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Elementary Design: A form of Creative Thinking Implementation to Develop Student Creativity

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

In the field of visual communication design, creativity becomes fundamental for every visual communication designer to have. So in practice, visual communication designers need a process of thinking and acting in harmony with producing their creativity. One of the materials is through learning Elementary Design in college. This course is presented to trigger the students in the creative thinking process through processing and organizing visual elements. Thus this research was conducted to descriptively review Elementary Design as a form of implementation of creative thinking and efforts to develop the creativity of visual communication design students, especially for 1st-semester students of the Graphic Design & New Media Program, Bina Nusantara University. The method used in this research is an educational research & development model approach. These stages include (1) Identifying the potential issues and problems; (2) Collecting data; (3) Product design; (4) Design validation; (5) Design revision. The results revealed that the research & development method with the

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creative thinking process approach encourages students to find associations of forms from intangible to tangible.

Keywords: Elementary design; students; research & development; creative thinking; education.

1. INTRODUCTION

Visual communication design is a professional work in Indonesia known as graphic design. The term graphic design is used to articulate the definition of graphein means a line or marking. This definition is used in Indonesia to define works in graphics related to printing techniques limited to two-dimensional and static forms. Since the Industrial Revolution in the 19th century, graphic design works began to support economic activities. This development is in step with information technology and impacted the emergence of new media that changed the graphics design paradigm. From two-dimensional (printed media) to digital. The changed of graphic design to visual communication design terms, which is a professional field engaged in the area of designing visual communication solutions through identity, information, and persuasion content as the goals of the task provider to the target audience or consumer using conventional (print-based) and unconventional (non-print-based) media. [1].

The development of the visual communication design work area further expands the role of the visual communication design and its intersection with the economic field. Especially in the dynamics of the industrialization trend that continues to increase [2]. This trend presents a variety of products and services in the market. Each company competes with the others to get the consumer's attention. Promotional activities are the main function to attracted consumers attention. Therefore the need of visual communication designer profession is increase to supported the diverse needs of visual communication in promotional media [3]. This is following the role of visual communication design to provide a variety information through visual communication media as a problem solutions [4].

The need for visual communication designers was then implemented in the form of visual communication design majors established by educational institutions in Indonesia. The number of enthusiasts also continues to experience an increasing trend every year. There are a variety of reasons why the field of design is so in demand [5]. In the realm of education, the courses offered by this educational institution are very diverse. Various courses that study visuals, colors, composition, photography, animation, and others are the main capital for visual communication design students to enter the industrial world as a professional [6].

The complexity of this material studied then forms a common perception that places a visual communication designer as a creative and innovative individual. This is because the main work of visual communication designers is to work on changing graphic materials that can communicate effectively and aesthetically. In addition, it has been generally understood that design work is an individual activity in creating that uses each of the relevant verbal and logical analyses [7]. So creativity is the main point that a visual communication designer needs to have professionally. Creativity is the ability that a person has to discover and create something new, in a new way, a new model, and useful for himself and others [8]. Creativity cannot be measured based on I.Q measurements. Creativity is related to personality, creative personality becomes a characteristic of creative individuals. Creative motives manifest in creative activities such as finding, designing, composing, planning, etc. Individuals are called creative when they have behaviors that are included in these activities [9].

Not a few measurement methods are carried out through a series of tests to measure the level of creativity. Hocevar identified that 4 types of creativity tests can be done, namely: divergent thinking tests, attitude and interest inventories, personality inventories, and biographical inventories. However, from a series of tests, it was found that the test carried out cannot be used as a synonym for creativity [10]. In addition to the test, a review of research related to creativity was also found based on previous research. Previous research found that creativity can be developed. Mustafa Senel and Birsen Bagceci conducted research related to the development of creative thinking skills that can be done through journaling. The study involved students who were given 23 journal writing topics within two months. The results of this study revealed that creative thinking with writing

activities has a positive effect on the development of students' creative thinking abilities [11].

Other research related to the development of creativity was carried out by Asni Harianti and Yolla Margaretha. This research uses the brainstorming method to develop student creativity in entrepreneurship courses. The results of this study found that there was a significant increase in student creativity after getting brainstorming treatment. However, there was no difference in the development of creativity between students in the group who were given brainstorming treatment and the group that was not given treatment [12]. Research on the relationship between creative and critical thinking in solving a problem has been carried out previously by Anita Ismail, et al in 2020. In the study, it was revealed that creativity is the ability to generate new ideas and solutions to a problem. So creativity needs to be trained and developed with a variety of techniques and approaches [13].

