



## **Development of Emulsi (electronic module practicum articulate storyline 3) to Support Self-Regulated Learning of Students**

**Ali Sadikin<sup>1\*</sup>, Risa Dwita Hardianti<sup>1</sup>**

<sup>1</sup>Science Education Study Program, Faculty of Mathematics and Natural Sciences,  
Universitas Negeri Semarang, Semarang, Indonesia 50229

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\*Corresponding author:

**Ali Sadikin**

Universitas Negeri Semarang

E-mail: sadikin@student.unnes.ac.id

### **Abstract**

The aim of this research is to develop Emulsi (electronic module practicum articulate storyline 3) to support self-regulated learning (SRL) of students which is valid and effective. This research is research and development and the subjects of this study are students of class VIII F of SMP Negeri 1 Ungaran. Data collection techniques in this study used validation sheets, tests, and students self-assessment sheets in SRL. This research begins at the Emulsi design then validated by validators with details on the average results of material (85%), linguistics (95%), media (80%), pretest and posttest construct questions (75%), syllabus (97%), lesson plans (95%), students self-assessment sheets in SRL (87%), the rubric for the assessment of the practice report (76%). The results of student learning pretest scores (36.11%) posttest scores (100%) and final scores obtained from the average value of the practicum report and posttest scores (77.77%). The result of N-gain is 0.73 indicating high criteria. The results of the self-assessment score in SRL is 75% or 27 of 36 students. Based on the results of the study, it can be concluded that the Emulsi can be said to be valid and effective to support the SRL of students

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## INTRODUCTION

The spread of COVID-19 in Indonesia is increasingly widespread, this results in the uncertainty of when the spread of this virus will end and has an impact on the learning system in Indonesia. COVID-19 does not only occur in Indonesia but throughout the world, causing the formation of online learning regulations and the issuance of orders to close all educational buildings around the world (UNESCO, 2020). The strategy taken by the Indonesian government to reduce the spread of this virus is to make a policy for students through out in Indonesia is to study at home or implementation of the distance learning system and postpone face-to-face learning in red zone areas in the even semester of the 2020/2021 (Ministry of Education and Culture, 2020).

The implementation of the distance learning system requires educators to migrate from face-to-face education to online education by utilizing technology (Basilaia and Kvavadze, 2020). The use of appropriate technology in learning activities can provide experiences and improve individual learning, support and encourage independent and collaborative learning or self-regulated learning (SRL), increase the involvement of prospective educators in learning, and provide flexible learning, anytime and anywhere (Martin et al., 2015). This is in line with Anggraeni (2017) which states that students have an interest in high regard for an object that causes attention and pleasure in learning both in terms of knowledge, attitudes, and skills.

Creswell (2015) says that student learning outcomes cannot stand alone. Student learning outcomes are an accumulation of various factors that affect students, both internal and external factors. One of the internal factors that affect student learning outcomes is SRL. Study Fajriyah et.al. (2019) concluded that SRL has a positive effect on the reasoning ability of students by 46.6% so that it affects student learning outcomes. Study Hendikawati (2019) concluded that electronic-based media is valid as a learning resource to improve SRL and student learning outcomes. Daumiller and Dresel (2019) in his research concluded that the existing motivations and regulations can support the increase in SRL with the help of digital media.. The results of this study are in line with Damayanty's (2017) statement that the factor that must be possessed by students is SRL, so that students have a high attitude of responsibility and discipline so that learning achievement increases. Therefore, SRL is an important indicator in the implementation of distance learning system. Winne (2018) states that SRL is the ability of students to generate and monitor their own thoughts, feelings, and

behavior to achieve an academic or socio-emotional goal. Based on the research above, it can be concluded that SRL is very influential in achieving student learning outcomes

Based on the results of observations made at SMP Negeri 1 Ungaran from October to November 2020 in the implementation of Field Experience Practices. Analysis of the 5 SRL indicators developed by Winne (2018) in class IX F and H students of SMP Negeri 1 Ungaran, as many as 61.9% of students said the implementation of learning was not contextual, 42.9% of students did not have self-confidence and had not been able to develop mental owned, 28.6% of students have not been able to develop their skills, 47.6% do not have high motivation, and 100% of students are able and master science and technology. Based on the analysis of Winne's SRL indicators (2018), the most influential indicators are contextual and high motivation. High motivation when analyzed more deeply shows that as many as 57.1% of students do not have high motivation in the distance learning system and 38.1% of students do not have high motivation to learn using application-assisted learning media. Based on the results of the preliminary questionnaire, it can be concluded that 52.4% of students have difficulty in carrying out independent learning in the distance learning system.

