

COLLABORATIVE LEARNING FOR CHILDREN WITH SPECIAL NEEDS THROUGH COMPUTER SUPPORTED COLLABORATIVE LEARNING AT VOCATIONAL HIGH SCHOOLS

Hendra Jaya, Sapto Haryoko, Lu'mu

Universitas Negeri Makassar
E-mail: hendra070982@gmail.com

ABSTRACT

The objectives of this study were to determine how to apply collaborative learning model through a Computer Supported Collaborative Learning (CSCL) approach for disabled students in vocational schools. The CSCL learning model is a combination of cooperative learning model and the use of computers and the internet as a medium in learning. With increasingly sophisticated technology, individuals in remote locations make it possible to collaborate on-line. Research in the field of Computer Supported Collaborative Learning or commonly referred as CSCL, provides a new experience that Websites is one model that can be used to improve collaboration in learning. Its use in improving collaboration in learning provides an insight that Websites are effectively applicable when it is integrated into learning. As in this study, it was concluded that Collaboration between lecturers and students in using websites provided a good relationship to the improvement of collaboration between lecturers and students. Utilization of this websites made it easy for lecturers and students to share information and interact either in personal or in groups and general. Collaboration activities were not only conducted in the campus environment but anytime and anywhere. The effectiveness and efficiency of using websites as CSCL media with some indicators obtained the assessment of very effective and very good.

Keywords: collaborative learning, websites, disabled students

INTRODUCTION

The central government requires all schools to implement the zonation system in holding the New Student Acceptance (PPDB) for the academic year of 2017/2018. The provincial government oversees the PPDB for senior high schools or vocational high schools level, while the district government oversees the implementation at the level of primary or junior high schools equivalent. Zoning system has been designed since 2016 and has been applied in Makassar. Schools are required to accept all prospective students who are domiciled in one area with the school. The main requirement of the zoning system is the distance of the students' residence to the school. Other factors are just additional requirements, including the students' scores of National Examination.

Based on the observation and needs analysis in 2016 at SMKN 1 South Sulawesi, it was obtained several obstacles in the implementation of this new admission. One of

them was the quality of students who would be accepted is not known, so various backgrounds of children were accommodated for an example there was a child with special needs who also participated and was accepted whereas he should go to extraordinary schools for disabled people. These diverse characteristics of the students require teachers to apply effective learning thus the lessons can be absorbed by the students in SMK. One alternative is the use of computer media to attract students' interest and attention.

The use of computers as part of technology is also increasingly widespread and has penetrated the world of education. Computers in the world of education in Vocational High Schools is not only used as a medium of learning in the classroom that helps the teacher in presenting the lesson materials. Computers can function more as a medium of learning for students. Computer function in learning at the beginning of its development is classified into two things, namely computer assisted instruction (CAI) and computer

managed instruction (CMI). But along with the increasing needs of computer use in learning, then the computer functions are expanded into three classifications, namely: management functions, learning functions and action research functions. Management functions of computers are intended to arrange schools' budgeting, accounting, record keeping system, electronic communications, printing and information retrieval. Meanwhile, the learning function is divided into two, namely teacher-centered learning and student-centered learning. Action research functions include data storage applications and statistical analysis that assist teachers in processing learning outcomes (Eri Satria, 2009).

The learning process generally emphasizes the importance of cooperation rather than competition and interdependence rather than independence (Sudarman, 2008). If competition is developed, then the tendency to thoughts and feelings of not reluctant to attack others will appear. On the other hand, the development of cooperation and interdependence can develop the ability to face the challenges, leadership, and management that are urgently needed if they already Center the workforce. Collaborative Learning (CL) is a structured and systematic instructional strategy whereby a group of learners work together to maximize the learning of their peers (Wu Junqi, 2009). Collaborative learning prompts the students to perform better achievement (Rahdiyanta, 2017). The forms of CL can be dialogues, negotiation, and arguments to solve problems. The emergence of collaborative learning stems from a philosophical perspective on the concept of learning. To be able to learn, one must have a partner. Collaborative learning can provide opportunities to lead to successful learning practices. As a technology for learning, collaborative learning involves the active participation of learners and minimizes differences between individuals. Rofiq et al. (2014) also concluded that the learning outcomes of independent students who were treated with the collaborative model were

higher than those who were treated with the direct model.