From these studies, it knows that creativity can be developed, especially creativity can be developed for visual communication design students. It can be done to develop the creativity of visual communication design students through the development of student soft skills by applying the creative thinking process. The application of the creative thinking process is obtained by studying basic courses, namely Elementary Design. Thus this research was conducted to review the role of one of the basic courses, namely Elementary Design in developing student creativity to process a variety of graphic materials. Especially for 1st-semester students in the Graphic Design & New Media Program, Visual Communication Design Department, Bina Nusantara University.

Research on the implementation of creative thinking processes in Elementary Design lectures is still very rarely carried out. This is proven through a research gap search using the help of the Open Knowledge Maps application with the keyword "elementary design education and creativity". From the search results it was found 1 large cluster was "creativity of elementary, and creativity, elementary students" (Fig. 1).

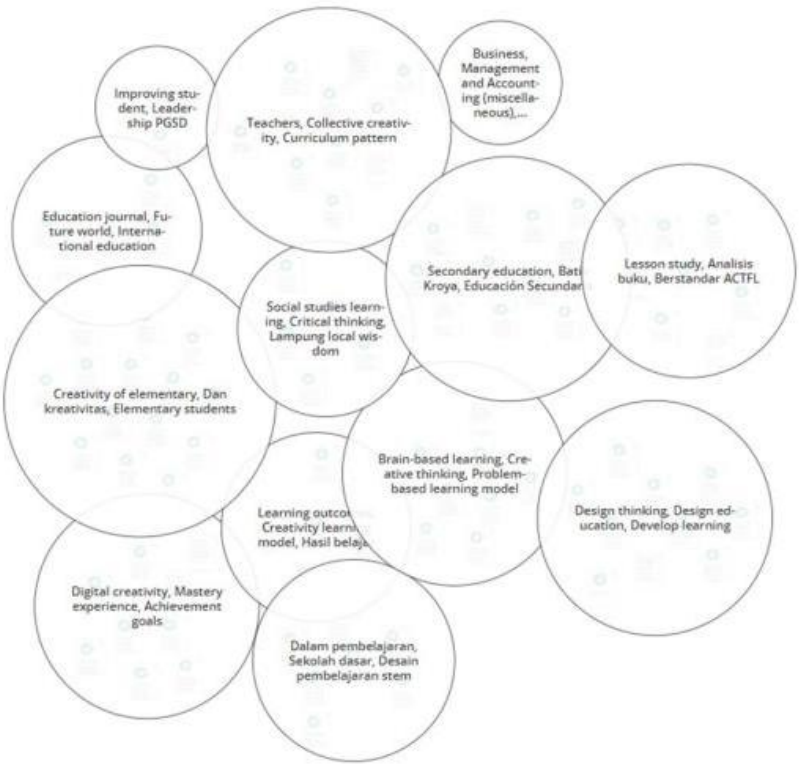


Fig. 1. Elementary design and creativity clusters based on Open Knowledge Maps analysis results

2. METHODS

This research uses the Research & Development method, a research method that deliberately and systematically aims to find, formulate, improve, develop, produce and test the effectiveness of a product or model. Furthermore, this research as research and development model in the field of education and learning as a process used to develop and validate educational products. There are 10 steps to be taken in research and development including: (1) Research and information collection; (2) Planning; (3) Initial product development; (4) Limited initial trials; (5) Trial revisions; (6) Main field trials; (7) Operational revisions; (8) Operational field tests; (9) Revision of the final product; (10) Dissemination and implementation [14]. This research is an initial stage research so the stages carried out are limited to: (1) research and information collection; (2) planning; (3) initial product development; (4) limited initial trials; and (5) trial revisions.

At the data collection stage, what is done is to conduct a literature review of previous research. This is done through a survey of the curriculum, student conditions, lecturer conditions, learning processes, and learning support facilities. At the planning stage, what is done is to plan learning outcomes along with the procedures that need to be done. At the initial development stage, the thing to do is to draft a learning model. The learning model carried out is to take a creative thinking process approach. This approach was chosen because the procedures in it already have processes and procedures in problem finding, ideation, and evaluation stages. Where this process is also used in the limited initial trials stage as well as the revisions trial stage.