The difficulty in carrying out independent learning is influenced by several factors such as the absence of a manual, never using learning applications (phet, laboratory simulator), and the learning media used are not interactive. A total of 66.7% students need a blend in carrying out learning in theory and practice, and 57.1% of students said that the use of modules as learning media affects their learning outcomes. These results are the basis for why media is needed in the implementation of learning. Basic competencies 4 which is include; trying, processing, presenting, modifying and making (Permendikbud, 2016) cannot be carried out in the distance learning system because of constraints in the allocation of learning time. One of the efforts to achieve basic competencies 4 in learning activities is practicum-based learning activities.

The implementation of the practicum requires media (modules) as a reference for students in carrying out practical activities. The characteristics of science practicum are carried out through scientific investigations that involve the knowledge, skills, and attitudes that students develop when investigating their natural world. To be able to carry out these research activities, media (modules) are needed. Lliwellyn (2011) stated that one of the media that can be used to conduct an investigation is a module. The

majority of schools in Indonesia still use printed modules in the implementation guide for practicum activities. Therefore, an electronic practicum module is needed to replace the printed module. One of the devices that can be used for making electronic practicum modules is articulate storyline 3 (AS3).

According to Hadza et.al. (2019) stated that AS3 is a software for creating electronic-based learning media. Cahyani et.al. (2020) stated that AS3 is software that can be used as files and learning information as well as interactive multimedia applications that can be used by teachers or students in HTML5 format that can be converted into android-based applications and installed on smartphones.

### METHOD

This research is a Research and Development (R & D) which aims to develop Emulsion (electronic practicum module articulate storyline 3) to Support Self-Regulated Learning of Students by paying attention to two aspects of quality, namely valid and effective.

The subjects of this study were students of class VIII F of SMP Negeri 1 Ungaran, Semarang Regency. This research was carried out from April to August 2021. Validation data consisted of material, linguists, media, pretest and posttest questions, syllabus and lesson plans, self-assessment sheet in students' SRL, and rubric for report assessment. practicum, each of which consists of two validators.

These development steps use the ADDIE model development method (Branch, 2009) with 5 steps is Analyze (analysis of SRL questionnaires at SMP N 1 Ungaran), Design (Emulsi design), Develop (creation of Emulsi using the AS3 application, expert validation, revision), Implement (preparation of the learning environment, students, teachers, and trials), Evaluate (evaluate at each step).

The data collected in this study consisted of: validation (to determine the validity of the Emulsi before it was implemented in learning) which is the validation instrument uses the Sudijono (2008) formula as Equation 1.

$$P = \frac{f}{N} \times 100\% \quad (1)$$

Information:

- $P$  = percentage variable
- $f$  = total score in variable
- $N$  = maximum number of scores

The percentage results of each variable are then decategorized as in Table 1.

Table 1. Percentage and category

Percentage	Category
86-100	Very Valid
76-85	Valid
52-75	Quite Valid
26-51	Less Valid
0-25	Invalid

(Sudijono, 2008)

The student learning outcomes and self-assessment sheets in the student's SRL (to determine the effectiveness of the Emulsi after it was implemented in learning). The data collection techniques are as follows: (1) Emulsi validation is generated based on expert, (2) learning outcomes (pretest scores, posttest scores, practicum reports, and final scores), (3) self-assessment questionnaires in participants' SRL.

### RESULT AND DISCUSSION

The results of this study include the results of the validation of material experts, linguists, and media experts, validation of pretest and posttest questions, validation of syllabus and lesson plans, validation of self-assessment sheets in students' SRL, validation of practicum assessment rubrics, and student learning outcomes. Based on the results of research at SMP Negeri 1 Ungaran on Integrated Science learning with the main material of nutrition in class VIII F.

Validators have assessed the Emulsi and provided notes for the improvement of the Emulsi before it was implemented in learning. The results of expert validation are presented in Table 2 and the Emulsi implementation stage, it was carried out in class VIII F of SMP Negeri 1 Ungaran with learning outcomes presented in Tables 3 to 6.

