



# adelila the impact of chemopoly

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## The Impacts of Chemopoly-Edutainment to Learning Activities and Responses

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### <sup>1</sup> ABSTRACT

The purpose of this study was to alleviate the problem of student learning activities through the use of innovative chemistry learning media, namely chemopoly-edutainment. This type of research was a pre-experimental study. The approach used was descriptive qualitative approach. This research has been done in Medan State University in 2017 year. The selection of research subjects was done by purposive sampling, i.e., Chemistry Department students as many as 36 people. Data were collected using observation sheet to measure learning activities. Then, students' responses were measured using a questionnaire. The results showed that learning about chemicals separation by using chemopoly-edutainment media could help students to be more active in learning. The activeness of students in the highly active category was found at 77.16 percent. While active students learn was reached 20.68 percent. In addition, found as many as 2.16 percent of students who were quite active. The study also found that none of the students were less active or inactive in teaching and learning activities using the chemopoly-edutainment medium. The students' responses to the use of chemopoly-edutainment media on chemical separation learning was also found to be positive.

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## 1. INTRODUCTION

After the curriculum changed into the curriculum of the Indonesian National Qualification Framework (KKNI), then the Analytical Chemistry II course was renamed to the Chemical Separation. This course studies the separation, identification, and quantification of chemical components in natural and artificial materials. However, in reality, some students were still lack understood of the distribution of several courses offered for each semester. Data on student learning outcomes in some courses was generally look not maximal, especially for analytical chemistry courses. The value was not only valid for one academic year only but for previous academic years. So it also was affected to the low learning outcomes of chemistry.

The same problem was also stated by Viani, et. al. [1] that the low learning outcomes of the students was because in the learning process of teacher and student interaction only goes one way. Teachers often use lecture methods so that students tend to only accept what was given. This can make the students' motivation and activeness in following the lesson to be low. In addition, Ananda et. al. [2] was found that there were many teachers still using lecture methods while teaching. It caused students to become passive and less interaction between students with teachers, as well as between students and students at in class. Students were only listened to the material presented by the teacher, but there were not efforts from students to try to understand the material. In relation to the above, it is necessary to make an effort to improve the learning

method that is able to activate the students and provide the presentation of chemicals that are more interesting, attractive, and interactive, so that students become more understanding and do not feel bored in following the learning of analytical chemistry in the classroom. One way to improve the quality of learning is to use the media.

Fun and non-boring learning can be done by adopting some simple games that exist in everyday life that can be used as a medium of learning, one of which is a monopoly game. There have been several previous studies that have proved that monopoly games can influence learning activities and student learning outcomes for better. Monopoly game helped students in connecting abstract theory with concrete experience [3]. Monopoly game-based learning motivated students to become active learners while offering alternative ways to interact and communicate with the system. On the other hand, it was fun to learn by doing from students' points of view [4]. Other research results were concluded that monopoly game could be enhanced engagement of students; introduction of concepts; introduction of problem solving and critical analysis skills [5]. The monopoly game was more effective than instructional videos at leveraging the benefits of mastery learning [6].

Based on the background and some previous research results those have been described above, then this study were aimed to determine student learning activities by using monopoly on the chemical separation and also to describe students' responses to the use of monopoly games in learning. In this study, the learning media used was a monopoly game, called chemopoly-edutainment that had been developed by researcher team. The formulation of the problem were: 1) How were the student's learning activities when media chemopoly-edutainment was used in chemical separation learning?, and 2) How were student responses to the use of chemopoly-edutainment media on chemical separation learning?.

Learning activities are the activities of learners during the learning process that includes oral activity, visual activity, emotional activity, and writing activities [7]. It has been added that learning activities are all activities undertaken in the process of interaction (educators and learners) in order to achieve learning objectives [8]. Activity learners during the learning process is one indicator of the desire or motivation of learners to learn. In addition, it was stated that learning activities are learning activities that must be carried out diligently, diligently, always trying to truly involve physical and mental optimally which includes visual, oral, listening, writing, drawing, motor, mental, emotional activities in order to get a brilliant achievement [9]. Thus it can be concluded that learning activities are deliberate activities that involve physical and mental in the learning process.