The initial development stage is carried out in the classroom using a creative thinking process approach. The creative thinking process has two stages where the first stage is the problem finding, ideation, and evaluation stages. While the second stage is the stage carried out to sharpen the findings in the first stage through knowledge and motivation. In problem finding, students identify and define problems. This stage is supported by the knowledge provided by lecturers in class. After completing the problem finding, students begin the ideation stage. At this stage, students began to explore and solve the problems supported by the knowledge and motivation provided by the lecturer. After the ideation is completed, the next step is to do an evaluation. Evaluation is carried out with the guidance of lecturers supported by the motivation that builds students' interest in continuing to carry out the creative thinking process in their designing activities.

This creative thinking process is carried out by 1st-semester students in the Elementary Design course in the Graphic Design & New Media Program, Visual Communication Design Department, Bina Nusantara University. The application of the creative thinking process carried out by students is expected to be able to find new associations of point and line elements that have similarities with objects or materials that are familiar to students

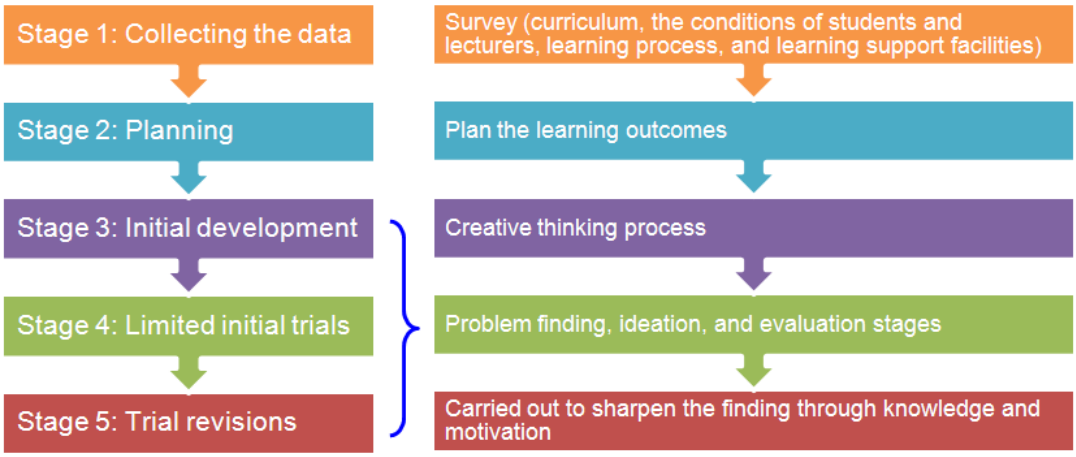


Fig. 2. Research process

3. RESULTS AND DISCUSSION

3.1 Findings

The work of visual communication designers is related to creativity. The word creativity is often understood as a skill based on a person's innate or natural talents [15]. This is in line with what Layman expressed in Cox (1926) that creativity is a gift to individuals with certain qualities that ordinary people do not have [9]. But actually, every individual has the potential to be someone creative. Erich Fromm defines creativity as the ability to see (be aware and be sensitive) and respond, so from this perspective creativity is closely related to productivity [16]. Productivity according to Fromm is the productivity of expression which he calls the life force provided by nature and produces artistic qualities [17]. Amabile also revealed that there are various phenomenological explanations related to creativity, especially individual creativity which is obtained because it is influenced by environmental factors [18].

Meanwhile, according to George D. Stoddard, it is revealed that being creative cannot be guessed or foreseen in advance. Creativity must be seen from aspects of a person's daily life that appear from actions directly, not just calculations, estimates, or scenarios outlined by a certain group of thinkers. This is because creativity is not limited to the realm of thought or the realm of ideas alone. Creativity is a dynamic that brings about meaningful change, whether in the world of the material, the world of ideas, the world of art, or the social structure [19]. So, the definition of creativity can include the reality of human energy and spontaneity. Because in essence humans are not machines nor computer programs. Improvisation is included in the extensive map of human creativity [20].

