomenology of architecture in connection with the semiotic concept of art education is indispensable for both the teaching artist and the student. We deem it a perpetual task of architecture to create an existential metaphor that gives our being in the world a concrete shape and structure. Architecture reflects upon, materializes and immortalizes ideas and images of an ideal life. Space and our perception of it make us capable of structuring

and also understanding the shapeless flow of reality and, last but not least, of realizing what we are.

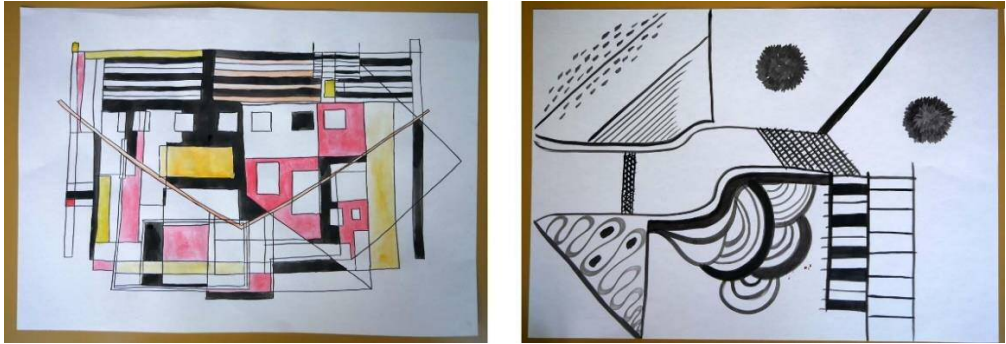


Fig. No. 8: Artwork by students from the Faculty of Education, University of Maribor

What follows each and every experience like this are the actions of remembering, recalling and comparing. Memory plays an essential role as a basis for our recall of space and place. We “redraw” all places we lived, and all spaces we knew, in the embodied memory of our bodies. Our home merges with and grows through our identity, becoming part of our own body and existence (Pallasma, 2012).

There will be a follow-up to the “My Home” research probe, in the form of analysis of two other research probes: “Paths” and “Memory of a Place”. The research findings are meant for art teachers and students at teacher training institutions. We see the contribution of our research to art education theory in verifying the functionality of the new methodology in an actual educational environment and with specific findings that can be used in teaching practice.

Summary

The Project, being part of doctoral studies at the Department of Art Education, Charles University Prague, Czech Republic, has its main focus on knowledge gained through art making in relation to the phenomenon of architecture and the potential for using the research findings about related creative processes in learning situations with university students. The project’s content is grounded in the ongoing public discussion about the impact of architecture on the environment and human life. Inspiration for the topic came from the artistic project “Subjective Urbanism”, whose basic ideas became part of an intensive investigation into the structure of attitudes, values, opinions and their possible changes in teacher-student sessions on the topic of architecture in the contemporary world. The students were invited to

participate in co-creation, which was documented and became part of a folder on reflexive valuation and variants of creative solutions. Our research makes use of combinations of specific forms of qualitative and art-based research. Interpretation of these research findings will lead to enhanced quality of lessons on "mediating architecture" in art teacher training programs.

This research probe was part of my doctoral study visit to the Department of Art Education, University of Maribor, Slovenia, and triggered a program of cooperation between post-graduate students and teachers at the two institutions. The probe of participatory type was conducted with students in their 5th year, that is, Master's Degree students (11 students aged 21 – 24 years). It took place on 23rd October 2017 as part of instruction in art didactics, and lasted 180 minutes. The topic of the workshop during which the probe was carried out was *Architecture / My Home*.

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PREVERJANJE MATEMATIČNEGA ZNANJA

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preverjanje znanja;
dosežki;
interno ocenjevanje;
zaključne ocene

Povzetek/Abstract Matematično znanje se preverja v šoli, na nacionalnih preverjanjih znanja in v okviru mednarodnih raziskav. Preverjanja znanja imajo različne namene, a vseeno naj bi bila do neke mere uglašena. V zadnjih desetletjih se je v slovenskih osnovnih šolah močno povečal delež učencev z nadpovprečnimi ocenami, primerjava zaključnih ocen v 9. razredu osnovne šole in dosežkov na nacionalnem preverjanju znanja pa nakazuje potencialno neobjektivnost šolskih ocen pri matematiki, kar pod vprašaj postavlja njihov smisel. Prav nacionalno preverjanje znanja, katerega dosežki so usklajeni z dosežki mednarodnih raziskav (TIMSS), bi lahko uporabili za usklajevanje kriterijev vrednotenja znanja in postopoma zagotovili objektivnejše in pravičnejše ocenjevanje.

Keywords:
mathematical
knowledge;
national assessment
of knowledge;
achievements;
internal knowledge
assessment;
final grades

Assessing Mathematical Knowledge Mathematical knowledge is assessed at school, in national assessments of knowledge and as part of international research studies. Different knowledge assessments have distinct aims, but they should nevertheless be broadly comparable. In recent decades, Slovenian primary schools have seen a major increase in the share of students with above-average achievements. However, a comparison of final grades in Grade 9 of primary school with results from the national assessment of knowledge indicates the potentially subjective nature of school grades in mathematics, which would seem to question their purpose. The national assessment of knowledge, whose results correspond with the results of international studies (TIMSS), could be used to adjust knowledge assessment criteria and gradually ensure that knowledge assessment becomes fairer and more objective.