One method of applying collaborative learning is Computer supported collaborative learning (CSCL) in which a group of learners are in a computer network in order to maximize individual, team, and learning outcomes to achieve goals through useful discussions and assistance (Xinyu D., Li Min, 2008). CSCL learning model viewed from the psychology of education is included in constructivism understanding, that is students build their own knowledge. Students can learn independently or in groups, form a communication network and interact with members of the group. Students' interactions are not limited to the time, school, city, and even countries that become obstacles of distance learning so far. Although it is something new that may still be many obstacles but it is believed that in the future the distance learning model will grow rapidly along with the development of technology and the development of learning method (Eri Satria, 2009).

CSCL learning model is allegedly able to form self-reliance and sense of responsibility of learning, increase motivation to learn, form metacognition ability and critical thinking ability in problem solving. Learning models have broader meanings than learning strategies, methods or procedures. The term instructional model has four distinctive features that are not shared by learning strategies or learning methods including: (1) The logical theoretical rationale developed by the educator; (2) Learning objectives to be achieved; (3) Teaching steps needed for the learning model to be implemented optimally; (4) The learning environment needed for learning objectives to be achieved.

Collaborative methods are based on assumptions about the learning process of learners as follows (Semiawan, 1992): (1) Learning is active and constructive. To learn the lesson material, learners should be actively involved with the material. Learners need to integrate this new material with knowledge that

has been previously owned. Learners build meaning or create something new related to the subject matter; (2) Learning is context-dependent. Learning activities expose learners to challenging tasks or issues related to contexts that learners already know. Learners are directly involved in the completion of the task or problem solving; (3) Learners are diverse backgrounds. Learners differ in many ways, such as background, learning styles, experiences, and aspirations. These differences are acknowledged and accepted in collaborative activities, and are even required to improve the quality of achievement of shared results in the learning process; (4) Learning is social. Learning process is a process of social interaction in which learners build a shared meaning.

The rapid development of the use of computers in education and changes in the delivery of web-based materials has led to the interest of educational actors to use non-traditional learning methods in the design and delivery of materials. Collaborative learning models were tried and found successful in the 18th century by George Jardine at the University of Glasgow. He argues that teachers should change their activities in the classroom, and should give students freedom to learn from each other (Gaillet in Robert, 2005).

CSCL offers an innovation and the advantages of using computer technology in learning. Technology is seen as a way to automate learning and can save costs, without changing the viewpoint of traditional learning as the transfer of knowledge from authoritative sources to relatively passive student memories. CSCL uses media different from traditional ways to create new learning experiences for students, where students can interact with each other in a learning structure designed by teachers to create exploration and discussion situations (Stahl, 2008).

METHOD

This study was categorized as research and development. This study aimed to develop a product. It was carried out with an engineering approach where the stages were analysis, design, implementation, and evaluation. The learning model of computer supported collaborative learning (CSCL) is part of the learning function with a student-centered learning model. CSCL learning model is a combination of cooperative learning model and the use of computers and the internet as a medium in learning. With increasingly sophisticated technology, individuals in remote locations make it possible to collaborate online. The multimedia development used in this research referred to the design by Lee & Owens (2004: 161). The research design is presented in Figure 1. The development consisted of 5 stages: (1) Analysis, (2) Design, (3) Development, (4) Implementation, and (5) Evaluation.

