

HYPERMEDIA DEVELOPMENT AS SELF-REGULATED LEARNING RESOURCES FOR HIGH SCHOOL ENGLISH DEBATING TRAINING

Ubaidah

Primary Teacher Education Department, Faculty of Humanities, Bina Nusantara University
Jakarta, Indonesia 11480
ubaidah@binus.edu

ABSTRACT

This research was aimed to develop Hypermedia as an alternative learning resources that support self-regulated learning implementation for English Debating Training in Highschool. The product was developed by the framework of web-based learning environment development model. To ensure the effectivity of the product, hypermedia was tested on formative and sumative evaluation involving expert, teacher, and students as participants. At the end of the study, the product was found effective which is indicated by (1) 80% of students often use this hypermedia at their home as self-regulated learning resources, (2) the improvement of students debating knowledge which indicated by the improvement test result by 3.3 poin, and (3) outstanding the students' achievement of debating competencies that 50% of the students have above average debating skills after learning with hypermedia "Enjoy Your Debate!".

Keywords: *hypermedia; self-regulated learning resources; self-regulated learning*

INTRODUCTION

It's generally known that our environment is rapidly change as well as the revolution of human's learning needs. Through the integration of information and communication technology (ICT), learning become more seamless and flexible, so teacher no longer become the only accessible learning resource for student. Thus, become a new trend of learning that direct us to self-regulated learning. Therefore, the alternative learning resource is important to ensure everyone can be facilitated to learning, both organized learning and self-regulated learning.

As stated in revolution of education theory by Sir Isaac Ashby that mention the emerging of information and communication technology in education give a big impact in order to break the boundaries from geographical, social, and politics issues (Tuomi, 2013). Therefore, the idea of developing new learning resources that integrate information and communication technology gives a promising prospect in order to increase the quality of learning, more intense than traditional learning resources. The existence of new learning resources at least can enrich the learning process.

Learning resources in an instructional system have a fundamental role in order to increase the perception of students, increase the knowledge, increase the learning experience, and as a learning reinforcement to increase the retention of students (Brand-Gruwel, Kester, Kicken, & Kirschner, 2014; Prawiradilaga, 2012). A good learning resources will have ability to facilitate students for an effective learning (Pawlowski & Bick, 2012). The urgency in developing new learning resources that are integrating information and communication technology arise by the needs of self-regulated learning where students can learn wherever and whenever, even without the assisting of their teacher (Miarso, 2007).

Self-regulated learning is learning process that trigger students to actively construct their own knowledge whereby learners set goals for their learning and then attempt to monitor, regulate, and control their cognition, motivation, and behavior on learning, guided and constrained by their goals and the contextual features in the

learning environment (Jakešová & Kalenda, 2015; Wong, Khalil, Baars, de Koning, & Paas, 2019). The intrinsic aspect of learner take an important role in direct the effectivity of learning, because students needs to develop their own strategy to be succed on their learning. Students who perceived a certain object as interesting, important and useful used more often selfregulatory strategies, therefore it is important to add some interesting object to enhance students motivation in self-regulated learning.

One of the potential resources to support the needs of self-regulated learning is hypermedia. Hypermedia is an emerging of multimedia and text that integrated in one united system with nonlinear information access (Brusilovsky, 2012; El Janati, Maach, & El Ghanami, 2018; Mampadi, Chen, Ghinea, & Chen, 2011). The potential point of hypermedia as learning resources is its high flexibility and similarity with human brain work systems. This condition gives benefit for learning, because it can increase the awareness, cautions, learning styles, and learning motivation for students (Campbell, 2004; Kommers, 2014). Besides of that, the characteristics of hypermedia with layering of information and high environmental interaction can facilitate personalized learning based on individual learning needs of students (Kommers, 2014).

