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Art and Design Strategies of Identical Twins

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Summary: *The presented research discusses art and design strategies of identical twins in different art fields: drawing, painting and sculpting. In this research we used case study. The research sample included a pair of identical twins; two elementary school girls of age 12. We analyzed the data, acquired by observing the pupils during their artistic creation, and studied art and design of the girls' creative work.*

We established that the artistic expression of identical twins is similar at drawing and painting. At sculpting, the two final artworks visually differ, but the girls used similar art and design strategies.

Keywords: *identical twins, art education, design strategies, elementary school, artistic Creation*

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Strategije likovnog oblikovanja jednojajčanih blizanaca

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Sažetak: *Prikazano istraživanje bavi se strategijama likovnog oblikovanja jednojajčanih blizanaca u različitim likovnim područjima: crtanju, slikanju i izradi kipova. U istraživanju smo primijenili studiju slučaja. Istraživački uzorak čini par jednojajčanih blizanki — dvije dvanaestogodišnje djevojčice. Promatrajući likovno stvaranje dviju učenica, analizirali smo i proučavali likovno oblikovni i likovno stvaralački rad jednojajčanih blizanki.*

Utvdili smo da je likovno izražavanje jednojajčanih blizanaca u crtanju i slikanju slično. U izradi kipova likovni se radovi izgledom razlikuju iako su djevojčice primjenjivale istu strategiju likovnog oblikovanja.

Ključne reči: *jednojajčani blizanci, likovna kultura, strategije oblikovanja, osnovna škola, likovno stvaralaštvo*

1. Introduction

Studies of twins consistently show that twins are anything but a typical sample of population; biologically, psychologically or during the educational process. Twin studies that examine twins as pairs and study their individual and psychological characteristics are very rare. Twins can be divided into three populations: the population of identical twins, fraternal twins of the same sex and fraternal twins of the opposite sexes. In this research, we focus on the population of identical twins. Statistics show that only 12-14 twins are born per 1000 births. On a global scale, identical twins occur three-and-a-half times in every 1000 births. It is distinctive of identical twins to always be of the same sex. Their genetic code is identical, as they develop from the same zygote, which divides into two embryos after fertilization (Milčinski, 1998). The number of multiple pregnancies is rapidly increasing. Experts believe that the causes can be found in fertility medication and in vitro fertilization, which can increase the chance of double fertilization. Črepinšek (2007) says that scientists have confirmed strong bonds between twin pairs. These bonds are much stronger than the ones between two peers, which are born at the same time and then live in the same family. Twins have a greater need for imitating each other, as they have already lived together in the uterus. In her research, Brodar (1967) sums up the thoughts of Luigi Gedda, who stresses the advantage of an identical twin over a singleton, as the twin has an opportunity to better know oneself through his twin brother/sister. The twin can also have lesser abilities and various impediments, which can be eliminated with proper upbringing.

Research (Mittler, 1971) has shown that twins achieve below-average results on intelligence tests and tend to achieve such results also in physical and intellectual development. The differences in speech and language development in twins are also greater than the differences in intelligence. Twins use a more reduced vocabulary and simpler sentences than non-twin children. Mittler (1971) establishes that language differences are the most conspicuous between the ages of 2 and 5 years and get reduced with age. Recent researches (Rutter et al., 2003) have also shown that twins fall behind their peers in language development by three weeks. Sahin et al. (2003) came to similar conclusions; they established that the development of twins did not differ statistically in comparison with other children; however differences occurred at language tests. Josipović Smojver (2007) used a case study of two pairs of identical twins to establish how an individual twin's identity is expressed through speech from the age of 1 to 8 years. The research has shown that there are differences in the speech of twins. One of the twins uses more phrases every day as the other one follows them and is slower in development. Josipović Smojver (2007) determines four stages in the developments of twin identity: (1) twins have collective identity; (2) twins distinct

their personal identity from the identity as a twin pair; (3) personal identity is established within phrases (use of words me, my, mine ...); (4) final stage where the identity of both twins is formed and both identities differ from each other. This is when personal identity of both twins is established. Research findings show that the identity development in twins is different than in non-twins. In her research, Brodar (1967) mentions that intellectual abilities are not necessarily reduced in twins and sums up the words of Zazzo, who says that recurrent mental retardation in twins is most likely the consequence of birth injuries rather than a consequence of unsuitable environment and heredity.