According to the "*Kamus Besar Bahasa Indonesia*" (KBBI) or Indonesian Language Dictionary, improvisation is the manufacture of something based on rough materials. While the notion of improvisation in the realm of art refers to the creation or performance of something without prior preparation. Improvisation itself according to Merriam Webster has the meaning of composing, reciting, playing, or singing extemporaneously. Other recommended definitions are to make, invent, or arrange offhand and to make or fabricate out of what is conveniently on hand. Based on the understanding, improvisation included in the map of human creativity is an activity carried out to find, create, or play something. So from this understanding visual communication designers who are actors in improvised activities, often use spontaneity in their design activities which are included in the map of human thinking creativity. Visual communication designers are required to be creative in the midst of the times. Especially with the development of a variety of media that can be used as a visual communication medium today [21]. Thus in the realm of visual communication design education, student creativity is triggered through learning materials. One of the learning materials courses is Elementary Design.

Elementary Design is one of the basic courses in visual communication design that studies the organization of elements and the principles of layout. The elementary design itself was previously known as "*Nirmana*". The term "*Nirmana*" comes from the old Javanese word "*Kuna*" (Kawi) which means "without wishful thinking". So "Nirmana" is a process of work through the preparation of elements of fine art and design as well as the application of the principles of art and design to obtain the artworks of fine art and design that have the value of beauty. "Nirmana" can also be understood as something "without form" or "without form". The point of this understanding is that to obtain beauty without intending to manifest it into a certain form of an object can be done through the observance of the appearance system ("*Nirmana*") [22].

Elements of art and design that are the basic material for designing include points, lines, shapes, textures, colours, spaces, and others. Meanwhile, the principles in arranging the appearance include rhythm, unity, dominance, balance, proportion, simplicity, and others [3]. All elements of art and design can be processed, organized, and explored in such a way that they become a certain aesthetic form. This element of processing, organizing, and exploration then triggers the creative mindset of students. The creative mindset can be done in various ways, one of the approaches is the "creative thinking" process. Creative thinking is an effort to form an association of elements so that new combinations are produced by the provisions and function [23].

The efforts to form an elemental association and then produce a new combination can be done through seeing and discovering. The process of seeing various materials in the surrounding environment triggers individuals to reinterpret the material they have seen. The reinterpretation triggers the emergence of ideation which then produces new combinations so that they can be categorized as an effort to find [24]. In associative terms, there are three ways to cultivate creativity. This also involves an ideation process that arises from the aspect of material association. The three ways include serendipity, similarity, and mediation. In the way of serendipity, associative elements can be found empirically to the material present in the surrounding environment (usually this appears involuntary) which stimulates to associate of the element. In the way of similarity, associative elements are found based on the similarity of associative elements or similarities to certain materials to stimulate the emergence of associations. Whereas in the way of mediation, associative elements are found based on the mediation of common elements [23].

Meanwhile, the basic components of creative thinking consist of two stages. The first stage includes reflecting problem finding processes (problem finding), ideational processes (ideation), and judgmental processes (evaluation). The second stage includes knowledge and motivation. The second stage contribution is to compare or as a controlling factor. This is because the results in the second stage are very dependent on the first stage. The first stage represents a set of abilities possessed by humans. Problem findings are how a person identifies problems, defines problems, etc. Ideation is the ability to produce fluency, originality, and flexibility in a person to find solutions. Evaluation is the stage of critically evaluating the results of ideation [25] (Fig. 3).

Previously, research related to the creative thinking approach as carried out by Sari found that the creative thinking approach was able to encourage students to develop the skills that exist in students. Meanwhile, the function of the lecturer changed to become a facilitator [26]. In other studies, the application of creativity learning can improve creative thinking skills and responsibility for students [27]. Based on the predecessor's research, this research was conducted using research & development methods and the application of a creative thinking process approach.

3.2 Discussion

This 1st-semester student is required to take the Elementary Design course. Some of the materials are organizing and exploring design elements such as points and lines. Thus producing a design that was originally intangible into an aesthetic organization. The ultimate goal of this course is to have a sensitivity in processing, organizing, and exploring various design elements. This lecture method is dominated by the practice carried out by students. Consideration of practical methods is based on training students' taste and technical abilities to be "accustomed". Moreover, the students are in the first semester, and they are still "acquainted" with the field of visual communication design. In addition, the competence of visual communication designers is a practical competence, so the learning approach with practical methods is applied in the Elementary Design lecture system in the Graphic Design & New Media Program study program, Visual Communication Design Department, Bina Nusantara University.