Responses by language are reactions, answers, backlashes. According to the term response is the response of a topic discussed by a learner or more. Response was the reaction of learners to the stimulus given at the time of study [10]. It has been defined that the response as the impression of the memory image of an observation [11]. It also defined that the response as a reciprocal of the communication made by the people involved in the communication [12]. According to Bigot, response is a shadow that remained in memory after observation. Based on several definitions of the response, it can be concluded that the response is an impression of the image obtained after getting stimulus from an observation using sensory devices that can be a negative or positive attitude [13]. Meanwhile, according to Kartono [14] that responses could be identified as a picture of the memory of observation. Students' responses are the acceptance, responses and activities that students provide during learning through the application of a learning approach [15]. Therefore, it can be concluded that response is a picture of the memory as a shadow that resides after we make observations or after we observe, in which the observed object is no longer in space and time of observation. Responses are classified in three parts: (a) The cognitive response is a perceptual response to the knowledge of skills and information about something that is believed, (b) Affective responses are an effective response to one's emotions, attitudes and judgments, and (c) Conative responses are action responses related to actual behaviour or habits [16]. The formation of a response is influenced by the impulses associated with a specific stimulus [10]. Further it has been stated that the response will occur if the cause factor is met, in this case means that there should be a stimulus that appeals to the respondent. The stimulus factors that influence the emergence of the response, namely: (a) Internal factors are factors that exist in self-respondent, that is spiritual and body. The existence of both elements greatly influence respondents in responding something. If one element is disturbed, the resulting response will be different. These two elements include existence, feeling, reason, fantasy, mental, and motivation. (b) External factors are factors that come from the environment (outside the self-respondent). The external stimulus must be strong enough to be recognized by the individual in order to generate a response. Stimulus that is less than the absolute threshold and the stimulus threshold will not be realized by the individual, so the response is not formed [17].

Monopoly has a square board, with each side having 10 squares on which a player's piece can land. Each player has a marker-perhaps a figurine-to mark his or her position of the board. A player rolls a pair of dice and moves the total of the two dice. Randomness is also involved in the two shuffled decks of cards

called Chance and Community Chest. Players are actively engaged in receiving and paying out money in buying and selling, and keeping track of their money and property. A player gradually learns effective strategies useful in becoming a better player [18].

## 2. RESEARCH METHOD

The type of this study was pre-experiment. As for the approach used in this study was a qualitative approach with a variety of research used was descriptive. This research has been conducted at Medan State University on September 2017. Selection of research subject was done by purposive that was determining subject with certain consideration which considered can give data maximally [19]. Subjects in this study were students of Chemistry Department, State University of Medan and took the chemistry of separation subject, which amounted to 36 people. Data were collected using observation sheet for students' activities learning, and questionnaire for students' responses. Data on learning activities and response were analysed using the percentage formula as in Equation (1).

$$\text{Learning activities} = (\text{score earned}) / (\text{maximum score}) \times 100\% \quad (1)$$

Data on observation of learning activities during the research activity were analysed using descriptive statistics [19] through scores as in Table 1.

Table 1. Activity Score

Level of Activity/Response	Qualification of Activity/response
80-100	Very active/Very good
66-79	Active/Good
56-65	Quite active/Enough
46-55	Less active/Less
0-45	Not active/Very bad

Chemopoly-edutainment that used in this study was the media that we have developed previously. Based on the developed result, the feasibility the chemopoly-edutainment was found to be 95.75 or very decent categorized. Based on the result, it was concluded that this media was feasible to be used in the learning process on chemical separation subject. Some parts of chemopoly-edutainment equipments are shown in Figure 1.



Figure 1. Some Equipments of Chemopoly-edutainment: (a) Board Game, (b) Pawns, (c) Material Book, (d) Try and Point Cards, (e), Problem Card, and (f) Guide Book

The aim of the game was to master all the plots on the board through purchasing, leasing, property exchange in a simplified economic system. Each player throws dice in turns to move the bottom, and when he/she lands in a plot that was not owned by another player, he/she could bought the plot according to the price stated. When the plot has been purchased by another player, he/she must pay the rent that the amount was also set. This game was played by 2-5 people who sit around the chemopoly-edutainment board and each participant has a piece that would be run based on the number of dice thrown and if the number of eyes was the same, it would got one more chance. The pawn journey started from the start box and then played back to start.

### 3. RESULTS AND DISCUSSION

Before the measurement of activities was done, the lecturer first explained to the students related to the lesson to be implemented. Lecturer prepared the necessary chemopoly-edutainment game equipment during the learning process. Before starting the learning activities, lecturer provided stimulus to the students in form of several questions related to the material to be studied. As for responses obtained, not all students responded to questions by providing pertinent answers. Then, lecturer responded by continuing to provide answers with regard to the question.

Furthermore, the learning process was done by using chemopoly-edutainment media. Students were divided into 7 (seven) groups, with each group consisting of 5 (five) students, and only one group consisted 6 (six) members, because the total number of students was 36 people. Each group received a set of chemopoly-edutainment media as described in the research method section of this paper. The lecturer then explained the full functionality of the media equipment and the game of chemopoly-edutainment before used.