2. Methodology of the research

2.1. Research purpose and object

During the research, we were interested in the artistic expression of an identical twin pair; what are the similarities and the differences and what are their art and design strategies at drawing, painting and sculpting. Research objects will help us understand the similarities and the differences of art and design strategies and processes of twins at art creation in different art fields.

2.2. Research method

For our research, we used a qualitative paradigm of scientific-pedagogical research with an active observation of the girls' art creation process. We used descriptive, comparative and qualitative method. Qualitative researching is "a path of discovery, where the researcher collects, organizes and interprets information, acquired from people, using their eyes and ears as filters" (Lichtman, 2009, p. 5). In these researches, the data is processed and analyzed verbally without using measurement procedures, which provide numbers, and without any operations with these numbers (Mesec, 1998, p. 26). In the art education field, qualitative researches are more heuristic and are more active within the world of the art teaching praxis (O'Farrell & Meban, 2005). As it follows the process of making an artwork, qualitative approach is also the most appropriate for observing the construction of an artwork and thus determining the manner of creating an artwork. Document analysis technique – especially visual material – appears as the most suitable to accompany the observation. Photographs are being used in qualitative empirical studies with increasing frequency. Peez (2006) establishes that photographs are not used as the sole research material, but as a complement to observations, transcriptions of interviews or students' written reports about art or describing of their own artwork. Occasional, yet planned photographing of persons who are being studied provides reliable data for analyzing art and

design strategies of children. Most suitable are the natural portraits, where people are in their natural positions, performing their chores and usually do not even know they are being photographed (Scott, 1990; Vogrinc, 2008). Photographs have progressed from their primarily illustrative role and are recognized today as an independent and autonomous research material. The analysis of visual materials is carried out in the same way as text analysis, since photographs also tell a story. For qualitative studies, photographs must be taken in such way that studied elements are clearly visible.

2.3. Research sample

In this research, we used case study. The research sample is represented by a pair of identical twins; two girls from the 6th grade at an elementary school with a nine-year program. The girls are 12 years old.

2.4. Data acquisition and analysis procedures

Data was acquired by observing the pupils during artistic creation and comparing their artwork. We chose data analysis as an independent data acquisition technique. We analyzed the photographs taken during the girls' work procedure. An elaborated class preparation was made and carried out three times for two 45-minute periods in the 6th grade. Thus we acquired two paintings and one sculpture from each girl. For tempera painting technique we chose an imaginary sea theme. Imaginary outer space theme was also chosen for cane painting and coloured ink painting. For sculpting technique the girls depicted their self-portraits. Altogether we acquired four surface design artworks and two sculptures.

The girls were creating these artworks for three weeks in a row. The task for the first week was to make a pencil drawing on the theme of a thousand miles under the sea and colour it with tempera. First, we observed the pencil drawing and tried to establish similarities and differences between the girls' stencil expression. Then we observed how they coloured the drawing with tempera paints. We did not want to affect their choice of colours or painting technique. In the second week, the girls draw a picture using a cane and black ink on the theme of wonders of the universe and then used coloured ink to paint it. In the third week, they made their self-portraits from clay.

It is important to stress that we engaged the whole class in the art tasks, so the observed girls (identical twins) would not feel exposed. We took photographs of other pupils' work procedures and thus reduced possible disruptive factors, which could affect the observed girls' work. The girls were not sitting together in class, so they could not observe each other during work. At painting techniques,

there were four different formats available to the girls as well as other pupils to choose from as a mat board for their artwork. Each pupil chose their format individually, so that we could prevent possible arrangements about the format between the observed girls. They could also choose how would they turn their piece of paper; horizontally or vertically. We described the girls' finished artworks based on the notes and photographs we took regularly during their work. We thoroughly inspected each artwork, analyzed it and presented the making of it from the beginning to the end. We compared their artwork and try to establish similarities and differences between the identical twin pair.