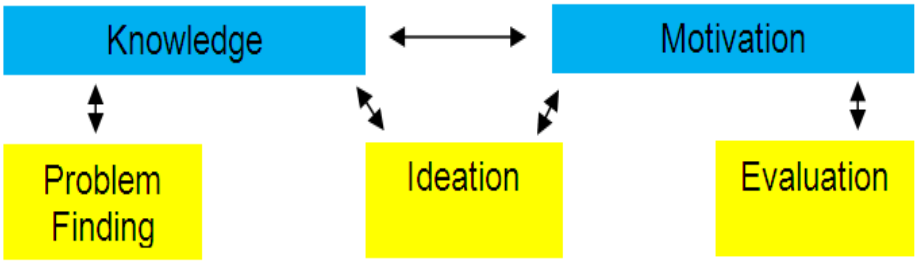


Fig. 3. Two-tier model of creative thinking

One of the assignments given in the Elementary Design course is to explore using point and line elements. Points and lines are one of the design elements used in the entire field of design work. Together, points and lines will produce shapes or look in a layout. Although points and lines are simple materials or objects that are not representative, if the points and lines explored and organized in a layout, it will produce an aesthetic design work. Any form that exists in this nature can be simplified into a shape with a geometric and organic expressions. The expressions is a characteristic of a form. Geometry is a mathematically created regular expressions covering the shape of a triangle, quadrilateral, pentagonal, hexagonal, etc. And an organic expressions is a freely created field that is confined to a free curved line, a free-angled plane, and a combination of the two [22].

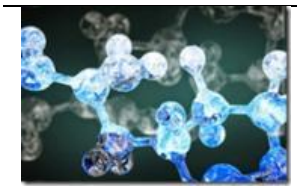
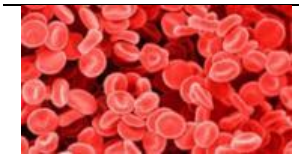
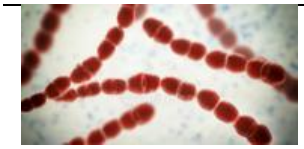
The ideation process of similarity carried out on the material of exploration of points and lines frees students to explore the elements of points and lines. Exploration is carried out with the consideration of the discovery of new visual forms with the expression of the organic field as well as geometry. The results of such exploration should be able to find new visual forms with an organically and geometrically expressions that has changed from the beginning (only points and lines). Meanwhile, as a facilitator in the classroom, lecturers apply "similarity" as part of the creative thinking process to students. The similarity is carried out by utilizing the similarity of material or visual objects recognized by students to be ideated so that they become new associations. Lecturers also apply two stages of the creative thinking process. The first stage consists of problem finding, ideation, and evaluation. The second stage is to consider knowledge and motivation in the first stage to be able to realize the association of similarity of the assignment given.

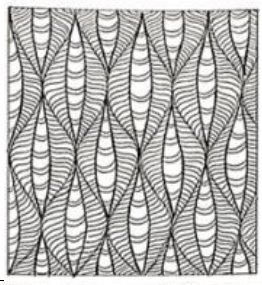
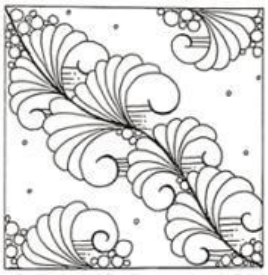
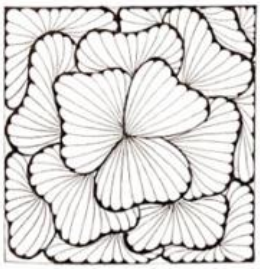
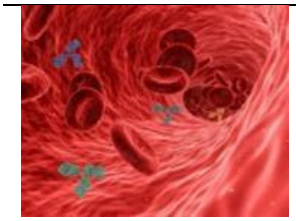
Previously, lecturers gave assignments that needed to be followed up by students through problem finding. In this section, students need to identify and define the problem at hand. The problem in this section is to produce new associations that are produced through exploration of points and lines, where the results of the new associations contain similarities with the materials in the environment around the student. In addition, this new association must also take advantage of organic and geometry expressions. To strengthen the problem-finding process, students' knowledge of the characteristics of points and lines is needed. In this section, the knowledge is facilitated by the lecturer with introductory theories related to points and lines. In addition, the lecturer also provided several references for this assignment. After the process of problem finding and strengthening knowledge is given to students, the next stage is the ideation stage.