On the other hand, there are some factors in Hypermedia that could be challenge in using hypermedia as learning resources. Hypermedia has tendency in creating disorientation as it have non-linier hyperlink structure, it can make young learner easy to lost their track (Kommers, 2014). To avoid the disorientation on using the hypermedia, developer should provide clear navigation to make user realize where are they and where to go after one session. On the other hand, user need additional skills on using hypermedia such as operating computer, digital literacy, and other related using computer on learning with hypermedia. This point also could be a challenge for developer, to develop easy use hypermedia then it will not give additional burden for user. However, ICT using nowadays become very familiar then every part of society already get used on using computer, it will be more easy to difuse the using of hypermedia in society nowadays.

This research focused on developing hypermedia as self-regulated learning resources to facilitate self-regulated learning in English debating training for high school students. Considering the lack of resources in English debating training that facilitate students in self-regulated learning, the development of hypermedia as learning resources will at least enrich students with flexible, attractive, and personalized resources that support the learning process. The “Enjoy Your Debate!”hypermedia is addressed to use as learning resources that support self-regulated learning in English Debating Training in 51 Vocational Highschool.

METHOD

Research and Development (R&D) method was used in this research, whereas the framework of development process in this research referee to framework on development model from Web-Based Learning Environment model by Hall, Watkins, and Eller (Hall, Watkins, & Eller, 2008). There are three main phases in this model; directionality, design, and accountability. Based on the development model of Web-Based Learning Environment, the indicators of product effectiveness encompass the frequency of students on using hypermedia product as self-regulated learning resources, the improvement of conceptual knowledge, and the students' achievement of expected competency.

The participants involved in this research are experts (media expert, content, and instructional design expert) as reviewer, the members of English Debating Club in 51 vocational high school Jakarta as the users of this hypermedia, and the debating training coach. The member of this English Debating Club are students on 10th and 11th grade in 51 vocational high school that have good English skills and interest on debate.

The first development step is *directionality*. In this phase, we focused on set the direction of learning through needs analysis procedures. The needs analysis was conduct through: 1) Identification of audience or students: this step was conducted by interviewing the teacher coordinator of English debating training in 51 vocational high school, members of English Debating Club, coach, and also administrative data treasury in order to get the data related to the audience, like gender, age, economic background, and English skills. The output of this process is students' profile. 2) Needs analysis: the goal of this step is to decide the expected competency of debating training in high school. This step was conducted with strict assistance of content expert, refer to some reference books, and discussion with the coach. The output of this process is learning outcome statement. 3) Content Analysis: based on the designed learning outcomes, we select related content to support the learning outcomes achievement. The content was divided into three main topics, there are; Introduction, Preparation, and On the Debate.

After the direction was setted, the hypermedia then go on the next development step, it is *design*: The next

phase of development process is to design the product specification encompass simplicity and complexity aspects of this hypermedia product. At the end, product will be produced based on designed specification. First thing first on production phase is developing content map and storyboard as the guideline on product development. Based on the storyboard, the developer will analyse the needs of supporting resources such as image, multimedia, and other resources in order to develop the product. The result of this design phase is the prototype of hypermedia product as self-regulated learning resources in high school debating training.

After pass the design process, the hypermedia product ready to be tested to ensure the feasibility in *accountability* step. In this phase the hypermedia product was evaluated and measured. There are six aspect to be assessed on this phase; (1) Interface, (2) navigation, (3) interactivity, (4) supported media, (5) content, and (6) learning activity. Interface aspect focus on assessing the user interface design aspect to make the hypermedia more attractive and functional for users. Navigation aspect focus on assessing the component were enough to guide student on learning, keep student on the right learning track, and avoid confusion on learning in hypermedia systems. Interactivity aspect focus on assessing the hypermedia systems in maintaining the interactivity between students and learning resources to support the self-regulated learning process. Supported media aspect focus on assessing all supported media in hypermedia system were functional and support the achievement of learning outcomes. Content aspect focus on assessing the conceptual correctness of delivered content in hypermedia system and the appropriateness load of the content. Learning Activity aspect focus on assessing the hypermedia systems support the needs of self-regulated learning, including the independency and accessibility aspect as learning resources.