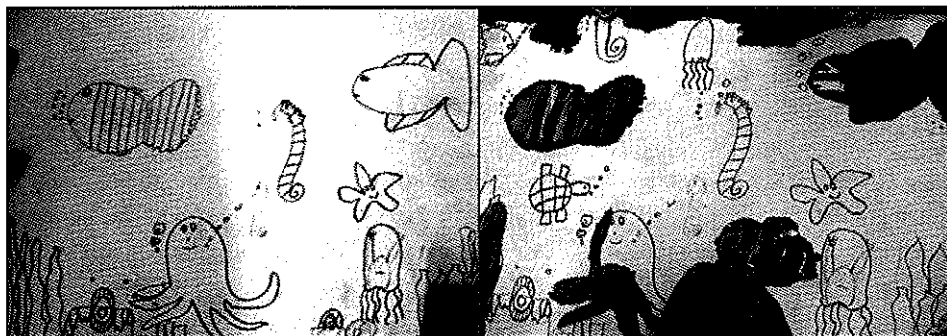
3. Results and interpretation

3.1. *The first art task: A thousand miles under the sea*

In the first art task we originated from the motif in the opening motivation. We observed the photographs of different animals and plants that live in the see on the laptop computer and try to talk and revive our imagination about the underwater world.

3.2. *The process of making a drawing using tempera colours of Girl A*

Amongst four different paper formats Girl A used A3 size, which in arts class is the most usual and frequently used. She turned the paper horizontally. The pupil started to draw from left to right. She arranged the elements throughout the entire surface, so that they were balanced. Firstly she depicted a striped fish on the left side and continued with the algae and some kind of a chest in the lower left corner. Then she depicted an octopus and all the other animals, and drew the algae in the lower right corner, which she used to balance out the composition. There are seven animals on her sketch; two fish, an octopus, two sea snakes, a starfish, and a jellyfish, all turned to the left.

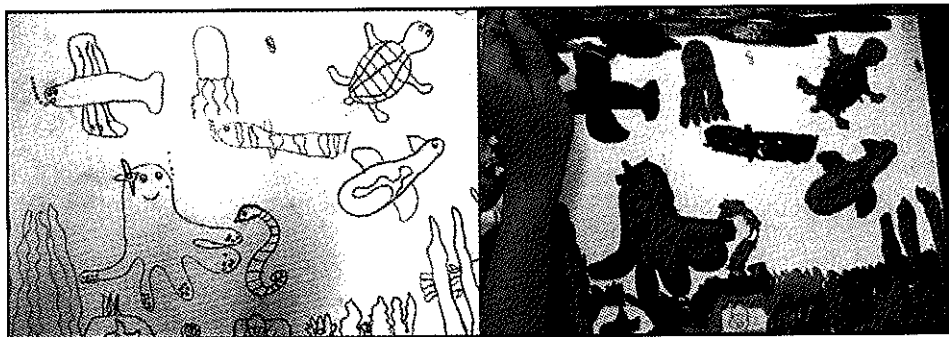


Picture 1: *Initial drawing of Girl A on the theme a thousand miles under the sea and her continuation*

She enriched her drawing and added five more animals; a fish, a jellyfish, a sea snake, and a turtle (picture 1). She turned a smaller fish in the upper left corner and the turtle to the right, turning them differently than all the other animals. Then she started to paint. We can see in the picture on the right (picture 1) that the girl is painting with her right hand, which indicates she is right-handed. The pupil painted the animals in warm and cool colours. She framed some figures first and then filled them with colour; others were filled with colour without any framing. She was not very particular with her painting, as she painted over some forms and added a few details. She applied a dense tempera colour in her painting.

3.3. The process of making a drawing using tempera colours of Girl B

Girl B also used A3 paper format and turned it horizontally, similar as her sister. She started drawing in the middle of the paper, slightly different from her twin sister. She then moved from the centre to the side and developed her drawing from left to right. She arranged the elements throughout the entire surface, too. The drawing (picture 2) is quite full; elements are added to fill in the surface. If we compare the drawings of both girls we can see they depicted similar animals, like an octopus, a sea snake, a jellyfish, a starfish, fish, and algae. The elements in both drawings are similarly arranged throughout the paper.



Picture 2: *Initial drawing of Girl B on the theme a thousand miles under the sea and her continuation*

When Girl B started to paint, she painted all the elements that she previously outlined with a pencil. She framed some of the animals, but not all. It can be seen on the right side of the picture (picture 2) that she holds the brush in her left hand. She is left-handed and, in that matter, different from her sister. When she was painting she was very relaxed and fast. She painted the octopus, the jellyfish, the fish on the right, and algae in the lower right corner using warm colours. For the turtle, the sea snake, the fish (up left), as well as the algae in the lower left corner

she used cool colours. The elements in warm colours are a magnificent contrast to the cool background. In some areas she applied dense and in other tempera colours diluted with water, and thus created the blue sea in the background.

