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Practicality And Effectiveness Game Snake Chemistry Ladder as a Learning Media on Material Reaction Reduction and Oxidation Class X SMA/MA

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ABSTRACT

This study is to examine the developed game snake ladder chemistry as a learning media to the real class. Objective study to disclose level practicality and level effectiveness game snake ladder chemistry as a learning medium on material Reaction Reduction and Oxidation class X MAN 1 Padang Panjang. Design study is One-Group Pretest-Posttest Design. Subject study is class X MIPA 3. Instruments study on test practicality form questionnaire practicality to teachers and participants educate and test effectiveness form question pre-test and completed post - test tested try it. Practicality data analyzed with percentage and effectiveness data with N-Gain. Based on results analysis of the data obtained, the teacher practicality is 91% (very practical) and participants educate on a small group by 86% (very practical), and test field-test obtained by 87% (very practical). Results analysis effectiveness obtained mark N-Gain by 76% with category effective. Based on results, study can conclude that game snake ladder chemistry as a learning medium on material reaction reduction and oxidation class X MAN 1 Padang Panjang very practical and effective.

1. Introduction

From analysis curriculum material reaction reduction and oxidation including into the type draft abstract. Material This load knowledge factual, conceptual and procedural, which requires ability in understand draft with method Lots do practice. With Thus, the learning process with draft the need Lots repetition with Lots reading, discussing and do exercise for participant educate. Giving exercise aim for steady draft participant educate to material studied (Yektyastuti, 2016). One possible business done that is with give method varied exercises like do exercise in form game.

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Learning media in form game make learning no rigid and no boring. According to Sadiman, et al (2018) method exercise form game own excess that is can increase interest participant educate for involved active in do question practice. One of the game media that can be used for material redox is a game medium Snake Chemical Ladder that has been modified.

Game as a learning medium will make participant educate more participate active in learning (Sadiman, et al. 2018). The advantage is learning media form game can help participant educate Study in a way group, grow soul competitive, prevent experienced boredom participant educate during the learning process and game can give bait come back so the learning process become no rigid and fun (Mahesti, 2021). Use of learning media form game expected participant become more motivated and active in learn material chemistry and more lots use up time for learn. This thing will very help participant educate in steady concept.

Use game as a learning medium can increase results study participant educate in accordance with a number of the researcher who wrote it in journal, which is revealing that use Ludo Kimia game as Chemo-edutainment media has significant influence to results study participant students who achieve percentage completeness competence participant educate. Next, research is carried out by Wahyuni (2021) concluded that use Ludo Kimia game as Chemo-edutainment media has significant influence to results study participant students who achieve percentage completeness competence knowledge participant educate amounted to 87.5% in material reaction reduction and oxidation as well as nomenclature compound in class X MAN 2 Padang.

Based on results of distributed questionnaire data to 2 chemistry teachers at MAN 1 Padang Panjang and 1 chemistry teacher at MAN 3 Padang Panjang obtained information that the training given by the teacher is sourced from book packages, LKPD, and hand out. Exercises given not yet make participant educate involved active in processing question practice, so influence stabilization draft results participant educate, then will influence results study participant educate.

Results distributed questionnaire to 70 participants educated in MAN 1 and MAN 3 Long Length, is obtained information mark test daily (UH) participants educate for material reaction reduction and oxidation on 2021 even semester by 44% of participants educate get mark on Criteria Minimum Completeness (KKM) and 56% of participants educate get mark under Criteria Minimum Completeness (KKM). KKM set at school the is 76. It is signify that results Study participant educate Still many people get it mark under KKM. One possible business done is with give exercise in form game.

Based on the description above, when this already availability of learning media in form developed game by Adelina and Iswendi (2021) has been tested validity with mark Aiken V scale 0.82 with category very valid, but not tested yet level practicality and its effectiveness. Based on explanation above, research with title "Practicality And Effectiveness Game Snake Chemistry Ladder as a Learning Media on Material Reaction Reduction and Oxidation Class X MAN 1 Padang

Panjang” was carried out with objective for determine level practicality And validity of the media.

2. Methodology

Study this is study advanced development *Plomp*. Study held month February until June 2022 at MAN 1 Padang Panjang. Design study is *One-Group Pretest-Posttest Design*, with method compare results *pre-test* and *post-test* class sample. Form design study served on Table 1.