Table 1. Assessment Criteria

Aspect	Component
Interface	Layout
	Colour
	Font Style
Navigation	Link
	Button
	User Guide
	Concept Map
	Glossary
Interactivity	Respond
	Stimulus
	Flexibility
Supported Media	Quality of video
	Relation of video to content
	Relation of animation to content
	Relation of still picture to content
	Attractiveness of supported media
Content	Effectivity
	Compatibility
	Test Assessment
	Language
	Content load
	Bias
	Sequence
Learning Activity	Attractiveness
	Motivation
	Independency
	Accessibility
	Availability of Facilitation

The six aspects were assessed and evaluated through formative evaluation that consist of three evaluation steps; (1) expert review; (2) small group evaluation; (3) field test (Pappas, 2016). On the expert review process, prototype was reviewed by media expert, content expert, and instructional designer expert to get input that ensure prototype product already meets the standard on media development principle, content, and instructional design principle. The hypermedia product was improved based on the inputs from experts in expert reviews phase. After first revision, revised prototype product tested on 5 samples from senior members on English Debating club (small group evaluation). The samples gave testimonial comment on prepared questioner related their experience on using this hypermedia product. Some inputs focus on the user interface aspect, related to some technical problems on playing the medias or unworked hyperlink. All of the inputs was followed up in the second revision process to ensure the user can use the hypermedia product with less barriers.

The last phase in formative evaluation process is field test where the product was used in real learning condition with real user. In this experiment, field test was conducted to English debating training 51 Vocational Highschool Jakarta. The product was tested on 3 months training program using the “Enjoy Your Debate!” hypermedia product as self-regulated learning resources. At the end of the training program, students were asked to fill the product assessment survey. Same with the previous phase survey, survey in the field test was also focus on 6 aspect in hypermedia product, (1) Interface, (2) navigation, (3) interactivity, (4) supported media, (5) content, and (6) learning activity.

Besides the formative evaluation, experiment also conduct readability test using Gunning Fox Index formula. Fog Index usually used to assess readability of content based on the reader level (Bastable, 2011). Readability level was calculated based on average of the number of words per sentence, and the number of long words per word. An interpretation is that the text can be understood by someone who left full-time education at a later age than the index.

Table 2. Reading Level Index

Fog Index	Reading level by grade
17	College graduate
16	College senior
15	College junior
14	College sophomore
13	College freshman
12	High school senior
11	High school junior
10	High school sophomore
9	High school freshman
8	Eighth grade
7	Seventh grade
6	Sixth grade

To ensure the effectivity of hypermedia product on supporting English Debating Training, the product shall meet the three criterias of effective product based on Web-based Learning Environment development model; (1) the high frequency of use; (2) the improvement of knowledge; (3) the improvement of skills. On this research, the high frequency of product usage refer to the frequency of student on using “Enjoy Your Debate!” hypermedia product as self-regulated learning resources. Meanwhile, the improvement of knowledge criteria on this research was referred to the mastery of English debating knowledge that support the achievement of expected learning outcomes. As for the improvement of skills also refere students achievement of expected learning outcomes.

The frequency of product usage data was collect through survey during a month of debating training using “Enjoy Your Debate” hypermedia product. Meanwhile, to ensure the improvement of students’ debating knowledge, we conduct pre-test and post test, and compare the result to analyze the significancy. As to assess the debating performance, we conduct competency assessment based on 10 performance indicator of expexted learning outcomes. Students were assessed by debating coach using checklist instrument.