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Uvod

S preverjanjem znanja matematike se da najbrž najbolj učinkovito spremljati in posledično izboljševati učenje in poučevanje matematike. V poročilu EACEA/Eurydice (2009) je bilo ugotovljeno, da so nacionalna preverjanja razširjena praksa v evropskih izobraževalnih sistemih. Rezultati nacionalnih preizkusov se uporabljajo za spremljanje in vrednotenje šole ali sistema kot celote. Nacionalni preizkusi se manj pogosto uporabljajo za formativne namene, to je za opredeljevanje posebnih učnih potreb učencev. Tudi predmet preverjanja se lahko razlikuje, preverjajo se lahko osnovna znanja matematike, ključne spretnosti računanja ali pa morda raven doseganja matematične kompetence (EACEA/Eurydice, 2011), vendar bo treba še raziskati, kašen je vpliv nacionalnih testov na uspešnost učencev in šol ter na splošno kakovost učenja (EACEA/Eurydice, 2009).

Glavni cilj nacionalnega preverjanja je oceniti kakovost učnih izidov, ki so bili pridobljeni v šolah. Pomembno je omeniti, da se nacionalno preverjanje razlikuje od zunanjega ocenjevanja, pri katerem je glavni poudarek na posameznem učencu in na oceni njegovega znanja (njegovih dosežkov) zaradi izbora za nadaljnje izobraževanje (Postlethwaite in Kellaghan, 2008). Z nacionalnim preverjanjem naj bi ugotovili:

- kako dobro se učenci učijo v izobraževalnem sistemu (glede na splošna pričakovanja, doseganje ciljev iz učnega načrta ter pripravo za nadaljnje učenje in življenje);
- ali obstajajo očitne prednosti in pomanjkljivosti v znanju in sposobnosti učencev;
- ali določene podskupine v populaciji dosegajo slabše rezultate;
- kateri dejavniki so povezani z dosežki učencev;
- ali se dosežki učencev skozi čas spreminjajo (Greaney in Kellaghan, 2008).

Nacionalna preverjanja znanja naj bi vzdrževala dovolj visoko stopnjo odgovornosti posameznih šol, kar pripomore k razvoju vzgoje in izobraževanja nasploh, h konkurenčnosti znanja v širšem pomenu besede in tudi k mednarodni primerljivosti znanja (Kim, Lee in Kim, 2016).

Še posebej so ocene oziroma dosežki preverjanj deležni takih in drugačnih presojanj ob zaključku osnovnošolskega izobraževanja, saj je učni uspeh odločilen pri vpisu v srednje šole, postavlja pa se vprašanje, ali je plod pravičnega šolskega (internega) ocenjevanja. Za učence je pravično ocenjevanje tisto, ko za enako izkazano znanje prejmejo enako oceno oziroma ko učitelji uporabijo za učence enake kriterije ocenjevanja (Kodelja, 2006). Vendar pa Semen (2010) izpostavlja, da bi morali vsi učitelji v državi vrednotiti enako znanje vseh učencev z enakimi kriteriji, če

predpostavimo, da je pravičnost ocenjevanja določena z *enako oceno za enako znanje*. Toda v praksi se dogaja, da učitelji uporabljajo različne kriterije, saj na ocenjevanje vplivajo različni dejavniki, šolska ocena pa zato poleg izkazanega znanja odraža še mnoge druge prvine, kakor opisujeta Bucik (2001) in Kodelja (2006).

Zaključne ocene učencev niso v skladu z njihovimi dosežki na nacionalnih preverjanjih znanja (NPZ), saj le za nekatere učence velja, da boljša zaključna ocena v šoli predstavlja višji dosežek na NPZ, slabša zaključna ocena v šoli pa nižji dosežek na NPZ, to pa odpira vprašanje, katero izmed teh dveh merjenj znanja je bolj objektivno (Semen, 2010). Dobre merske karakteristike NPZ, zelo visoki razponi odstotnih točk na NPZ za posamezne zaključne ocene, veliko učencev z visokimi zaključnimi ocenami in nizkimi dosežki na NPZ ter slaba kakovost znanja matematike, ki jo na NPZ pokaže veliko učencev z zaključno oceno odlično, kažejo na objektivnejše merjenje znanja z NPZ (prav tam).

Empirična raziskava

Namen raziskave

Namen raziskave je preveriti povezanost zaključnih šolskih ocen pri matematiki v 9. razredu v šolskem letu 2015/16 z dosežki na nacionalnem preverjanju znanja matematike leta 2016. Zanimalo nas je tudi, kako je s t. i. inflacijo šolskih ocen, to je z višanjem deleža učencev z višjimi ocenami.

