

# The Development of Students' Creativity in the Making of Scrapbook Media in Learning the Properties of Colloids

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**Keyword:** Creativity, Media Learning, Colloid.

**Abstract:** This study is conducted to analyze students' creativity in the making of scrapbook media in learning the properties of colloids. The method used is a classroom research with one-shot case study design. Data is obtained by measuring students' creativity in the making of scrapbook media as the learning product. The measurement is based on the indicators of creativity or the four P's Creativity, namely person, process, press and product. The results show that students had creativity included in the good category with the average score of 83. This is because scrapbook media is an art of sticking pictures or photos containing related important notes on paper media decorated into a creative work.

## 1 INTRODUCTION

Chemistry learning is full of simple to complex concepts and concrete to abstract concepts (Burhanudin, et al., 2018), so that a right understanding of the basic concepts of chemistry is required. Colloid is one of the abstract concepts with concrete examples (Kamisah, 2007), mainly discussing about theories. In learning colloid, the concept of colloid has several objectives that will be difficult to achieve if only relying on the teacher's explanation. Therefore, in order to achieve optimal learning outcomes, it is necessary to use media. The media can make the learning process more interesting, making learning objectives easily achieved because the material taught by the teacher will be clearer and easier to understand by students (Abass, et al., 2014). One of the alternative media that can be used by students is scrapbook. Scrapbook aims at attracting students' attention in the learning process and facilitating students in understanding the concept of colloidal properties. Scrapbook is also a book with moving parts or three-dimensional elements (Arsyad, et al., 2011). Scrapbook gives other benefits, namely it can make students more creative, and can channel students' interest (Klein, 2009). The final product of this research is made by students during the learning process to measure their

creativity related to the concept of colloidal properties.

Creativity can be defined as a cognitive activity that generates a new view of the form of problems (Solso & Maclin, 2008). Being creative is being able to produce various alternatives and creative processes supported by the environment, and to create something imaginative (Çiğdem, 2015). A research about the use of scrapbook has previously done by Maita. Based on Maita's research results, scrapbook is more effective to be used as learning media because it can improve learning outcomes in the learning of the diversity of traditional houses in Indonesia (Maita, 2017). However, there is no research about the use of scrapbook in chemistry subjects, especially in the colloidal system material. For this reason, it is necessary to develop students' creativity in learning using scrapbook media. Based on the description, in this paper will be reported an analysis of the development of students' creativity in learning colloidal properties.

## 2 METHODS

The method used is a classroom research with one-shot case study. This study uses a project-based learning model consisting of 6 stages, namely stage I to identify problems, stage II to design and schedule

project implementation, stage III to carry out the research, stage IV to draft a product, stage V to measure, assess, and improve the product, and stage VI to finalize and publish the product. The assessment of students' creativity is carried out during the learning process. The measurement of students' creativity is based on the indicators of creativity or the Four P's Creativity, namely person, press, process and product (Munandar, 2009). The person indicator is measured in stages I and II during the project-based learning; the press indicator is measured in stage III; the process indicator is measured in stage IV and the product indicator is measured in stages V and VI during the learning process. At the end of the learning process, the final product produced by students is in the form of scrapbook. The subjects of this study include 22 students of class XI MIA from a private school in Cileunyi, Bandung district, in the second semester of the 2017/2018 school year.

### 3 RESULTS AND DISCUSSION

The product developed in this study is in the form of hardware, namely scrapbook. Scrapbook can be defined as an art of sticking images or photos on paper media decorated into a creative work. Scrapbook can also contain important notes relating to the images/photos (Maita, 2017). The results of the product assessment are presented in Table 1. The product assessment is done during the learning process. The assessment indicators are all based on indicators of creativity. There are four indicators of creativity known as the Four P's Creativity or 4P (Munandar, 2009), namely: Person, the uniqueness of individuals to think and express their thoughts; Process, the smoothness, flexibility, and originality in thinking; Press, a state of the environment that gives encouragement to perform creative actions; and Product, the ability to produce new, original and meaningful works for individuals and the environment. Therefore, creativity is not only about producing the product or result, but also about motivating a creative person to be involved in the process of creative thinking so as to produce creative products. During the learning process, students are divided into 3 groups so that there are 3 scrapbooks produced. One of the products resulted can be seen in Figure 1.