Table 1. Design One-Group Pretest-Posttest Design Research

| Group | Initial Test | Treatment | Final Test |
|-------------------|----------------|-----------|----------------|
| Class Sample (R') | O ₁ | X | O ₂ |

(Sugiyono, 2014)

Description:

R' : Subject (class sample)

X : Practice use game snake ladder chemistry

O₁ : Test beginning for class sample

O₂ : Test end for class sample

Population in study is all over participant educate class X consisting of from 3 classes namely X MIPA 1, X MIPA 2 and X MIPA 3 at MAN 1 Padang Panjang in even semesters year 2021/2022 teachings. Sample taken 1 class with technique *Purposive Sampling*. Technique *Purposive Sampling* is technique taking sample with consideration certain (Sugiyono, 2014). Class sample consists of 33 participants educate. Variable study are:

- Variable Free (Variable Independent) is causal variables emergence variable dependent (variable dependent) (Sugiyono, 2014). Variable independent in study that is class sample provided treatment use game snake ladder chemistry as a learning medium.
- Variable Bound (Variable Dependent) is influenced variables Because exists variable independent (variable independent) (Sugiyono, 2014). Variable bound on study is results Study participant the education obtained from mark *pre-test* and *post-test* on class sample.
- Variable Control is controlled variables so that No influence variable free and variable bound (Sugiyono, 2014). Variable control in study namely the teacher who teaches in the classroom samples, material taught, allocation time and book learning used.

Data used for test practicality namely quantitative data and qualitative data. Practicality instrument form sheet teacher questionnaire and participant educate and effectiveness form question *pre-test* and *post-test*. Technique analysis practicality done with formula following:

$$\text{Practicality value} = \frac{\sum \text{student scored}}{\text{maximum score}} \times 100\%$$

Following this is table criteria giving mark practicality served on Table 2.

Table 2. Criteria Giver Mark Practicality

| No | Percentage (%) | Criteria |
|----|----------------|----------------------|
| 1 | 86% - 100% | Very Practical |
| 2 | 76% - 85% | Practical |
| 3 | 60% - 75% | Enough Practical |
| 4 | 55% - 59% | Not enough Practical |
| 5 | ≤ 54% | No Practical |

(Purwanto, 2016)

Technique data analysis for test its effectiveness is N. Gain. As for criteria *N-Gain* can served on Table 3.

Table 3. Criteria *N-Gain*

| Percentage (%) | Interpretation |
|----------------|----------------------|
| <40 | No Effective |
| 40 – 50 | Not enough Effective |
| 56 – 75 | Enough Effective |
| >76 | Effective |

(Sundayana, 2014)

Test *N-Gain* aim for disclose effectiveness of the media used with know level understanding participant educate before and after he gave treatment based on results *pre-test* and *post-test* on class sample.

3. Results and Discussion

Study advanced this using a development model *plomp*. Subject on study this that is student class X MIPA 3 MAN 1 Padang Panjang. Instrument study on test practicality form questionnaire practicality to teachers and participant educate And test effectiveness form *pre-test* questions and *post-test* that has been tested try it. Test practicality done to 2 chemistry teachers and 33 participants educate class X MIPA 3 at MAN 1 Padang Panjang as shown on Figure 1.

Data obtained in the form of results data test practicality and test effectiveness. Results data test practicality served on Table 4, Table 5 and Table 6. Values the average practicality obtained from the chemistry teacher by 91% with category very practical served on Table 4.

Table 4. Table Results Practicality by Chemistry Teacher.

| Aspect | P | Criteria |
|--------------------------|-----|----------------|
| Convenience Use | 92% | Very Practical |
| Efficiency Time Learning | 87% | Very Practical |
| Benefit | 93% | Very Practical |
| Criteria Practicality | 91% | Very Practical |



Figure 1. Test Practicality Game Snake Ladder

Mark the average practicality obtained from participant educate on test *small group* by 86% with category very practical served on Table 5.

Table 5. Results Practicality test *small groups* By Participant Educate

| Aspect | P | Criteria |
|--------------------------|-----|----------------|
| Convenience Use | 85% | Practical |
| Efficiency Time Learning | 84% | Practical |
| Benefit | 89% | Very Practical |
| Criteria Practicality | 86% | Very Practical |

Mark the average practicality obtained from participant educate on test *field-test* by 87% with category very practical served on Table 6.

Table 6. Results Practicality Field-Test Test by Participant Educate

| Aspect | P | Criteria |
|--------------------------|-----|----------------|
| Convenience Use | 86% | Very Practical |
| Efficiency Time Learning | 86% | Very Practical |
| Benefit | 88% | Very Practical |
| Criteria Practicality | 87% | Very Practical |

Test effectiveness obtained from results study participant educate. Results data Study participant educate obtained from results *pre-test* and *post-test* form question objective as many as 20 items question with 5 choices answers taken of the 40 questions that have been asked tested try it.