Metodologija

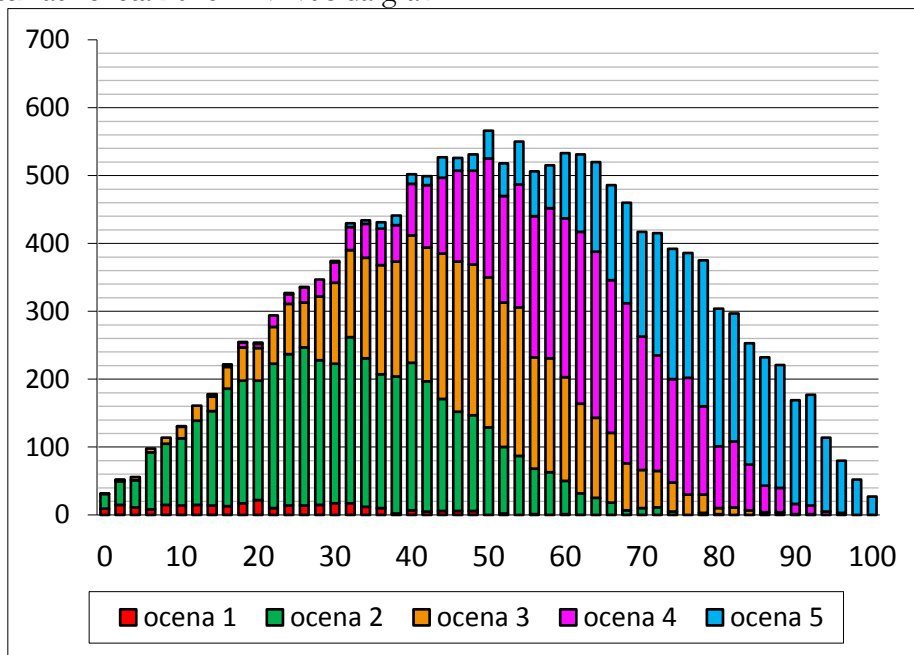
Uporabili smo rezultate nacionalnega preverjanja znanja matematike, ki se vsako leto pripravi v skladu z Izhodišči nacionalnega preverjanja znanja v osnovni šoli (Izhodišča NPZ v osnovni šoli, 2005). Preverjajo se doseganje standardov znanja, ki so zapisani v učnem načrtu, različne vrste in ravni znanja. Leta 2016 je bilo na nacionalnem preverjanju znanja matematike 9 nalog različnih tipov, taksonomskih stopenj in matematičnih vsebin. Indeksi težavnosti posameznih nalog so bili med 0,40 in 0,72, le ena naloga je imela indeks težavnosti 0,34. Indeksi diskriminativnosti nalog so bili z izjemo ene naloge (ki je imela indeks 0,28) med 0,57 in 0,68, kar pomeni, da so naloge dobro razločevale med učenci. Indeks zanesljivosti preizkusa je bil 0,94 (RIC, 2016).

Nacionalnega preverjanja znanja matematike se je v maju 2016 udeležilo 16648 učencev 9. razreda osnovne šole, izmed katerih je imelo pri matematiki 21,0 % zaključno oceno odlično, 25,2 % prav dobro, 24,5 % dobro, 27,5 % zadostno in 1,8 % nezadostno. Učenci so na nacionalnem preverjanju znanja dosegli v povprečju 51,5 % točk (prav tam).

Zaključne šolske ocene pri matematiki smo primerjali tudi z matematičnimi dosežki v okviru mednarodnih raziskav TIMSS v letih 2011 (Mullis, Martin, Foy in Arora, 2012) in 2015 (Mullis, Martin, Foy in Hooper, 2016).

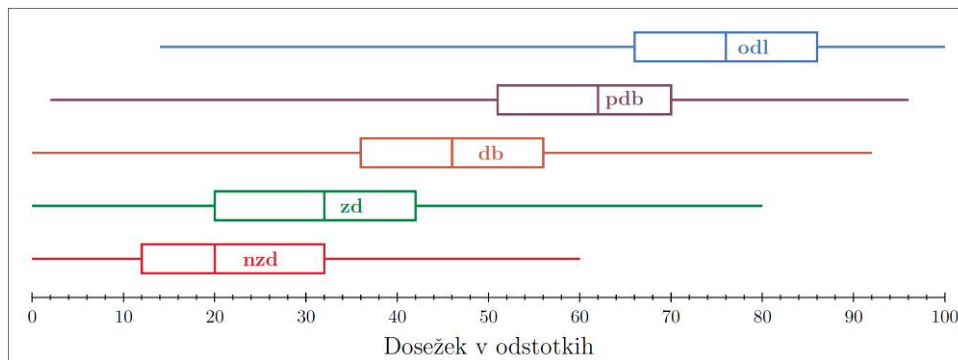
Povezanost šolskih ocen z dosežki na nacionalnem preverjanju znanja matematike

Oglejmo si, kako so bile zaključne ocene pri matematiki v 9. razredu osnovne šole v šolskem letu 2015/16 povezane z dosežki na nacionalnem preverjanju znanja matematike leta 2016. Prvi vtis da graf 1.



Graf 1: Povezanost šolskih ocen pri matematiki in dosežkov na nacionalnem preverjanju znanja matematike 2016 (vir: Ric)

Povezanost ocen pri matematiki z dosežki na nacionalnem preverjanju znanja matematike lahko natančneje ponazorimo z razpršenostjo dosežkov v posamezni skupini učencev, v kateri so učenci z enako zaključno oceno pri matematiki (graf 2).