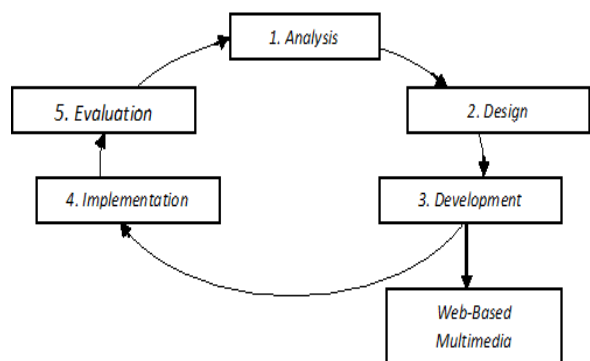


Figure 1. Research Design
(Lee & Owens, 2004: 161)

The initial phase is to validate the product to material experts, media experts, visual communication experts, and programming experts. Initial product validation is carried out in an integrated manner from the device generated in the design until the product

of the collaborative learning model is obtained. The collaborative learning model is presented in Figure 2.

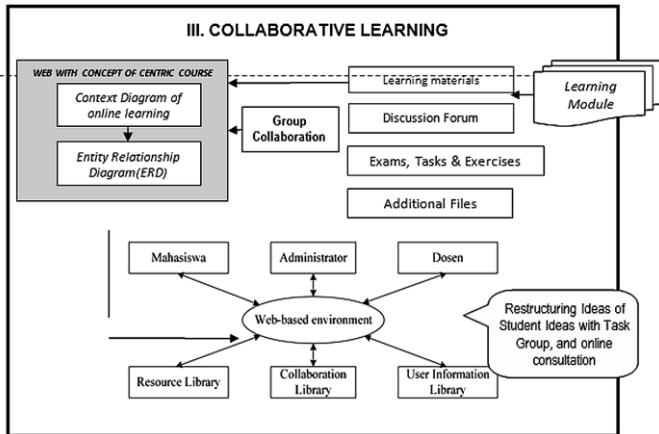


Figure 2. Collaborative Learning Model

RESULTS AND DISCUSSION

After performing needs analysis and literature studies, the next step was to develop the features of the learning model with the existing CSCL approach in accordance with the needs analysis. The website used in this study was developed using www.blogger.com. It was used as a teaching medium as a complement that can be accessed by students anytime and anywhere via internet. In making the website as a medium of learning there were several stages that consisted of installation of the website on hosting, integrating internet messenger, flickr, slideshare, youtube or google video and others. This integration was aimed to facilitate communication, to exchange links and to clarify learning materials with images, animations, videos and others.

After completing the installation and the registration, it will appear the front page with original theme, the front page appearance can be modified in accordance with the features and needs of Digital Learning and the needs of disabled children. The website view is presented in Figure 3.



Figure 3. Display Websites after Modified for Disabled children

Figure 3 shows a general overview of the course of Digital Electronics. Next to the bottom of the Page, there are several icons with their respective functions which are presented in Table 1.

Table 1. Icon and Functions

No	Icon	Function
1		Enter the Practicum Menu
2		Enter the Basic Theory Page
3		Enter the Simulation Page
4		Enter the Page to assemble components, put the component in accordance with its symbol
5		Enter the Jobsheet Page. Students can carry out practicum based on the worksheet that has been made

The pages of Practical Menu, Practicum Page, Basic Theory and Simulation are presented in Figure 4 to Figure 7.