Figure 1. Scrapbook

Figure 1 shows one of the scrapbooks made by students, namely by group 1. This product has attractive and good designs but contains some materials unsuitable for colloidal properties. To decorate their scrapbook, this group uses materials available around them, namely cotton, leaves, and leftover food coloring used for making ice cream.

Based on table 1, according to the first indicator of creativity, namely person (creative person), the highest average score is obtained by group 3 i.e. 100 included in the very good category while the lowest score is obtained by group 2 i.e. 50 included in the poor category. This indicator of creativity has a description of confidence and diligence in working on the product. Group 2 obtains the lowest score because they are not diligent and not serious in working on the product. Group 2 consists of 8 students, but only 3 work on the product while the other 5 students do not for several reasons. Group 3 obtain a score of 100 because all of the group members work on the product confidently and diligently. Confidence and diligence are the characteristics of creativity indicating strong imagination, initiative, strong interest, freedom of thoughts, desire to get new experiences, confidence and courage to take risks (Ratih, 2013).

Table 1. Scores for the product of each group based on the indicators of creativity

Indicators of Creativity	Description	The Score of The Group			The Average Score
		1	2	3	
Person (a creative person)	Confidence and diligence in working on the product	83	50	100	77
Process	The ability of students to compile the product draft well with clear and solid materials	100	50	100	83
Press	The ability of students to make scrapbook with their own techniques	100	67	100	89
Product	Material suitability, students' skill in decorating the product and readable writing	87	60	100	82
The average score		93	57	100	83

The second indicator of creativity is process. The highest score is obtained by group 1 and group 3, i.e. 100 included in the good category. Group 2 gets the lowest score, i.e. 50 included in the poor category. This indicator of creativity has a description of the ability of students to compile a product draft well with clear and solid materials. Group 1 and group 3 compile the product draft very well. Related to this process indicator, Wallas (Wallas, 1970) argues that

creativity will emerge if someone has a personal factor and driving force for creativity in the creative process. At this stage, someone will seek and find an inspiration, then understand and bring new ideas.

The third indicator of creativity is press. The highest score is obtained by group 1 and group 3, i.e. 100 included in the very good category. The lowest score is obtained by group 2 i.e. 67 included in the fair category. This indicator of creativity has a description of students' ability to make scrapbook with their own techniques. Group 1 makes a scrapbook using materials available around them, group 3 makes a scrapbook by making caricatures of several group members and drawing some decorative figures in the scrapbook. This press indicator or the driving creativity aspect according to Csikszentmihalyi (Csikszentmihalyi, 1996) can be done through programmed and conditioned activities. This driving factor is the one will foster a person's interest and motivation to be involved in the creative process.

The last indicator of creativity is product. The highest score is obtained by group 3 i.e. 100 included in the very good category. Group 2 obtains the lowest score, i.e. 60 included in the fair category. This creativity indicator has a description of the suitability of the material, the students' skills in decorating the scrapbook and the readable writing in the scrapbook. The scrapbook made by group 1 contains unsuitable materials about 'types of colloids and their properties'. Group 1 writes several characteristics, namely adsorption, physical, optical, kinetic, conjugation and protective properties, which are very unsuitable for the colloidal properties in question, namely protective colloids. Meanwhile, the scrapbook made by group 3 contains unsuitable questions. The scrapbook made by group 2 does not contain the colloidal properties in question, namely the Tyndall effect. The scrapbook only contains differences in colloids, suspensions, and solutions, and tools, materials and procedures of the experiment.

#### 4 CONCLUSION

Based on the research results, data analysis and discussion, it can be concluded that students' creativity in the making of scrapbook media on the properties of colloids obtains the average score of 83 and is included in the good category.

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