Graf 2: Razpršenost dosežkov na NPZ glede na posamezno zaključno oceno

Z grafa 2 je razvidno, da se mediane dosežkov posameznih skupin sicer pomikajo v smeri višjega dosežka. Tako je mediana dosežkov učencev, ki so imeli pri matematiki v 9. razredu zaključeno oceno nezadostno, enaka 20 %, mediana dosežkov učencev, ki so imeli oceno odlično, pa 76 %. Variacijski razmiki dosežkov so relativno veliki; pri učencih, katerih zaključna ocena je bila nezadostno, zadostno ali dobro, je najnižji dosežek 0 %, najvišji dosežek pa je 60 % za učence z oceno nezadostno, 80 % za učence z oceno zadostno oziroma 92 % za učence z oceno dobro. Učenci z oceno prav dobro so imeli najnižji dosežek 2 % in najvišji 96 %, učenci z oceno odlično pa najnižji dosežek 14 % in najvišji 100 %.

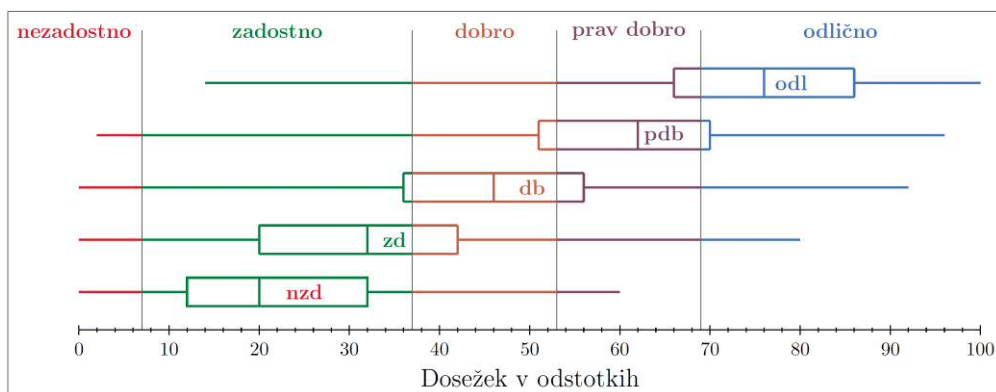
Hipotetične ocene na nacionalnem preverjanju znanja 2016

Nacionalni preizkusi znanja matematike so v šolskih letih od 2001/02 do 2004/05 prinašali oceno, ki je vplivala na končno zaključno oceno pri matematiki v 9. razredu. Tedanja predmetna komisija za matematiko je poudarila, da se je pri porazdelitvi ocen, ki jih je oblikovala na osnovi dosežkov nacionalnega preizkusa znanja matematike, zgledovala po porazdelitvi ocen, ki so jih učitelji matematike dodelili učencem ob zaključku 9. razreda (RIC, 2005). Nacionalna preverjanja znanja od šolskega leta 2005/06 dalje nimajo več te funkcije. Lahko pa hipotetično pogledamo, kako bi se porazdelile ocene, če bi se v letu 2016 držali enakega pravila. Izmed 16648 učencev 9. razreda osnovne šole je 298 učencev (1,8 %) imelo zaključno oceno nezadostno, zato bi postavili, da prav toliko učencev z najnižjimi dosežki na NPZ prejme hipotetično oceno nezadostno. Glede na konkretne dosežke so potrebne korekcije, saj je 238 učencev na NPZ doseglo 6 % vseh točk ali manj, 352 učencev pa 8 % vseh točk ali manj. Za število učencev, ki so imeli pri matematiki zaključno oceno nezadostno, to je 298, velja $238 < 298 < 352$ in odločimo se za »manj strogo« različico ter hipotetično oceno nezadostno damo učencem, ki so dosegli 6 % vseh točk ali manj. Če na podoben način postavimo meje še za druge hipotetične ocene, bi bila spodnja meja za oceno zadostno 8 % točk, za oceno dobro 38 %, za oceno prav dobro 54 %, za oceno odlično pa 70 %. V preglednici 1 podrobneje predstavimo, koliko učencev (f) vsake skupine učencev s posamezno zaključno oceno bi prejelo določeno hipotetično oceno in koliko odstotkov (f %) učencev skupine to predstavlja.

Preglednica 1: Povezanost zaključnih ocen učencev 9. razreda pri matematiki z dosežki na NPZ oziroma pripadajočimi hipotetičnimi ocenami

Zaključna ocena v 9. razredu	Hipotetična ocena									
	Nezadostno		Zadostno		Dobro		Prav dobro		Odlično	
	f	f %	f	f %	f	f %	f	f %	f	f %
Nezadostno	43	14,43	219	73,49	34	11,41	2	0,67	0	0,00
Zadostno	180	3,93	2731	59,64	1290	28,17	348	7,60	30	0,66
Dobro	14	0,34	1042	25,58	1645	40,38	1126	27,64	247	6,06
Prav dobro	1	0,02	267	6,36	938	22,35	1803	42,98	1187	28,29
Odlično	0	0,00	29	0,83	203	5,80	822	23,48	2447	69,89
Skupaj	238	1,43	4288	25,76	4110	24,69	4101	24,63	3911	23,49

Iz preglednice 1 je razvidno, da bi učenci, ki so imeli zaključno oceno nezadostno, prejeli hipotetične ocene od nezadostno do prav dobro, učenci, ki so imeli zaključno oceno odlično, pa hipotetične ocene od zadostno do odlično. Učenci, ki so imeli zaključne ocene zadostno, dobro ali prav dobro, bi prejeli hipotetične ocene od nezadostno do odlično. Pokažejo se torej zelo visoki razponi odstotnih točk na NPZ za posamezne zaključne ocene, veliko učencev z visokimi zaključnimi ocenami pa izkazuje nizke dosežke na NPZ. Nekoliko nazorneje lahko to vidimo na grafu 3.