H results *pre-test* and *post-test* participant educate on class sample. Mark *pre-test* Lowest namely 15 obtained by 3 participants educate, meanwhile mark highest is 60 obtained by 2 participants educate. *Pre-test* average score on class sample is 37.58. Mark *post-test* Lowest I.e.70 is obtained by 1 participant educate and mark highest namely 95 obtained by 1 participant educate. *Post-test* average score is 85 so obtained percentage completeness by 94%. Criteria Minimum Completeness (KKM) at MAN 1 Padang Panjang which is 76 so mark *post-test* participant educate moretall from mark *pre-test* before he gave treatment served on Table 7.

Table 7. Class Pre-Test and Post-Test Results Sample

| Participant No Educate | Mark | |
|------------------------|----------|-----------|
| | Pre-test | Post-test |
| 1 | 35 | 85 |
| 2 | 30 | 85 |
| 3 | 20 | 80 |
| 4 | 50 | 90 |
| 5 | 60 | 85 |
| 6 | 50 | 90 |
| 7 | 55 | 90 |
| 8 | 25 | 80 |
| 9 | 15 | 75 |
| 10 | 50 | 90 |
| 11 | 50 | 85 |
| 12 | 45 | 80 |
| 13 | 25 | 90 |
| 14 | 35 | 85 |
| 15 | 60 | 95 |
| 16 | 35 | 85 |
| 17 | 50 | 90 |
| 18 | 55 | 90 |
| 19 | 20 | 80 |
| 20 | 40 | 80 |
| 21 | 15 | 70 |
| 22 | 40 | 85 |
| 23 | 45 | 85 |
| 24 | 35 | 80 |
| 25 | 30 | 80 |
| 26 | 45 | 85 |
| 27 | 40 | 90 |
| 28 | 20 | 90 |
| 29 | 15 | 80 |
| 30 | 25 | 90 |
| 31 | 45 | 85 |
| 32 | 55 | 90 |
| 33 | 25 | 85 |
| Amount | 1240 | 2805 |
| Average | 37.58 | 85 |

Data obtained from *pre-test* and *post-test* processed and analyzed with use test *N-Gain*. Test *N-Gain* done for know level effectiveness of the media used, through level understanding participant educate before and after he gave treatment based on results *pre-test* and *post-test* on class sample. Average *N-Gain* on test *small group* by 73% with category enough effective served on Table 8.

Table 8. Results Test *N-Gain* on Class Sample (Test *small group*)

| Class | Average <i>N-Gain</i> | Criteria |
|--------|-----------------------|------------------|
| Sample | 73% | Enough Effective |

Raverage *N-Gain* on test *field - test* by 76% with category effective served on Table 9.

Table 9. Results Test *N-Gain* on Class Sample (Field -Test)

| Class | Average <i>N-Gain</i> | Criteria |
|--------|-----------------------|-----------|
| Sample | 76% | Effective |

Test practicality and test effectiveness done on stage *small group* and *field - test*, explained as following:

A. Practicality

a. Aspect Convenience Use

Based on results questionnaire data processing test practicality, obtained mark percentage for aspect convenience use from teacher response was 92% with category very practical. Results response participant educate as big as on test *small group* by 85% with category practical and test *field - test* by 86% with category very practical. This thing because the media is structured in a way systematic and be equipped with instruction clear use and easy language understood.

This thing in accordance with opinion Setyosari (2018) said that it is a practical medium is an easy medium used. Game snake ladder chemistry have design attractively equipped with picture on board games, so make participant educate become more easy in learn. This thing in accordance with opinion Mardiati (2015) who said that with exists help from existing images on game snake ladder make participant educate more easy in learn.

b. Aspect Efficiency Time

From aspect efficiency time learning obtained average practicality from teacher response was 87% with category very practical. Response from participant educate on test *small group* by 84% with category practical and results *test filed* practicality average *test* participant educate obtained by 86% with category very practical. This thing show game snake ladder chemistry own efficiency good time for used participant educate in study in accordance with ability and speed learn it yourself. According to opinion Suciati (2021) usage game snake ladder chemistry can help teachers in steady draft participant educate, so time learning become more efficient. Media game snake ladder kimia can done anywhere and any time with simple facilities.

c. Aspect Benefit

From aspect benefit game snake ladder chemistry obtained average practicality value from teacher response was 93% with category very practical. Results practicality from participant educate on test *small group* obtained an average of 89% with category very practical, test *field tests* obtained by 88% with category very practical. This thing show that game snake ladder chemistry can increase motivation and interest Study participant educate, so can help participant educate in steady concept, creating a learning process become more fun. This thing also in accordance with opinion Sadiman (2018) stated that game can increase motivation

study participant educate so that can help participant educate in increase understanding draft as well as heighten power absorb or retention study participant educate.