Validity is the first factor in development research. Emulsi validity data were obtained from validators validation data including (material, language, media), construct validation of pretest and posttest questions, syllabus and lesson plans validation, validation of self-assessment sheets in students' SRL, and validation of rubrics for assessing practicum reports. Based on Table 2 shows that all of the data in this study were declared valid by validators so that can be implemented in learning.



Figure 1. Display of Emulsi design

Table 2. Validation results

Validation Results	Percentage	Category
Material	85.15%	Valid
Language	95%	Very Valid
Media	80%	Very Valid
Pretest and Posttest	75%	Quite Valid
Questions		
Syllabus	97.5%	Very Valid
RPP	95.5%	Very Valid
Self-Assessment Sheet in SRL Learners	87.5%	Very Valid
Practicum Report Assessment Rubric	76%	Valid

Table 3. Pretest and posttest scores

Data	Class VIII F	
	Pretest	Posttest
Number of students	36	36
The highest score	93.33	100
Lowest value	40	80
Average	62	90
$\sum$ pesert didik tuntas	13	36
$\sum$ pesert didik tidak tuntas	23	0
Classical completeness	36.1%	100%

Table 4. Analysis of N-gain test

Aspect	Member of students	Average	N-gain	Criteria
Pretest	36	62	0.73	Tall
Posttest	36	89		

Table 5. Practicum Report Value and Final Score

Data	Class VIII F	
	Practical Report	Final score
Number of students	36	36
The highest score	97.50	97.50
Lowest value	57.5	68.75
$\sum$ pesert didik tuntas	10	28
$\sum$ pesert didik tidak tuntas	26	8
Classical completeness	27.77%	77.77%

Table 6. Self-Assessment in SRL Students

Aspect	Class VIII F
Number of students	36
The number of students reached the effective criteria	27
Effective Criteria	75%

The implementation stage was carried out in real learning in class VIII F of SMP Negeri 1 Ungaran with 36 students with 14 male students and 26 female students. The selection of class VIII F was done because the class was not a superior class.

Effectiveness is the second factor in research and development. Effectiveness indicates the achievement of research and development objectives to be achieved. Emulsi can be said to be effective if: (1) 75% or 27 students get the final score (mean posttest scores and practicum reports) with the Minimum Completeness Criteria (MCC) for SMP Negeri 1 Ungaran is 80, (2) 75% or 27 students get score  $\geq 76$  on self-

assessment in SRL learners. Emulsi effectiveness data is obtained from the results of the implementation of the Emulsi in learning. In this study, the posttest questions and self-assessment sheets in the students' SRL were done by students through the google form. The results of the pretest and posttest scores are presented in Figure 2.

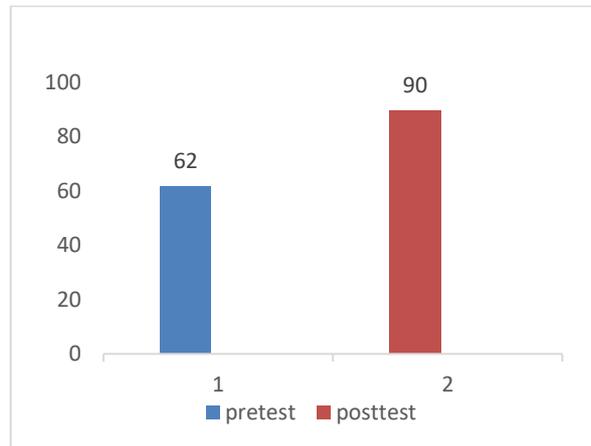


Figure 2. Results pretest and posttest scores

Based on the results of the analysis of the N-gain test, the results of the students' pretest and posttest scores in Table 4 show the criteria for High. The final score of students is obtained from the average posttest score and the value of the student's practicum report. The results of the analysis of the students final scores are in Table

5 which shows that the number of classical completeness of students reaches 77.77% or 28 students so it can be said that Emulsi is effectively used in learning. Data the results of self-assessment in the SRL of students presented in Figure 3.