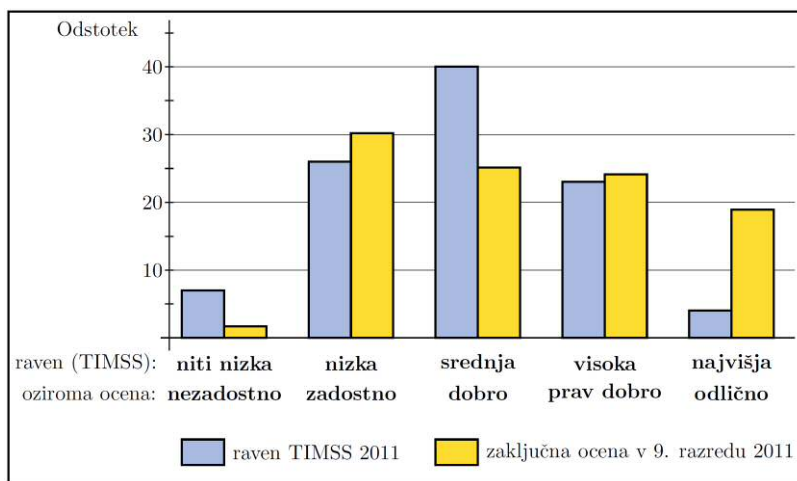
Graf 3: Hipotetične ocene v povezavi z zaključnimi ocenami

Ti visoki razponi odstotnih točk za posamezne zaključne ocene posledično vplivajo na to, da se hipotetične ocene, ki pripadejo nekaterim učencem, lahko precej razlikujejo od zaključnih, čeprav se hipotetične ocene oblikujejo v smislu zaključnih

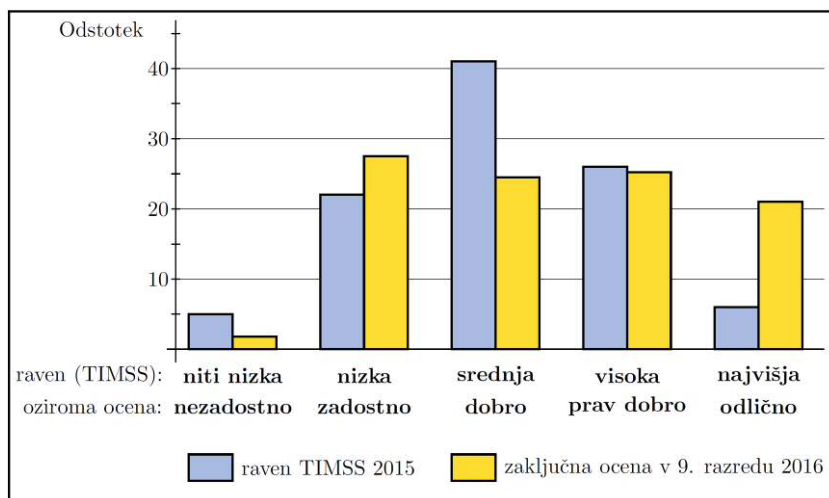
ocen. Lahko bi rekli, da nam vsak učenec preda svojo zaključno oceno in tako zbrane zaključne ocene ponovno razdelimo kot hipotetične, pri čemer veliko učencev ne prejme take ocene, kot jo je predal, nekateri izmed njih pa prejmejo celo bistveno drugačno oceno. S tem se odpirajo vprašanja o (ne)pravičnosti oziroma o (ne)objektivnosti zaključnih ocen. To je le en vidik (ne)pravičnosti oziroma (ne)objektivnosti, saj se delež posameznih zaključnih (internih) ocen zgolj prenese na dosežke NPZ, ne ozira pa se na t. i. inflacijo pri internem ocenjevanju (Zupanc in Bren, 2010). Že Jurman (1989) je opozarjal na inflacijo, ki se je kazala v višanju deleža učencev z višjimi ocenami, upadanju kakovosti znanja in pritiskih na strokovne delavce, da znižajo kriterije pri ocenjevanju znanja.

Inflacija šolskih ocen

Inflacija ocen se lepo pokaže, če primerjamo zaključne ocene pri matematiki z matematičnimi dosežki v okviru mednarodne raziskave TIMSS v letih 2011 in 2015 oziroma 2016. Dosežki se v okviru TIMSS razdelijo v pet ravni: niti nizka, nizka, srednja, visoka in najvišja raven; primerjali jih bomo z ocenami nezadostno, zadostno, dobro, prav dobro in odlično. Na grafu 4 je primerjava matematičnih dosežkov v okviru mednarodne raziskave TIMSS v letu 2011 (Mullis, Martin, Foy in Arora, 2012), v katero so bili zajeti tedanji učenci 8. razreda, in zaključnih ocen pri matematiki v 9. razredu osnovne šole. Na grafu 5 pa je primerjava matematičnih dosežkov v okviru mednarodne raziskave TIMSS v letu 2015 (Mullis, Martin, Foy in Hooper, 2016), v katero so bili zajeti učenci 8. razreda, in zaključnih ocen, ki so jih leta 2016, torej v 9. razredu osnovne šole, pri matematiki dosegli isti učenci.