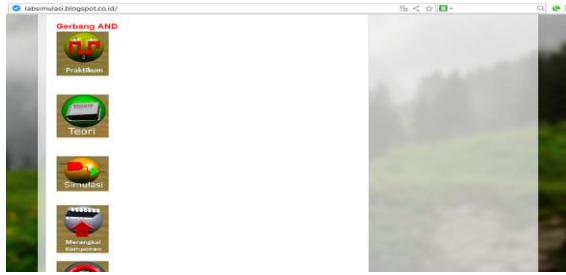


Figure 4. Practical Menu

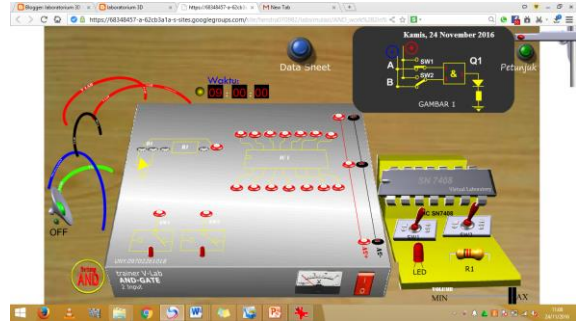


Figure 8. Installing Components

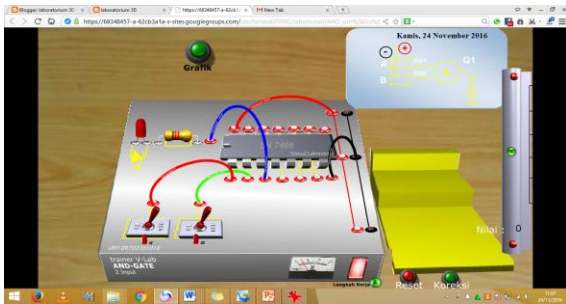


Figure 5. Practicum Page

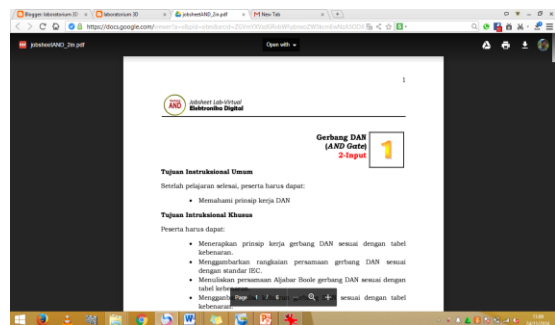


Figure 9. Jobsheet



Figure 6. Basic Theory

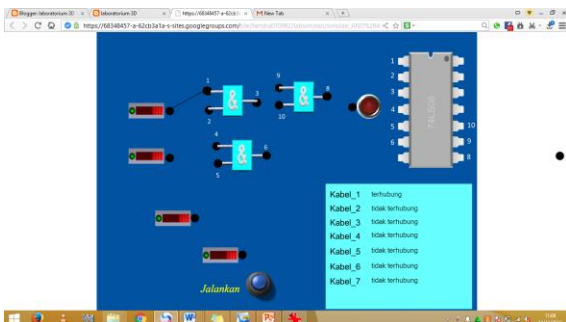


Figure 7. Simulation

The students can simulate the circuit in the practicum page. They can connect every point on digital symbols. If the relationship between the black dots is correct or right then the text on the bottom right will provide information on whether the cable 1 is connected or not-connected.

A collaborative learning assessment involves lecturers of Digital Electronics courses and media learning experts. The assessment process by the expert of learning media and lecturer of Digital Electronics is done by expert judgment. The detailed assessment results by media expert and material expert is presented in Table 2. The results of the assessment by the expert of the learning media through the expert judgment process showed good values especially aspects and features of visual design, completeness of information, ease of searching the website, tasks, reference list or reading material, websites profile, materials presentation, animation, videos and pictures. There are discussion forums, announcement boards that provide information, tools for sharing files and means of group discussion and access speed. In other aspects and features such as assessment, reference sources, the results of the assessment indicates sufficient values. Since the website evaluations shows the values were mostly categorized as good, then the website can be tested to students with special needs.