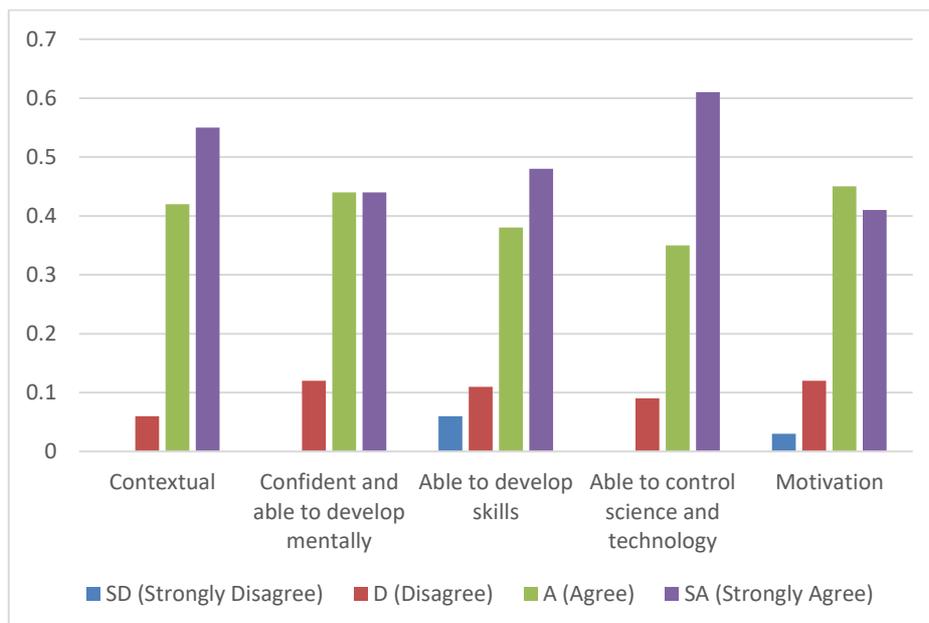


Figure 3. Self-assessment results in students' SRL

Based on Figure 3 shows that the 2 SRL indicators scored 4 (strongly agree) more than 50%, namely contextual and mastering science and technology. This is in line with the SRL indicator proposed by Winne (2018) that learners have the initiative to be able to connect learning that is relevant to everyday life and have expertise in mastering the latest science and technology that is relevant to learning. These results are very relevant to the statement Llewellyn (2011) states that the module is one of the media that can be used to conduct investigations to create contextual learning. In addition, these results are also relevant to research of Hendikawati (2019) that electronic-based media is valid as a learning resource to improve SRL and student learning outcomes. Therefore, based on the results of the self-assessment sheet in the SRL of students, it can be said that the developed Emulsi is effectively used to support the SRL of students in the distance learning system.

In addition to the data above, the researcher conducted interviews with 4 students who gave an assessment with a score of 1 or 2 on 3 SRL indicators (confident and able to develop mentally, able to develop skills, and motivation) in order to obtain the reasons for these students giving a score of 1 or 2 on the self-assessment sheet in the student SRL. The results of the interview are as follows: (1) students have not been able to develop self-confidence, this is influenced by the inability to speak in public. (2) students have not been able to develop skills in implementing practicum independently according to Emulsi and have not been able to develop skills in writing practicum reports because according to participants Emulsi is less understandable on the media aspect in Emulsi which is less interactive and less informative. (3) students have difficulty in carrying out practicum independently, this affects the timeliness in collecting practicum reports and skills to develop practicum reports because students find it difficult to find materials for practicums individually independently according to the Emulsi. Based on the results of interviews regarding the responses of the four students above, it can be concluded that Emulsi still needs to be developed again, so that it can improve the SRL of students in the distance learning system.

## CONCLUSION

Based on the results of the study, it can be concluded; The developed Emulsi is valid to be used in learning to support self-regulated learning of junior high school in science students. The developed Emulsi is effective for use in junior high school learning to support self-regulated learning of junior high school in science students. Some suggestions based on the results of this study are; (1) The Emulsi that has been developed in this study can be used for learning in different classes and schools. (2) Emulsi can be redeveloped with the help of more professional experts in the media field, so as to improve the quality of the graphics and minimize the lag between slides that are too long. (3) Emulsi can only be installed on android so for students who use iOS (iPhone Operating System) can prepare their smartphone specifications, so they do not interfere with learning. (4) Emulsi can be developed more interactively and educatively so that they can improve the SRL of students. (5) Emulsi can be developed for elementary, junior high school, and senior high school. (6) Students should be given science practice tools or allowed to explore in the use of practicum materials for practicum activities independently on the distance learning system.

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