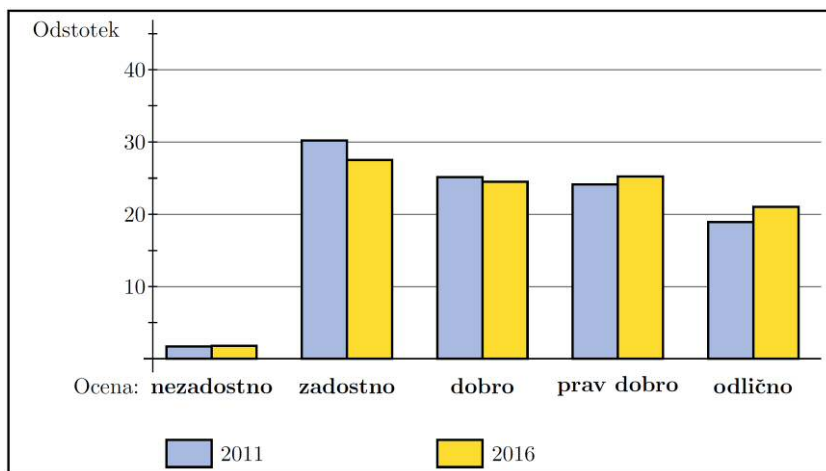


Graf 4: Matematični dosežki učencev leta 2011 na TIMSS in zaključne ocene pri matematiki v 9. razredu osnovne šole



Graf 5: Matematični dosežki učencev leta 2015 na TIMSS ter leta 2016 v 9. razredu

Če se osredotočimo le na zaključne ocene v letih 2011 in 2016, se zdi, da se trend inflacije še ni ustalil. Z grafa 6 razberemo, da je delež učencev z zaključno oceno nezadostno bolj ali manj stalen, medtem ko se delež t. i. *nadpovprečnih učencev*, kakor učence s prav dobrim ali odličnim uspehom opredeljuje Zupanc (2006a), še povečuje.



Graf 6: Deleži zaključnih ocen pri matematiki v 9. razredu osnovne šole v letih 2011 in 2016

Kako do normalne porazdelitve ocen

Že predmetna komisija za matematiko, ki je v šolskih letih od 2001/02 do 2004/05 pripravljala nacionalne preizkuse znanja matematike, je leta 2002 ob objavi prvih rezultatov izrazila nezadovoljstvo, ker sposobnejši učenci oziroma učenci z visokimi dosežki niso mogli izkazati svojega optimalnega znanja (RIC, 2005). V šolskem letu 2004/05, ko so bile zadnjč podeljene ocene na osnovi dosežkov na NPZ, je namreč 2,29 % učencev prejelo oceno nezadostno, 18,26 % oceno zadostno, 24,72 % dobro, 30,62 % prav dobro in 24,11 % odlično, pri čemer je treba upoštevati, da so odstotki temeljili na porazdelitvi zaključnih ocen pri matematiki v 9. razredu osnovne šole (prav tam).

V nacionalne preizkuse znanja je komisija postopoma vključevala tipe nalog, ki jih v dotedanjih učbeniških gradivih ni bilo in jih učitelji (še) niso vključevali v proces poučevanja, na primer naloge, ki jih rešujemo s kompleksnim in problemskim znanjem, naloge s preveč podatki ipd. Predmetna komisija je na ta način želela v kulturo preverjanja vnesti širše razumevanje matematičnega znanja – sčasoma naj bi bile v preizkuse vključene naloge, s katerimi bi ugotavljali opravilno znanje (prav tam) ter s tem dali priložnost sposobnejšim učencem, da bi se izkazali znotraj (pre)široke množice prav dobrih in odličnih.

Od šolskega leta 2005/06 je bolj poudarjen formativni namen preverjanja – pomembna je informacija, ki jo o pričakovanem znanju in doseganju ciljev daje NPZ vsem udeležencem: učencem, staršem, učiteljem, šolam in drugim ustanovam, ki skrbijo za izobraževanje (Magajna in Žakelj, 2011). Z dosežki učencev na NPZ naj bi učitelji pridobili dodatne informacije o znanju svojih učencev in o njihovem doseganju standardov iz učnih načrtov, ob strokovni analizi nalog in dosežkov pa naj bi učitelji kritično ovrednotili svoje poučevanje in usklajevali svoje kriterije vrednotenja znanja s kriteriji drugih učiteljev (Izhodišča NPZ, 2005). Medtem ko so bili preizkusi znanj do leta 2005 bistveno občutljivejši na spodnjem delu ocenjevalne lestvice, je od leta 2006 občutljivost enakomernejša (Magajna in Žakelj, 2011).