Table 2. Assessment by Media Experts and Material Experts

No	Statement	Average Score
A	Display and Lay out	
1	Proportional layout cover / front cover for children with special needs	4.5
2	Conformity of color proportion for children with special needs	4.5
3	Display images (selection of images according to the needs of children with special needs)	4.5
4	Selection of font types (type of letters and numbers according to the needs of children with special needs)	4
5	Clarity module title	5
6	The suitability of font size selection (letter size and number according to the needs of children with special needs)	5
7	Interesting website design	4.5
8	Display size of the website	5
9	Synchronization between graphic, visual and verbal illustrations	4
	Average Score	4.56
B	Strategies of Learning	
1	Clarity of instructional guidance (instructions for use according to the needs of children with special needs)	5
2	Clarity of goal / competence formulation	4.5
3	Ease of preparation for learning	4
4	Accurate application of learning strategies	4.5
5	Linkage with other modules	4
6	Completeness of the introductory component	5
	Average Score	4.50
C	Usability	
1	Ease of use	5
2	Easy to interact	4.5
3	Ease of search	5
4	The clarity and suitability of the language used (communicative language)	4.5
5	Examples and illustrations to clarify materials understanding	4
6	Up to date / Contextual material	5
7	Has appeal with colors, pictures / illustrations, letters (bold, italic, underline, etc.)	4
D	Evaluation	
1	Clarity of workmanship / test instructions	5
2	Problems Raids are Presented	4
3	Degree of problem / test	4
4	Balance the proportion of practice / test questions with the content of the material	9
5	The accuracy of giving feedback on user answers	5
6	Clarity of evaluation in providing problem solving	4.5
7	The likelihood of the self-assessment	4.5
8	Answer key	4.5
E	Design	
1	Websites are designed for collaboration purposes	4.5
2	Website-based learning creates a conducive learning environment for collaborative learning.	4.5
3	This lesson emphasizes student interaction between students and between students and lecturers	4.5
4	Learning activities with the aim to avoid boredom and saturation so that learning can be effective and efficient	4
5	A meaningful process of learning	4
	Average Total Score	4.3

In the field trial to test the effectiveness of the products it was distributed questionnaires to 5 observers. To determine the effectiveness and the practicality of the model, the assessment by experts and practitioners based on the mastery of theories and experience was conducted. The results of the assessment are presented in Table 3.

Table 3. The effectiveness of the product

The Component's Evaluation	Average Score	Category
Indicators		
1. Improved performance (competence of students with physical disorder)	4.2	good
2. Disabled students exhibit increased collaborative practices	4.8	Very Good
3. Improved performance of students with disabilities for material completion	4.8	Very Good
4. Direct response of disabled students to feedback questions in group discussions	4.6	Very Good
5. Asking direct questions or responses by raising hands	4.4	Good
Average Total Score	4.56	Very Good

Furthermore, to examine the practical requirements of the product, it was performed an assessment of several indicators as presented in Table 4. The results revealed that the average score of all aspects was 4.9 categorized as very good. Indicators that stated practicality are spelled out with four indicators as follows: Firstly, the statement of respondents can implement and complete the experiment objectively according to the flow and the procedure in the websites was obtained the average score of 4.8 categorized as very good. This is very practical when it is compared to the practicum in a conventional laboratory in which one appliance is used by 4 to 5 students thus the completion of the practicum does not work objectively because only one student do the tasks and the other students just watch it. In

addition, in the conventional laboratory, only the intelligent students can practice well. Secondly, the statement of teachers can directly do the assessment and the scoring of students' practicum results stored in the website data base was obtained the average score of 5 categorized as very good. In other hand, in the conventional laboratory, the teachers should observe the students one by one with thoroughly during the process of practicum. Thirdly, the statement of the data stored in the website can be directly accessed by students to do the practicum was obtained a score of 5 with a very good category. The statement of learning process needs are accommodated in the website including tools and materials, measuring instruments, and the data sheet book was obtained the average score of 4.8 categorized as very good.