3.4. The comparison of the finished artworks of Girls A and B

In the picture we can see the finished works from both girls. If we compare both works, we can see that the background in the painting of Girl A is painted in lighter blue-green shades, while the background in the painting of Girl B is darker. Warm-cool contrast is clearly seen with both girls. The elements in the painting of Girl A are painted in a circle. The middle of the painting is empty, emphasized with darker green colour that she used to paint over the sea snake.



Picture 3: *Finished artworks of Girls A and B on the theme
a thousand miles under the sea*

The scene in the painting of Girl B is chaotic. The elements in the painting are blended in with the background. Her work is very picturesque. The warm and cool colours take turns and complement each other. The art expression of both girls is relaxed; they used previously made drawing but did not quite stay with it. During the painting process they changed, added, or left out many things. The shape of some animals that was very similar on the drawings (an octopus, a seahorse) changed quite a bit during painting; some animals were even painted over with the colour, like the seahorse of Girl A. Besides that, we can see that all the animals in painting A are turned to the left, while in painting B some are turned to the right, which can be the result of the left-handedness of Girl B.

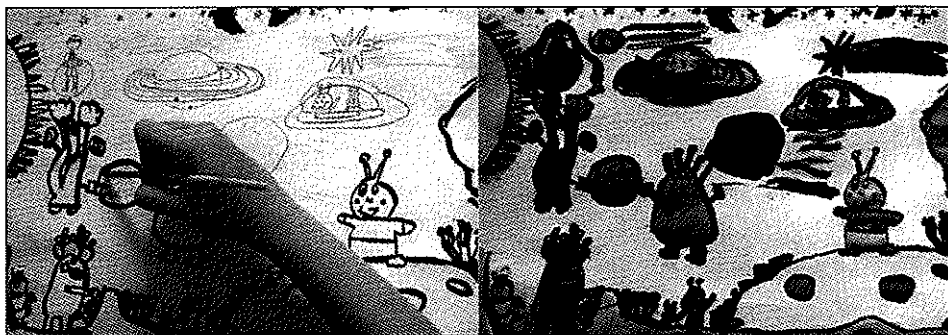
3.5. The second art task: Wonders of the universe

The second art task was carried out the second week and it lasted two 45-minutes periods. The pupils used black ink and cane to draw imaginary world

on the theme wonders of the universe. Later they enriched their drawings with coloured ink using the colours they picked out themselves. We motivated the pupils by showing them photographs of the planets, stars, the sun, flying objects, and astronauts in space. We also talked about unusual creatures and monsters that do not live on planet Earth.

3.6. The process of making a drawing using coloured ink of Girl A

You can see the drawing of Girl A in the picture (picture 4) that was created on the theme wonders of the universe using black ink and cane. From the four possible paper formats she used a standard A3 size and turned it horizontally. The pupil arranged the elements throughout the entire surface. She created very interesting creatures, planets, comets, the sun, and stars that float in the air. At the bottom of the paper she drew a planet with a variety of creatures. Pupils were able to use coloured ink to paint their drawings. Ink was diluted with water and applied on the already made drawings. During colouring pupils followed the instructions to dilute coloured ink with water and thus create an interesting effect. They also agreed not to paint the whole surface, but to leave certain parts of the drawing unpainted, white.



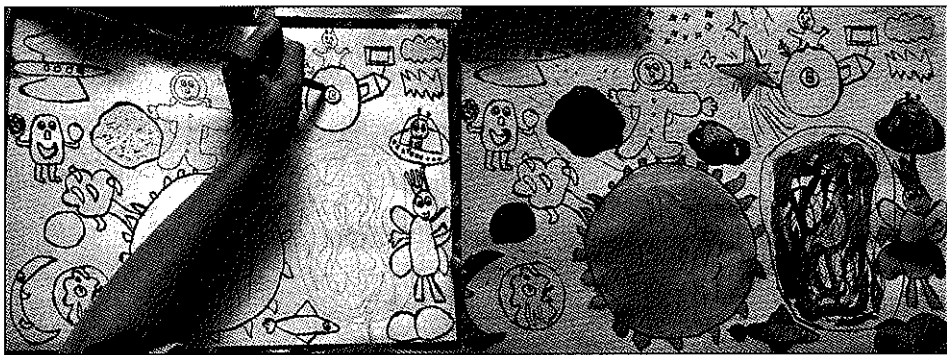
Picture 4: Initial drawing of Girl A on the theme wonders of the universe and her continuation