At the ideation stage, students begin to explore various ideas that are relevant to the problem-finding stage. The thing to do is to start making various ideas that can be realized. In addition, students look for various material possibilities in the surrounding environment that can be the reference for the process of creating new associations. To strengthen the understanding of ideation, knowledge of similarity is needed. Lecturers facilitate student knowledge through various references to the creation of associations that have similarities with objects in the environment. In addition, students also independently look for various possible objects that can be used as ideas in the creation of this new association which of course has similarities with the objects in the surrounding environment. Meanwhile, knowledge at the ideation stage and motivation is also needed as a part of the creative thinking process. This motivation is stimulated by lecturers through various references. Motivation also encourages students to start creating new associations. In this section, students begin to practice creating new associations based on the results of problem finding and knowledge that have been obtained. The result of this ideation process was created with various considerations for the assignments given including similarity and organizational expressions and geometry that must be attached to new associations.

From this process, 21 works were found that corresponded to the assignment given. This conformity is based on the provisions of similarity as well as the organic and geometric expressions that must be attached to the work. Works that become a form of exploration of design elements in Elementary Design by applying the creative thinking process appear in the following works:

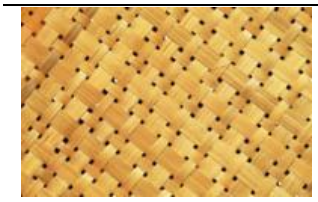
Table 1. Exploration of points and lines with organic expressions

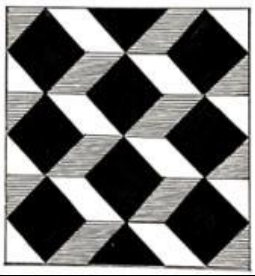
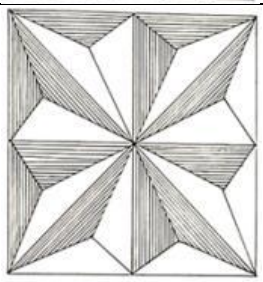
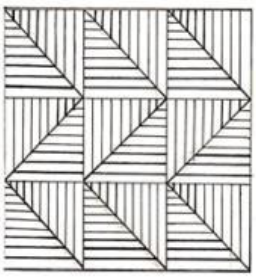
Similarity	Ideation Association	Creative Thinking Process
		Ideation is carried out by exploring points and lines organically which arise the new forms that are similar to parasitic forms that are in the human body.
		Ideation is carried out by exploring points and lines organically which arise the new forms that are similar to braids hair.
		Ideation is carried out by exploring points and lines organically which arise the new forms that are similar to the body of tapeworms.
		Ideation is carried out by exploring points and lines organically which arise the new forms that are similar to macromolecular form.
		Ideation is carried out by exploring points and lines organically which arise the new forms that are similar to red blood cells in the human body.
		Ideation is carried out by exploring points and lines organically which arise the new forms that are similar to Streptococcus thermophilus or bacteria present in industrial packaged foods.

Similarity	Ideation Association	Creative Thinking Process
		Ideation is carried out by exploring points and lines organically which arise the new forms that are similar to coconut husk and peas.
		Ideation is carried out by exploring points and lines organically which arise the new forms that are similar to Sansevieria leaves.
		Ideation is carried out by exploring points and lines organically which arise the new forms that are similar to Orchid flowers.
		Ideation is carried out by exploring points and lines organically which arise the new forms that are similar to a wave of curls.
		Ideation is carried out by exploring points and lines organically which arise the new forms that are similar to Carnation flowers.
		Ideation is carried out by exploring points and lines organically which arise the new forms that are similar to membranes in the human body.