Table 4. The Practicality of the Product

Indicators	Average Score	Category
1. Disabled students can carry out and complete the collaborative practices according to the flow and procedure in CSCL (Computer Supported Collaborative Learning)	4.8	Very Good
2. Teachers can directly conduct the assessment and the scoring of the results of the practicum stored in the website	5	Very Good
3. Websites can be directly accessed by students to do practicum	5	Very Good
4. All that is required in the Website has been provided including tools and materials, measuring instruments, and data sheet books	4.8	Very Good
Average Total Score	4.9	Very Good

The learning model of Computer Supported Collaborative Learning (CSCL) is part of the learning function with a student-centered learning model. CSCL learning model is a combination of cooperative learning model

and the use of computers and the internet as a medium in learning. With increasingly sophisticated technology, individuals in remote locations make it possible to collaborate on-line. The web-based on-line learning model can be utilized by the teachers effectively as in the assessment results presented in Table 5.10, it is found that the assessment of the effectiveness of this web-based media is 4.56 categorized as very good.

The different frameworks held by instructional, socialist, constructivist and collaborative learning by computer and non-computer use provides the basis for designing the necessary needs in collaborative learning. In contrast, in pedagogic learning, the media become important in the aspect of communicating. In collaborative learning, communication aspects can include access to information, ask questions, understand concepts, formulate goals, repetition of exercises, reflections, discussions, debates, articulations and documentation of ideas submitted. Within the CSCL learning framework, traditional tools such as whiteboards or classrooms are not a major requirement in collaborative learning. The CSCL model emphasizes the use of computer technology as learning media to enhance the learning experience for students with disability.

CONCLUSION

Research in the field of Computer Supported Collaborative Learning or commonly referred to as CSCL, provides new insight that website integrated into the learning process is a learning model that can be used to improve the collaboration of disabled students in vocational high schools. Utilizing websites provides a good link to increase collaboration between teachers and students. It also makes it easy for teachers and students to share information and to interact either in personal or in groups. Collaboration activities not only occur in the school environment but they can be conducted anytime and anywhere. Collaboration between

students and students in utilizing websites provides a good link to increased collaboration between students and students. It makes it easy for students to coordinate with other students or to do study groups. They also find it easier to share informatif, to communicate and to provide feedback on what their peers are working on. In addition, the students can reconstruct their learning results. The effectiveness and the efficiency of websites usage as CSCL media were assessed as very effective and very good.

REFERENCES

- Dwi Rahdiyanta, Putut Hargiyarto & Asnawi. 2017. Characters-Based Collaborative Learning Model: Its Impacts on Students' Attitude and Achievement. *Jurnal Pendidikan Teknologi dan Kejuruan*. 23. 3, 227-234
- Eri Satria. 2009. Model Pembelajaran Computer Support Collaborative Learning (CSCL). *Seminar Nasional Matematika dan Pendidikan Matematika Jurusan Pendidikan Matematika FMIPA UNY.PROSIDING* ISBN:978-979-16353-3-2
- Laurillard, D. 2008. The Pedagogical Challenges to Collaborative Technologies. *Journal Computer-Support Collaborative Learning*.4, 5-20
- Robert, T. S. 2005. *Computer-Supported Collaborative Learning in Higher Education*. United State: Idea Grup Publishing
- Stahl. G. 2008. Yes We Can!. *Journal Computer - Support Collaborative Learning*. 4, 1-4
- Semiawan, Conny. 1992. *Pendidikan Keterampilan Proses*. Jakarta: Grasindo

- Sudarman. 2008. Penerapan Metode Collaborative Learning untuk Meningkatkan Materi Mata Kuliah Metodologi Penelitian. *Jurnal Pendidikan Inovatif*. 3. 2, 94-100
- Wu Junqi, et. al.. 2009. Design of Collaborative Learning in Cyber-schools. *First International Workshop on Database Technology and Applications*, 978-0-7695-3604-0/09, 703-706
- Zainur Rofiq, Urip Widodo & Dandhi Fajartanni. 2014. Pengembangan Model Pembelajaran Kolaboratif untuk Peningkatan Hasil Belajar Gambar Teknik di Sekolah Menengah Kejuruan. *Jurnal Pendidikan Teknologi dan Kejuruan*. 22. 2, 235-240