In the picture we can see operating procedure, as well as art and design strategy of Girl A. The pupil started to draw from right to left. She did the same thing with the colouring where she just painted the elements first and started on the background last. She was using every available colour. The main figure of an alien was painted in warm ochre colour and she used a similar, but slightly more diluted colour for the planet on the utmost left corner as well as for craters on the right side of the planet. The right side of the sun and upper part of the Saturn like planet were filled with diluted yellow ink. The alien on the right, and the flying

saucer above him as well as a bigger figure on the left side were painted in green-blue shades. Prevailing colour of the background is purple with unpainted white surfaces. The pupil thus created an interesting warm cool contrast and achieved a suitable level of art expression suggestibility.

3.7. The process of making a drawing using coloured ink of Girl B

Girl B also chose A3 size paper and turned it horizontally. At the bottom, slightly to the left, she drew a large globe that represents the sun, and then she filled the drawing with planets, animals, spacecrafts, and unusual creatures. The elements on her drawing float in the air and are distributed throughout the paper. Drawing made with a pencil is full of details and compositionally balanced. In the picture (picture 5) we can see the process of work by Girl B using coloured ink. She coloured the largest round form that represents the sun in yellow orange colour first. She diluted ink with water and used thinner on some and denser colour on other areas to get different orange-yellow shades. She used the same colour to paint the larger star above the sun, and a group of stars left from the centre figure. With a dense blue colour the pupil painted a smaller comet beside the alien and with slightly diluted blue ink she filled the sky in the upper left corner.

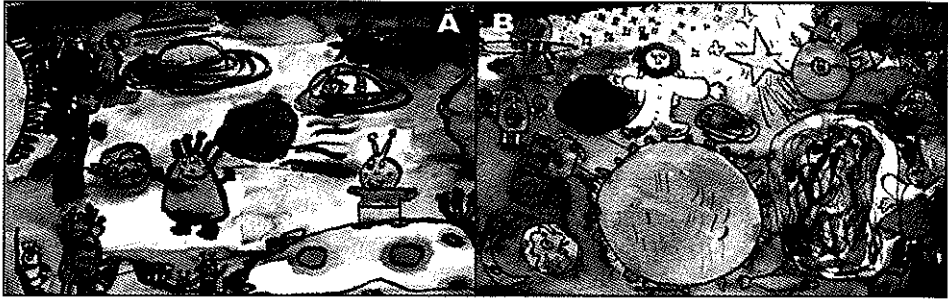


Picture 5: *Initial drawing of Girl B on the theme wonders of the universe and her continuation*

She used quite diluted blue ink for the aliens, planets, and flying objects on the left and right corner of the drawing. She used purple colour to fill a small, Saturn like element in the centre of the paper, a flying alien on the right side, and upper right corner above the nice house on the small planet. For the background the girl mixed warm and cool colours, thus creating very interesting colour effects that are also seen in the picture. The centre figure of the alien, the right outer side of the large planet in the right lower corner, as well as some smaller surfaces in the background were left unpainted.

3.8. The comparison of the finished artworks of Girls A and B

In the picture (picture 6) we can see finished projects of both girls, Girls A and B. If we compare them, we can see that both coloured drawings are very picturesque, but they differ more than the works painted in tempera paints.



Picture 6: *Finished artworks of Girls A and B on the theme wonders of the universe*

The girls were applying coloured ink in a very relaxed manner. They were diluting and mixing the colours well, thus creating numerous interesting effects that give us the feeling of a special atmosphere in the universe. Their significant way of work is shown as a crowded and chaotic composition, which is especially conspicuous at Girl B. Girl A left certain surfaces unpainted so her artwork gives a feeling of freshness. She also showed a good feeling for colour coordination and colour distribution. Girl B filled her drawing with colours, painting almost all background, leaving white only the astronaut at the top of the yellow globe. Both pupils put a lot of imagination and boisterousness in their artwork.