After all the students understood and knew the procedure of playing, the lecturer asked the students to start using the media that has been distributed to each group. Then, each observer in each group made an observation of every activity that students did during play. Observation results were written on the activity observation sheet provided. Overall, the observations showed that students were very participated and active in learning chemical separation using chemopoly-edutainment. The observer was one of group members and lecturer those who has been deferred in detail about the overall observation activity. All students worked together among friends of a group. After the learning was completed, the questionnaire about their response was given to the students to be filled individually. The results of activities observed and students' response are described below.

#### 3.1. Students' Activities

Observation was started from the beginning of the learning to completion. Student activities consisted of 9 (nine) assessment criteria with scores of 1-4. Rating 1, 2, 3, and 4 were as an inactive, quite active, active and very active, respectively. The results of the student activity assessment can be seen in Figure 2.

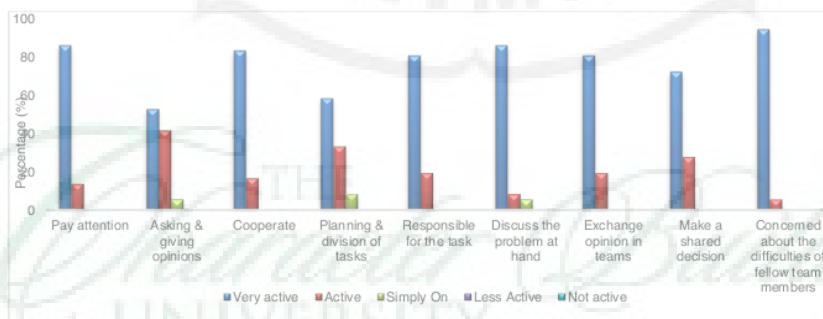


Figure 2. Students' activities

Students' activity in 'pay attention' showed that 86 percent of students were very active, and 14 percent were active. In addition, the activity of 'asking & giving opinions' there were 53 percent of very active students and 42 percent were active. While 'cooperate' activity found 83 percent of students were very active, and 17 percent of students were active. These might be due to the chemopoly-edutainment game

involved some reading, such as following a simple instruction. Finally, the game involved following rules, taking turns, and interacting in a civil manner with other players. When all of these learning and socialization opportunities were combined, the result was a very good learning opportunity. Then, other activities observed in this learning activity were 'planning & division of tasks', 'responsible for the task', and 'discuss the problem at hand'. The results showed that the number of highly active students for the three activities was 58, 81, and 86 percent, respectively. The results of this study were in line with Setiyorini & Abdullah [20] where disclosed that the use of media in learning could increase activity, in addition to motivation. Activities in question was the activity of students in understanding the material with different conditions, where students not only read but also could see an image displayed on learning. Learning activities with game media designed possibly students learn more relax and foster cooperation in learning [21].

Other observed activities, such as 'exchange opinion in teams', 'make a shared decision', and 'concerned about the difficulties of fellow team members'. The percentages obtained were of 81, 72 and 94 percent, respectively. The results of this study in accordance with some previous research results that found that the use of game media could fostered student activeness in learning and made students easy in understanding learning. The reason was because the media could changed the learning atmosphere becomes more fun because it was done while playing [22]. Based on the results of observation, the average of the overall students' activities were found to be 77 percent categorized as very active, and 20 percent were active. There were only 2 percent been simply on, and none of the students was inactive. It could be concluded that students' activities were good. It could be explained like the use of media in learning could create the condition of active students in social relationships when study, and understood each other and made the students' curiosity a new thing. Figure 3 shows the students' activities when play the chemopoly-edutainment.



Figure 3. Students' Activities

Overall, based on the results of student activities, it was concluded that learning using media in the form of games in the learning process could be increased student activity in learning. The use of media in learning to make learning conditions more excited and fun with the concept of learning while playing. Learning by using the media in the process of learning to create social relationships among friends and curiosity in learning in understanding the material. This was in line with the statement of Ananda [23] that the use of the game chemopoly media, the activity of the students was very active, so it was concluded that the media was feasible to be used and implemented in the learning process.

### 3.2. Students' Response

The students' response was provided into 7 (seven) criteria to be assessed. Each response was given a score of 4 for the category strongly agree, score 3 for agree, score 2 for less agree, and score 1 to disagree. The result of student response is shown in Figure 4.