RESULT AND DISCUSSION

The hypermedia product “Enjoy Your Debate!” was tested on real setting and assessed based on the assessment criteria through field test evaluation. Overall, the product was passed the proper test with score average 3,58 out of 4. The highest scored component is Navigation component with total average score 3,67, it shows that the hypermedia product will prevent the lost direction issues that often happen while learning with hypermedia. As for Interface component, the hypermedia product was assessed to be very good with total average 3,63 shows that the interface will support students on comprehend the content. The hypermedia product was assessed to have good interactivity with total average 3,64, since the product was designed to give supported feedback to students and also have flexibility to facilitate the different learning styles and learning paces of students. All of those aspects support the self-regulated learning activity facilitated by the hypermedia product, as the Learning Activity also got very good result, 3,57 point, it shows the student were motivated by the self-regulated learning activity through “Enjoy Your Debate!” hypermedia product. The product assessment result show that user satisfied with the product to support self-regulated learning activity.

Meanwhile, based on the survey of product usage frequency, the result of this interview shows that 80% of students often use this hypermedia at their home and as resources during the training, 10% use it immensely often, and 10% use it rarely. Based on that data, it can be conclude that the students product usage frequency was high. As for the improvement of students’ debating knowledge, the pre-test and post-test were conduct. At the beginning of the training program, the pre-test instrument was given to the students and the average result is 5 out of 10. After ± 3 months of training program using hypermedia as learning resources, the post-test was conducted with the same students and same questions with the average result 7.3 out of 10. Based on the test result analysis, there are improvement of students’ debating knowledge which indicated by the improvement test result by 3.3 point.

The students also achieve the expected competency as shown on performance assessment result. Students were assessed by debating coach using checklist instrument. The following graphic (Figure 1) will show the performance assessment result:

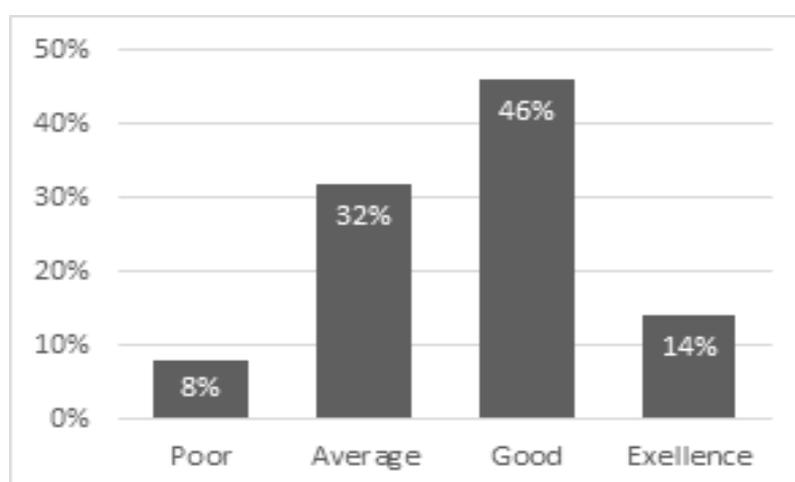


Figure 1. Performance Assessment Result

The data show that 46% persen of student achieve good performance, and 14% of student achieve excellence performance. It is indicate than 50% of the students have above average debating skills after learning with hypermedia “Enjoy Your Debate!”. Therefore most of the students could achieve the performance indicators. Based on these findings, the hypermedia product was proven on helping students to achieve debate competencies.

For the readability test, the Gunning Fox Index formula was applied to sample paragraph on page 16 Enjoy Your Debate hypermedia. On that paragraph, there are 92 words, 10 sentences, and 7 difficult words, and the score of Gunning Fox Index measurement is 6,7. The measurement score then mapped into readability level index, score 6,7 was indicated that the text on sample paragraph is easy to be read for high school students. It is important to ensure the text are appropriate for the targeted user because it will help the content comprehension that will be assessed on the pre-test and post test to ensure the debating knowledge after the training using hypermedia “Enjoy Your Debate!”.