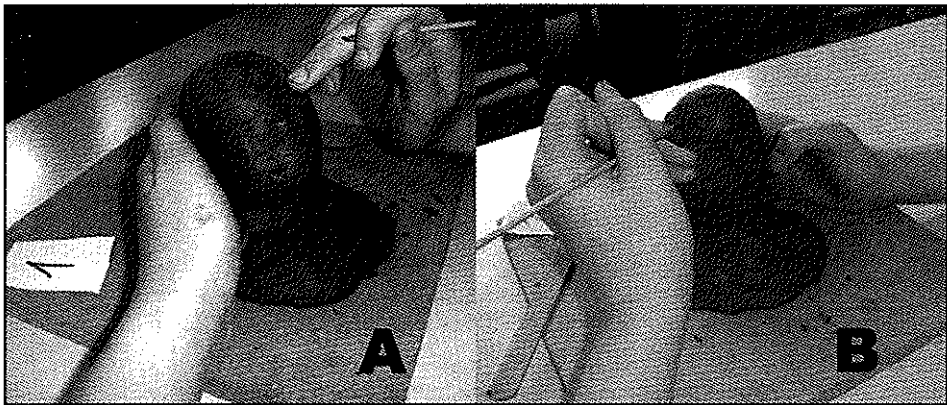
3.9. The third art task: Clay self-portrait

The third art task was from the art field of sculpting. The assignment in this lesson was designing a self-portrait from natural materials. The pupils used clay to make a self-portrait. This didactic unit also lasted two 45-minutes periods. We presented the sculpting material, and the sculpting methods, and we also pointed out frequent mistakes made when making a clay sculpture. They had to be aware of the facial proportions and also had to be careful that the sculpture stands. To be easily recognised, the pupils were given numbers. The pupils in question had the numbers 1 and 2.

3. 10. The process of making clay self-portrait

In the picture we can see how Girl A started to make her self-portrait. She made the head, lower part of the shoulders, and the neck. She pushed the breasts forward

and the head back. From the round clay mass she pulled out a small nose and she hollowed eye sockets. She added eyelashes to the eyes with a stick and made dots, pupils in the middle. Then she used hand pressure to make a mouth and round cheeks on both sides of the face. After that she modelled the hair. She attached pieces of clay to the head using both hands. The hair gives an illusion of a ring at the top of the forehead and falls flat on the back. The pupil had some difficulties with the mouth as she had to correct it several times. At the end she used a stick and made a heart shaped form. She did not rub out the surface; she left a rough surface with visible imprints of her hands. At the end she hollowed her self-portrait so that the clay could dry and not crack during baking in the furnace. The pupil then used her fingers to repair the sculpture as it was slightly deformed after she made the hole.



Picture 7: *The process of making clay self-portraits by Girl A and Girl B*

Girl B started making her self-portrait in a similar way as her twin sister. She modelled the head, especially the face, the neck, and the shoulders. She widened the shoulders and breasts into a base and she pushed the head slightly back. In the picture (picture 7B) there is clearly seen an elongated nose that she pulled out the clay mass. She modelled it with a modelling stick and added nostrils. She used a stick to make the mouth and indicated it with an upward line. She used a similar technique to make the eyebrows. In the picture (picture 7B) we can clearly see the almond shaped eyes with deeply embedded pupils, and eyelashes that she all made with a stick. Later on she used a modelling stick to widen the mouth in a big smile. She started adding hair by attaching small pieces of clay around the head and flattening them with her fingers. Girl B used a modelling stick in her work. The way she modelled the hair is very interesting because she attached it on each side in two strands that widen at the bottom and embrace the shoulders. She left a gap on each side of the head that makes the sculpture even more diverse. She indicated the garment with three dots that represent the buttons.

3.11. Comparison of the finished clay self-portraits of Girls A and B

Sculptures of the two girls are quite different. Self-portraits of the girls are visually not very similar, but they are quite similar on the surface that is left coarse and rough with imprints of the tools and hands. The procedure is also similar as they both modelled the head first, then the base, the face, and lastly the hair. We can establish that the twin sisters had an identical art and design strategy, but each used her individual technique to resolve the art task. In the picture (picture 8) we can see that both sculptures are quite diverse and interesting. Girl A slightly lifted up the head in her self-portrait and Girl B made an interesting shape with the hair.