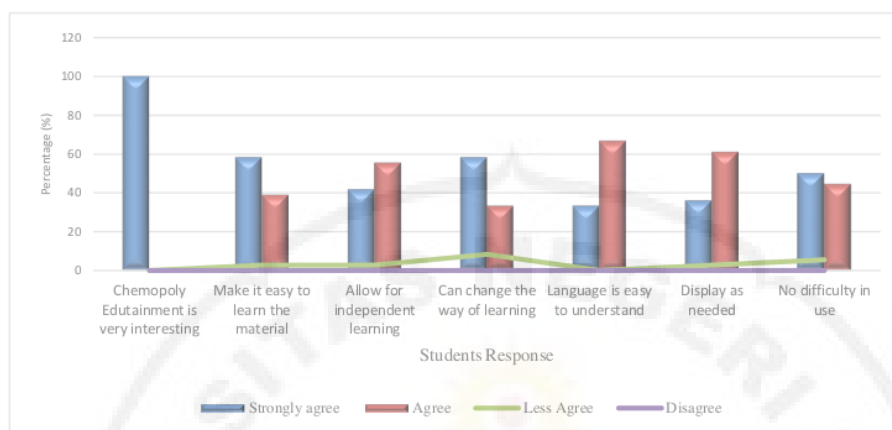


Figure 4. Students' Responses

Based on the results, students' responded to the statement 'learning using chemopoly-edutainment chemical separation was very interesting' found as many as 100 percent of strongly agree. These results indicated that the chemopoly-edutainment game was a very interested game in the chemical separation. Furthermore, a second statement that read 'chemopoly-edutainment could facilitated the study of separation chemistry' found as much as 58 percent of the students answered strongly agree and 39 percent agreed. In addition, the results of this finding indicated that there was a small percentage of 3 percent answered less agree. This figure means that at least students were helped in understanding the chemistry of separation by using chemopoly-edutainment. This was in line with Cesari, *et al.*, [24] that students initially found it difficult to accept new learning models that require them to think in advance about material concepts, but gradually students began to enjoy them. In the process of thinking about the discovery of the concept of the material that students did with the guidance of teachers, has given experience in students' mind compared with their usual learning process. So that the results obtained were more satisfactory both in the process and learning outcomes.

Students' eagerness on the statement 'learning with chemopoly-edutainment chemistry of separation allowed for self-study' found up to 42 percent of students answered strongly agree, and more students answered agree (56 percent). This percentage was almost equal. In addition, only 3 percent of students answered less agree. It means that students could learn chemical separation independently when learned to use chemopoly-edutainment. Independent in the sense of continuing to learn in groups, but not dependent on the presence of lecturers. Research from Setyasih and Siswandi [25] also concluded that the monopoly media deserve to be used as an independent learning media for learners. Other than that, the results of Jayanto and Sukirno [26] showed that the application of cooperative learning method of TGT technique with the help of akuntapoli media could improve learning activity. Next was the fourth revelation of whether 'chemopoly-edutainment could change the way students learn?' To this statement, 58 percent of students answered strongly agree, and 33 percent agreed. But there were as many as 8 percent of students who answered less agree. These findings suggested that there was a perceived difference, when learning the chemistry of separation by conventional methods such as lectures and learning to use the media, would be able to change the way learning becomes more productive. This findings coincided with Yanti & Anggraini, [27], where the influence of monopoly game smart learning media to results studying students in the field of history studies proved to improve student learning outcomes.

Apart from the responses related to learning, students were also asked to respond to the chemopoly-edutainment media itself. The statement on 'the use of sentences/grammar was easy to understand' on the media, found that more students who respond agreed (67 percent) and as many as 33 percent who stated strongly agree. However, there was no student expressed a disagreeable or disagreeable opinion. This suggested that although most responding students might still need the use of easier grammar for use in the chemopoly-edutainment medium. Simple grammar, might affect ease in understanding learning. Students' responses to the 'compatibility of the composition of the use of pictures and writings' on chemopoly-edutainment media were also included. The results of this study indicated that 61 percent of students stated agree, while 36 percent of students stated strongly agree, and 3 percent of students declared less agree. The latter was a response to the difficulties students may have overwhelmed while using chemopoly-edutainment.

As many as 50 percent of students strongly agreed that this media did not provide difficulties in its use, and 44 percent agreed, while less agree as much as 6 percent. The average of overall response showed that there were 54 percent strongly agreed, and 43 percent agreed, as well as 3 percent less agree. There was no student disagree. This results concluded that the response of students were found to be very good to the chemopoly-edutainment media and its application.

#### 1 4. CONCLUSION

Based on results of this study, therefore some conclusions are drawn as below a) the students' learning activities when chemopoly-edutainment media was used in chemical separation learning were found to be good; b) the students' responses to the use of chemopoly-edutainment media on chemical separation learning was found to be positive.

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