The result shows that hypermedia can be one of effective learning resources in self-regulated learning setting. It was found that (1) students motivate to use hypermedia as learning resources in self-regulated learning in English Debating Training that shown by the high usage frequency both between and outside the debating class; (2) there are increase debating knowledge comprehension that supported by the use of hypermedia “Enjoy Your Debate!” that indicate the content was delivered effectively to students; (3) the debating skills was improve at the end of the debating training using hypermedia as self-regulated learning resources that indicate the “Enjoy Your Debate!” hypermedia could assisst students on mastering the expected debating skills.

In line with previous research on the use of hypermedia in self-regulated learning, we assumed (1) that students who learned with hypermedia become more active and motivate to set their own learning path; (2) the interactive components on hypermedia is important to enhance students engagement on the learning which it is important on self-regulated learning; 3) the braching access that become one of hypermedia characteristics also help students on set their own learning path and pace for students with various learning style; (4) the multimedia and non-linier sequence components on hypemedia was help student on adapting the self-regulated learning environment since students can easily chose the type of media that suits the best for them and can easily chose the learning topics based on their needs.

The results are consistent with previous studies that shows hypermedia can be effective to stimulate students on develop their self-regulation strategies on a more elaborated level of processing. This metacognition skills has been understood might have led to focus on information that was relevant mainly for the successful completion of the learning (Müller & Seufert, 2018; Yamat, Ismail, & Shah, 2012).

CONCLUSION

Enjoy Your Debate, is a learning resource in hypermedia form and electronic self-regulated learning resources for English debating training in high school. The product was developed within development model Web-Based Learning Environment by Hall, Watkins, & Eller framework. With its flexible systems and supported by interactive multimedia, Enjoy Your Debate hypermedia could increase the effectiveness of debating training in high school. Students use this product as their self-regulated learning resource before and during the debating training. Based on the data from the field, it can be concluded that using this Enjoy Your Debate hypermedia can also increase the debating knowledge of students and also help students to achieve the debating competencies.

Based on the observation during three months debating training using Enjoy Your Debate hypermedia as learning resources, it can be concluded the strenghts of this product are: (1) Can be used as stand alone resources in self-regulated learning, but also available to use as supporting media of trainer in face-to-face conventional learning; (2) The simple and interactive language help students easily understand the content although the content was delivered on foreign language; (3) The navigations are help student to set their own learning path and learning pace and decrease the lossing track possibility; (4) The hypermedia containt self-assignment that help student to practice their skills independently, assessment to control the student comprehension, and evaluation to help students on measuring their comprehension; (5) Enjoy Your Debate Hypermedia was designed with good instructional design that support students on learning in self-regulated learning environment.

Enjoy Your Debate hypermedia still has some weaknesses, such as: (1) Additional application (plug in) need to be installed before using this product, this condition however inhibits user to use the hypermedia as it add the efforts for user; (2) Need additional skills to operate computer; however during research we don't find any challenge from students on using the computer; (3) Not optimal to be used on face to face learning, because this learning resources are not designed as class projected media. Considering the weakness of this hypermedia product, we suggest the further research on developing hypermedia that lighter to be operated both cloud (mobile or web based-application) and offline (on the desktop).

We suggest the use of hypermedia for self-regulated learning consider its flexibility and modularity on support students with various learning style. However, it is important to have good instructional design on developing the hypermedia, because to support self-regulated learning, the hypermedia shall be able to facilitate learning on it own. It is also important to give navigation and content map on the hypermedia to avoid confussion on learning with hypermedia, because students also on improving process to develop their metacognitive skills to support self-regulated learning. Therefore, we also suggenst the research on developing framework model on designing self-regulated learning with hypermedia since we think it will be easier for the developer, instructor, and instructional designer on designing hypermedia in self-regulated learning with specific framework model.

Considering the findings on this study, hypermedia could be considered as new alternative resources for training program or other self-regulated learning activity, considering its high flexibility and interactivity. Furthermore, the promising potency of information and communication technology need to be studied more, since there are some strengths and weaknesses on its implementation in learning.

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