Čeprav je torej med posrednimi cilji NPZ zagotavljanje bolj enotnih kriterijev učiteljevega ocenjevanja (Izhodišča NPZ, 2005), ta cilj še zmeraj ni dosežen. Dosežki nacionalnih preverjanj znanja matematike so vsako leto dokaj normalno porazdeljeni in kot taki nakazujejo, da bi se morale tudi ocene temu prilagoditi. Trenutno še ni znano, ali bo prišlo do sprememb pri NPZ, se pa kot ena izmed možnosti nakazuje, da bi bil dosežek nacionalnega preverjanja znanja matematike le ena izmed ocen, ki naj bi poleg učiteljevih ocen vplivala na zaključno oceno pri matematiki. Če bo obveljala ta možnost, bo vpliv dosežka nacionalnega preverjanja na zaključno oceno relativno omejen, a bo vendarle nakazoval trend k normalnejši

porazdelitvi. Seveda je jasno, da omenjenega cilja ne bomo dosegli, če bomo dosežke prelevili v ocene v smislu (pričakovanih inflatornih) zaključnih ocen, pač pa bi bilo treba dosežke na NPZ bolj »normalno« preoblikovati v ocene. Tedaj bi lahko dosežke naših učencev oziroma ustrezno (normalno) oblikovane ocene z NPZ primerjali z dosežki učencev iz drugih držav. Če pogledamo, koliko odstotkov učencev se uvrsti na posamezno mesto v petstopenjski lestvici (kar bi lahko ustrezalo ocenam od *nezadostno* do *odlično* ali ravnem znanja od *niti nizka* do *najvišja*) v nekaterih državah (preglednica 2), ugotovimo, da se z odstotki »inflatornih« ocen seveda ne moremo primerjati.

Preglednica 2: Odstotki učencev po posameznih mestih v petstopenjski lestvici v nekaterih državah (vir: Zupanc, 2006b)

Država	Raven znanja				
	Niti nizka	Nizka	Srednja	Visoka	Najvišja
Švedska	13	22	29	27	9
Anglija	8	17	48	21	6
ZDA	9	23	39	23	6
Kanada – Ontario	12	28	35	24	1
Kanada – Quebec	11	18	34	36	1
Avstralija – ACT	11	24	36	21	8

Zaključek

Dosežki učencev na NPZ dajejo pomembne informacije učencem, staršem, učiteljem, šolam in strokovnim institucijam (Izhodišča NPZ, 2005), sami po sebi pa seveda ne odpravljajo zagat (ne)objektivnosti in (ne)pravičnosti. Vsak, ki so mu informacije namenjene, bi moral imeti svoj del odgovornosti in dolžnosti, da poseže v postopno razreševanje problemske situacije, v kateri smo se kot družba znašli. Že desetletja prihajajo opozorila o naraščanju števila »nadpovprečnih učencev«, ki zaključujejo osnovnošolsko izobraževanje, in vrstijo se vprašanja, ali niso morda vzgojno-izobraževalni cilji postavljeni prenizko (Zupanc, 2006b). Na vprašanje, ali smo se v Sloveniji držali usmeritve o spodbujanju vključevanja čim širšega dela populacije mladih v splošno ali strokovno srednje izobraževanje in o povečanju prehodnosti med različnimi segmenti izobraževalnega sistema *ob obranjanju ravnih zahtevnosti*, kakor je zapisano v Beli knjigi (1995), posredno odgovarja kar (nova) Bela knjiga (2011), v kateri najdemo podatke, ki so zgovorni sami po sebi:

- 54,9 % anketiranih učiteljev na gimnazijah ocenjuje, da so učitelji, ki poučujejo na njihovi šoli, v zadnjih desetih letih pri ocenjevanju zelo znižali ali znižali kriterije zahtevnosti;
- 30,6 % učiteljev meni, da so učitelji le nekoliko znižali kriterije;

- 11,1 % učiteljev meni, da učitelji v zadnjih desetih letih pri ocenjevanju niso znižali kriterijev;
- 48,6 % ravnateljev ocenjuje, da so učitelji pri ocenjevanju nekoliko znižali kriterije ocenjevanja;
- 24,3 % ravnateljev meni, da so jih zelo znižali ali znižali;
- 27,0 % ravnateljev pa meni, da jih niso znižali.

Tudi v drugih državah se izkazuje, da so učitelji na splošno bolj »radodarni« in da imajo učenci nekoliko višje šolske (interne) ocene od ocen ali dosežkov, ki jih pridobijo na nacionalnih preverjanjih, kar je še posebej značilno za ocene pri matematiki (Lindahl, 2007), a razlike še zdaleč niso tako izrazite kot v Sloveniji. Z »radodarnostjo« lahko prestopimo prag objektivnosti in pravičnosti – če že ne znotraj posamezne šole, pa skoraj zagotovo med šolami. Zato je treba upoštevati nacionalno preverjanje znanja kot pomemben element ugotavljanja in zagotavljanja kakovosti šolskega dela (Gosak, Ivanuš Grmek in Čagran, 2016). Prav zaradi tega, ker je nacionalno preverjanje znanja eden izmed pomembnih pokazateljev znanja učencev in ker poleg znanja učencev pri predmetih, ki se preverjajo, pokaže tudi kakovost celotnega vzgojno-izobraževalnega sistema (Škalič in Ivanuš Grmek, 2017), bi bili lahko dosežki nacionalnega preverjanja znanja dobra osnova za postopno deflacijo pretiranega deleža nadpovprečnih učencev, hkrati pa bi lahko zagotavljali objektivnejše in pravičnejše ocenjevanje.