Picture 8: Finished sculpture works of Girl A and Girl B on the self-portrait theme

We can see quite similar starting point and basic layout in the finished self-portraits of girls, twin sisters, but quite different finished image. The differences are shown in the modelling of the eyes, the nose, the hair, the cheeks, as well as the breasts of the sculpture. The similarities can be seen in the way they handled the surface, which is quite spontaneous in both cases; the markings of fingers and tools (modelling sticks) are visible, there are practically no rubbed out surfaces. Both girls hollowed their sculpture, thus preparing it for the drying and backing in the furnace.

4. Conclusion

The purpose of this research was to discover the artistic expression of identical twins; what are the similarities and the differences, what are their art and design strategies at drawing, painting and sculpting. In contrary with one of the previous researches, where we studied art and design strategies of children (Duh & Herzog & Gosak, 2011) we established that art and design strategies and the artistic expression of identical twins is quite similar, especially at drawing and painting. At sculpting, the final artworks of the girls have more visual differences, but they used similar art and design strategies.

It is interesting that girls always chose the same format. At surface design art tasks (drawing and painting), both of the twin sisters chose the standard A3 format among the four different formats available. The position of the format was also the same, as they both turned their piece of paper horizontally at both tasks. The girls chose the format individually, not together.

The artistic expression of both girls is relaxed, which was shown at time of creating, as they finished their work first in class. During painting, they relied on the drawing, which they sketched earlier, but did not follow it completely. They changed many things, added new ones and even left some out. Their artworks were colourful and interesting and they used a varied palette of colours and shades.

Their significant way of work is shown as a crowded and chaotic composition, which is especially conspicuous at Girl B. The drawing, they sketched for the first and second task, has shown quite a lot of similarities between the girls. They both depicted animals, plants and objects and filled every spot of the format with it. At sculpting, both girls used a similar manner of creating a self-portrait. Firstly, they shaped the head and the base and added elements, such as eyes, nose, mouth, ears, and hair in a similar sequence. They left the surface of the sculpture coarse and rough.

In our research, we focused on the artistic expression of identical twins. We could compare the twin population with singletons of the same age and establish the differences and similarities between them. The results of the study we carried out on singletons, where we observed art and design strategies of children between the ages on 10 and 11, show that art and design strategies were changing when they were using traditional drawing techniques (felt-tip pen and charcoal) as well as when they were using drawing tools in the computer program Paint. Obviously, there were greater differences at drawing with the computer in comparison with the other drawing techniques – felt-tip pen and charcoal (Duh et al., 2011). It was established in the study of the art and design strategies of preschool children (Duh, 2009) that despite the same starting point, there were signs of individual characters of children in their artistic expression.

It would be interesting to continue observing the pair of identical twins and study the similarities and differences in their artistic expression at various art techniques and materials. We would discover how identical twins respond to offered techniques and materials; whether they respond similarly to artistic problems and choose similar solutions. This research could be an introduction to an extensive study, where we would research the three populations of twins: the population of identical twins, fraternal twins of the same sex and fraternal twins of the opposite sexes. We would compare acquired results within individual pairs as well as within different population of twins. Thus we would establish the differences and similarities in the artistic expression of twins on a larger sample, which is necessary for generalizing the acquired results.

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Le strategie nella formazione artistica dei gemelli monozigoti

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Riassunto: *La ricerca qui rappresentata riguarda le strategie nella formazione artistica dei gemelli monozigoti nei vari settori dell'arte: disegno, pittura, scultura. Nella ricerca ci siamo sderviti di un case study. Il campione è dunque rappresentato da una coppia di gemelli monozigoti, nella fattispecie due ragazze di dodici anni, iscritte alle scuole elementari. I dati, che abbiamo raccolto osservando le due alunne durante la creazione artistica sono stati analizzati ai fini dello studio e della valutazione delle creazioni e del lavoro artistico delle gemelle monozigote.*

Abbiamo, infine, concluso che l'espressione artistica dei gemelli monozigoti nella pittura e nel disegno è molto somigliante. Nella scultura i lavori differiscono nella forma anche se le ragazze hanno seguito le medesime strategie artistiche.

Parole chiave: *gemelli monozigoti, educazione artistica, strategie formative, scuola elementare, creazione artistica.*

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