From third aspect practicality in on can concluded that game snake ladder chemistry material reduction and oxidation class X SMA/MA on test *small group* and test *field test* obtained mark practicality by 86% with category very practical and for teachers obtained mark practicality by 91% with category very practical.

B. Effectiveness

Effectiveness game snake ladder chemistry as a learning medium on material reaction reduction and oxidation seen from results study participant students who are measured through percentage completeness and percentage *N-Gain*. Based on results study obtained results percentage *N-Gain* on class sample test *small-group* by 73% with category enough effective and on test *field-test* by 76% with category effective. This thing showing percentage *N-Gain* on test *field-test* more tall than test *small groups*. This thing because on test *small group* done to class XI already quite a long time to study material reaction reduction and oxidation so that a number of participant educate many do n't remember about material reaction reduction and oxidation.

This thing also caused Because Power competitive on test *small group* more low than test *field test*, because amount participant educate on test *small group* more A little than test *field tests*. This thing also because not yet availability a medium that can increase motivation study and participation active study participant educate because of the learning process in that semester still done in a way *on-off* and giving material as well as task through book packages, worksheets and *power point*.

Game snake ladder chemistry make participant educate involved active in stabilization draft in a way independent, so make material will the longer it lasts remembered participant educate compared to understand material through task read as implemented by school specifically on moment learn material reaction reduction and oxidation. This thing in accordance with cone experience *Edgar Dale* put forward by Sari (2019) who said that participant educate will the more easy remember material learning moment participant educate involved And experiment in a way straight away.

Based on percentage completeness study participant educate obtained with count amount participant students who achieve mark Criteria Minimum Completeness (KKM), specified KKM school is 76. Gain results *post-test* on class sample test *small group* 9 out of 12 participants were found educate get mark reach KKM, so obtained percentage completeness by 75%. Results *post-test* test *field-test* 31 of the 33 participants received it educate get mark reach KKM, so obtained percentage completeness by 94%. This thing in accordance with opinions expressed by Muthoharoh (2017) who said that a learning medium or device

supporter said effective that is Category Minimum Completeness (KKM) learning participant educate is 75% of amount participant educate.

Criteria a medium is said effective wrong the only one is where moment use game snake ladder chemistry this response participant educate become positive, because game this in accordance with character participant educate those who like it play and like do exercise in a way group. This thing in accordance by opinion Suryani, N (2016) stated that a learning medium or device supporter learning said effective if own a number of characteristic features Wrong the only one is response participant educate to the media used positive.

Effectiveness game snake ladder chemistry as a learning medium Also Can seen from a number of criteria, among others costs incurred comparable with results learning achieved participant Educate, conciseness of game media snake ladder chemical used covers all fill material reaction reduction and oxidation, time required in use game snake ladder chemistry can customized, game media snake ladder chemistry easy used because be equipped with regulation clear game on board game.

This thing in accordance with opinion Badriah (2015) revealed criteria in evaluate effectiveness use a medium, namely costs incurred in accordance with results learning achieved, availability facility supporters, media compatibility with size class, conciseness, ability for changed, time and setup in media use can customized, as well complexity and easy use of media understood and applied.

Obstacles faced in study are:

1. When the game had started some of the coordinators were still wondering about the rules of the game, so It takes time for the group to start the game. From 6 groups only 3 groups finished game reach *the finish*. This is because there are many questions in the form of chemical reaction equations. Previous researchers have looked for alternatives to ensure efficient implementation, namely by increasing the number of questions so that the coordinator can show difficult questions to the players, such as questions with reaction equations, in order to maximize the time available for doing the exercises. Previously, one day before the game was held, the researcher also provided an explanation of the game rules to the students, in order to save time.

The next obstacle faced was that when dividing groups, some students did not agree with the distribution of group members that had been formed by the teacher because some of the students wanted to be in a group with friends they liked and were close to. However, this can be overcome with deep guidance and direction group discussion so that heterogeneity can be removed.

4. Conclusion

Based on results research, data processing and data analysis from practicality and effectiveness game snake ladder chemistry, it can be concluded that the first, the

games snake ladder chemistry as a learning medium on material reaction reduction and oxidation class X MAN 1 Padang Panjang own level practicality category very practical. Second, games snake ladder chemistry as a learning medium on material Reaction Reduction and Oxidation effectively used class X at MAN 1 Padang Panjang. The research is generally successful because the developed media is really beneficial for the students. This means, the developed media is ready to use in the real class in the near future.

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