Summary

Assessing mathematical knowledge enables us to monitor and thus improve the learning and teaching of mathematics. A special role is played by national assessments of knowledge, a widespread practice in European education systems. The main goal of a national assessment of knowledge is to evaluate the quality of the learning outcomes achieved in schools. School grades and assessment results are scrutinized particularly at the end of primary-school education in Slovenia, since children's final grades can be decisive in their enrolment in secondary school. Thus, the question arises whether the grades are the product of a fair process of (internal) school assessment. Students' final grades in mathematics do not accord with their achievements in the national assessment of knowledge, which measures knowledge more objectively than school grades. In 2016, 16,648 Year 9 students participated in the national assessment of mathematical knowledge. Their final grades in mathematics were as follows: excellent (21.0% of the students); very good (25.2%); good (24.5%); satisfactory (27.5%) and failing (1.8%). In the national assessment of knowledge, they earned an average mark of 51.5%. The range of the achievements was relatively wide: the students whose final grades were failing, satisfactory or good

scored between 0% and 60% (those with a failing grade), between 0% and 80% (those with a satisfactory grade) and between 0% and 92% (those with a good grade). Students with a very good final grade scored between 2% and 96%, and students with a grade of excellent, between 14% and 100%. Clearly, this raises the question of the (un)fairness and (non-)objectivity of the final grades.

Moreover, a comparison of final mathematics grades and the TIMSS 2011 and 2015 international results reveals the problem of grade inflation: based on the final grades, the share of above-average students (i.e. students with grades of very good or excellent) is disproportionately high. Although the indirect objectives of the national assessment of knowledge include ensuring more unified criteria for teachers' assessment of students' knowledge, this has still not been achieved – despite decades of warnings regarding the increasing number of above-average students completing primary-school education, and despite continuous questions about the likelihood of educational goals being set too low. We have evidently not followed the course of encouraging participation by as many students as possible in general and technical or vocational education and of enhancing the transition among various segments of the education system, *while also retaining the level of difficulty*, as stated by the White Paper on Education in the Republic of Slovenia.

In other countries, too, teachers seem to be generally more “generous”, and students achieve somewhat higher school (internal) grades compared to external assessment results, which is especially true of grades in mathematics. Nevertheless, the differences are far less significant than in Slovenia. Such “generosity” may take us beyond the bounds of objectivity and fairness – if not within individual schools, then almost certainly among schools in general. This makes it crucial to take account of the national assessment of knowledge as an important element in the assessment and assurance of school work quality. Because the national assessment of knowledge is an important indicator of students' knowledge and because, in addition to students' knowledge of tested subjects, it also indicates the quality of the entire education system, the results of the national assessment of knowledge could provide a sound basis for a gradual deflation of the excessive share of above-average students, while also ensuring a form of knowledge assessment that is fairer and more objective.

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NAVODILA AVTORJEM

Osnovni namen revije je povezati širok spekter teoretičnih izhodišč in praktičnih rešitev v izobraževanju ter tako spodbujati različne metodološke in vsebinske razprave. Uredniški odbor združuje strokovnjake in raziskovalce iz več evropskih držav in s tem želi ustvariti možnosti za živahen dialog med raznovrstnimi disciplinami in različnimi evropskimi praksami, povezanimi z izobraževanjem.

Revija za elementarno izobraževanje torej objavlja prispevke, ki obravnavajo pomembna, sodobna vprašanja na področju vzgoje in izobraževanja, uporabljajo primerno znanstveno metodologijo ter so slogovno in jezikovno ustrezni. Odražati morajo pomemben prispevek k znanosti oziroma spodbudo za raziskovanje na področju vzgoje in izobraževanja z vidika drugih povezanih ved, kot so kognitivna psihologija, razvoj otroka, uporabno jezikoslovje in druge discipline. Revija sprejema še neobjavljene članke, ki niso bili istočasno poslani v objavo drugim revijam. Prispevki so lahko v slovenskem, angleškem ali nemškem jeziku.

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2. Besedilo prispevka naj ne presega 8.000 besed, vključno s povzetki, literaturo in ključnimi besedami.
3. Naslov prispevka naj ne presega 15 besed in naj bo v slovenskem in angleškem jeziku.
4. Prispevek naj ima na začetku povzetek v slovenskem jeziku ter njegov prevod v angleškem jeziku (oziroma obratno) in naj ne presega 100 besed. Za povzetkom naj bo 5 ključnih besed. Poleg povzetkov naj prispevek na koncu prispevka, pred literaturo, vsebuje daljši povzetek (500-700 besed) v angleščini, če je članek napisan v slovenščini.
5. V prispevku ne uporabljajte ne sprotnih ne končnih opomb.
6. Vire navajajte v skladu z American Psychological Association (APA) standardom. V literaturo vključite samo v tekočem besedilu navedene vire, ki jih uredite po abecednem vrstnem redu.
7. V posebnem dokumentu pošljite naslednje podatke: ime in priimek avtorja, akademski naziv, organizacijo, kjer je avtor zaposlen, elektronski naslov, naslov bivališča in naslov prispevka.

Primeri:

Knjige: priimek, začetnica imena avtorja, leto izida, naslov, kraj, založba.

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Članki v revijah: priimek, začetnica imena avtorja, leto izida, naslov prispevka, ime revije, letnik, številka, strani.

Planinšec, J. (2002). Športna vzgoja in medpredmetne povezave v osnovni šoli. *Šport*, 50 (1), 11–15.

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Fošnarič, S. (2002). Obremenitve šolskega delovnega okolja in otrokova uspešnost. V M. Juričič (ur.), *Šolska higiena: zbornik prispevkov* (str. 27–34). Ljubljana: Sekcija za šolsko in visokošolsko medicino SZD.

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