Source: Mita Purbasari

Table 1. Exploration of points and lines with geometric expressions

Similarity	Ideation Association	Creative Thinking Process
		Ideation is carried out by exploring points and lines geometrically which arise the new forms that are similar to skyscrapers.
		Ideation is carried out by exploring points and lines geometrically which arise the new forms that are similar to carpet.
		Ideation is carried out by exploring points and lines geometrically which arise the new forms that are similar to windows on skyscrapers.
		Ideation is carried out by exploring points and lines geometrically which arise the new forms that are similar to swivel staircase.
		Ideation is carried out by exploring points and lines geometrically which arise the new forms that are similar to woven bamboo.

Similarity	Ideation Association	Creative Thinking Process
		Ideation is carried out by exploring points and lines geometrically which arise the new forms that are similar to plaid patterned cotton fabric.
		Ideation is carried out by exploring points and lines geometrically which arise the new forms that are similar to motifs on floor tiles.
		Ideation is carried out by exploring points and lines geometrically which arise the new forms that are similar to steel frame on the roof of the building.
		Ideation is carried out by exploring points and lines geometrically which arise the new forms that are similar to bamboo woven motifs.

Source: Mita Purbasari

After the entire work is successfully realized, the next stage is the evaluation stage. The evaluation stage is the stage where each work that has been created is reviewed and given an assessment or suggestions and input by the lecturer. From the 21 works collected, it was found that the works were by the provisions of the assignment given. Each work is created from a creative thinking process consisting of two stages that have been carried out previously. Each of the works has also considered the way of similarity between both organic and geometric expressions.

The similarity uses a variety of objects or materials that can be found by students in their daily lives. Either directly or indirectly. Some of these objects such as parts or organs in the human body, plants, rotary stairs, bamboo mats, buildings, etc. Exploration with points and lines has been carried out by students so that they have associations that have similarity with the objects which is familiar to students in their daily lives.

In addition to providing assessments at the evaluation stage, lecturers also motivate and stimulate students to continue to use this creative thinking process in every design process. This motivation is given so that students become visual communication designers who can think creatively in every aspect of their lives. Not only in the design process.

4. CONCLUSION

Becoming a visual communication designer who has the power of creativity cannot be done instantly. It takes a series of processes that must be carried out to train one's self-creativity. One of them is to train students to understanding the process of creative thinking. Where the creative thinking process consists of two stages, namely the first stage consists of problem finding, ideation, and evaluation. And the second stage is the stage presented to strengthen the knowledge gained in the first stage, namely knowledge and motivation. In the academic realm, this understanding can be done by processing the elements and design principles obtained in the basic Elementary Design course by 1st-semester students in the Graphic Design & New Media Program, Visual Communication Design Department, Bina Nusantara University. Students' assignments are given to train their creative thinking process. Some of the provisions in the assignment include the application of each stage to the creative thinking process and consideration of the similarity of the new associations created.

From the results of the assignment, the similarity method in the creative thinking process, it was found that students were able to find associations based on similarity in the ideation process. So through this process, students can create new works from the exploration of points and lines with the expression of the field of organic and geometry expressions. The results of the assignments carried out by students show new forms of associations that are similar to various objects that can be found in daily life either directly or indirectly. Some of these objects include human body parts, plants, buildings, etc. Students succession in creating similarity in the new association cannot separated from the students ability to apply the first stage of the creative thinking process, namely problem finding. Students need to identify and define existing problems based on the assignments given. In this case, finding problems is carried out by students with the help of lecturers. Lecturers provide a set of knowledge that is the basis for students to identify and define existing problems. Thus the first stage in the creative thinking process can be completed properly by students.

Similarly, at the ideation stage carried out by students. Students use the knowledge and motivation that has been given by the lecturer in the process of finding ideas carried out. So through this knowledge and motivation students can explore the elements of points and lines into a new association that has similarities with objects or materials that are familiar to be found in everyday life. From the results of this ideation, a joint evaluation was carried out between lecturers and students. In the evaluation stage, lecturers emphasize motivation for students to continue and consistently train their creative thinking process that has been carried out when designing. This is done by the lecturer to encourage students to continue train and developing their creativity. This is regarding that the creative thinking process is not only result-oriented but also process-oriented. Although organizing design elements and principles seems like a simple thing, if done consistently, the creative thinking process through exploration of these design elements and principles can train the sensitivity of visual communication design students in processing and organizing design elements and principles to produce aesthetic design work. The next impact is this sensitivity as well as a form of creativity that exists in a visual communication designer.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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