The Development of Flipped Classroom Learning Model to Improve Students' HOTS in Covid 19 Pandemic Era

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Abstract. The study aims to identify the stages of development of Flipped Classroom (FC) model, which can improve students' HOTS and the validity and practicality of the model. The research subjects were all 10th-grade students following the Crafts and Entrepreneurship subject and the subject's teacher. Data were collected through Focus Group Discussion (FGD), interviews, questionnaire, checklist, and scale and analyzed descriptively. The research findings show that the Crafts and Entrepreneurship subject was taught with conventional method which more dominantly involved teacher rather than students from defining stage like front end analysis, students' analysis, task analysis, and learning goal specification analysis. The stages show that students' ability was low, including receiving the learning material and doing the final task, which further implied their HOTS. However, their academic skill was probably relatively good. Then, the review showed that learning media was valid, effective, and practical. The findings were categorized as valid since experts performed the validation, and the trial results show a validity level of 3.16. This study found that the learning material for the FC model was practical. The practical material was developed by implementing the input we obtained from the trial using a questionnaire to gather data about the perception of three Crafts and Entrepreneurship subject teachers and 33 students following the subject using the FC learning model and media.

Keywords: Development, *Flipped Classroom*, HOTS

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INTRODUCTION

The Minister of Education and Culture, frequently mentions that GPA and score rank at school do not guarantee someone to be successful. GPA and rank only measure the hard skill, not the personal and interpersonal skills referred to as soft skills. However, some experts believe that hard and soft skills are important and support each other to succeed. One of the learning models combining the two aspects is Flipped Classroom. The model is also called reversed learning because the activities begin at home while traditional learning starts the activities at school. In traditional learning, students receive materials through teacher talk or group discussion and do homework that should be submitted the following day/week. However, in flipped classroom learning, teachers send video material to students at home, and they should make a summary and note important points. Then, the learning material from the video is discussed in the classroom the next day. (Arends, R.I, 2015; Jdaitawi, M., 2019).

According to Nederveld, A & Berge (2015), the activities carried out in the classroom in the traditional method are carried out at home in the Flipped Classroom model, while the activities traditionally performed at home (homework) are completed in the classroom. Based on that description, the FC learning model should be developed through research because the model is relevant to be applied in improving students' creative and innovative thinking to support the program of Merdeka Belajar Kampus Merdeka (MBKM). It had been identified that the Crafts and Entrepreneurship subject was carried out traditionally while this subject was supposed to be conducted using the FC model because it is important to prepare students with the basic skill to grow their innovation and creativity. Through this lecturer's independent research, students were expected to build their critical thinking, which was in line with HOTS.

Although this is a new learning model, there have been a number of studies investigating the FC model like Sohrabi, B & Iraj H (2016) entitled *Implementing Flipped Classroom Using Digital Media*; this research focused on the implementational of FC based on digital media. Besides that, Eppard J & Rochdi A (2017) entitled *A Framework For Flipped Learning*. This research discussed the framework and stages of FC learning. Then, another study was carried out by Agustiningrum, A., & Haryono (2017) under the title The Implementation of Flipped Classroom Learning Model and Lesson Study based Horay Course Review to Improve the Students' learning Activities and Outcomes. It generally discusses the influences of FC learning on students' learning activities and outcomes.

Some earlier studies as described above can guide us with the position standing of FC in the present study. Those earlier studies and the present one have a similarity in their discussion topic, FC. However, the current study focused on the efforts to improve students' HOTS in the Covid 19 pandemic era, which needs soft skills. Thus, the novelty of this research lies in its urgency. FC is a new learning model found in the middle of communication and information revolution civilization called era 4.0. It is because the learning model instrument depends on network technology like video, one of the artificial intelligence which characterizes post-modern societies.

The learning model is considered an innovation because it has not existed before. The basis of the learning is at home, not at school, so it is called reversed or flipped classroom teaching. To further understand this model, it is highly suggested to understand traditional learning first (Eppard J & Rochdi A, 2017). It has been known that in traditional learning, students receive material through teacher talk, group discussion, and homework. Unlike the flipped classroom, students receive learning material at home using learning media like video, making summaries and notes for important points, making questions, sharing and discussing with friends online, or reading necessary resources. Besides completing tasks at home, they will also follow some activities at school like discussion, laboratory experiments, and explanations of concepts they have not understood. Those agendas support activities to help students deepen the materials they have learned at home.

Bergman, J. & Sams, A. (2017), in their book "*Flip Your Classroom: Reach Every Student in Every Class Everyday,"* wrote that in implementing flipped classroom, there are many activities to perform, like starting the classroom by discussing the video they have watched at their home. However, the weakness of this learning method is that the students cannot directly ask a question that comes up in their minds. This problem can be anticipated by various activities like at the beginning of the semester; students are trained to watch videos effectively. Then, they are instructed to turn off their cellphone and put away other possible disturbances while watching. Thus, students have the ability to reduce teachers' burden. Students can freely use the pause button and write important points from the material. Besides that, students are also taught Cornell note-taking method. They note important points, write down questions they made by themselves, and summarize the material they have learned.

Related to covid 19 pandemic, to achieve the learning target, students need high-order thinking skills. Therefore, students should not only be able to understand, but they should also be able to discover information by themselves. Furthermore, high-order thinking skill is not an ordinary level of thinking. Someone has to find out the truth. They should not only memorize facts and pass them to others. Sani and Ridwan Abdullah (2019) defined HOTS as thinking widely to find new challenges, implementing new information or prior knowledge, and manipulating the information to obtain possible answers to a new situation.

HOTS requires someone to manipulate information and ideas to produce new meaning and implications (Siti Zubaidah, 2017; Cooper, J. M. (2010). Then, Kuntari Eri Murti(2018) stated that high order thinking skill is to think critically, innovatively, and creatively guided by the idea of truth, which has meaning. Critical and creative thinking depend on each other as values, reasoning, and emotional criteria. Siti Zubaidah mentioned a similar point (2018), David, J., Paul, E., & Donald, K. (1989) that HOTS is not only memorizing verbally but also understanding the nature of something. Therefore, it needs integralistical thinking, including analysis, synthesis, association, and conclusion, to create innovative, creative, and productive ideas.

Based on some statements presented above, it can be concluded that HOTS aims not only to understand but also to describe, analyze, and predict. Thus, HOTS can make students intelligent, independent, and solutive. Furthermore, Bloom B. S. (1956) divided the learning taxonomy into six categories: *knowledge*, b. *comprehension*, c. *application*, d. analysis, e. Synthesis, and f. Evaluation. Students' understanding levels are ranked from the lowest (C1): to know or to remember, to the highest (C6). After being implemented in creating instructional design for a long period, Bloom's taxonomy was reviewed by Anderson and Krathwohl. They renewed the levels to be: C1, To Know, Remember C2, To understand C3, To apply C4, To analyze C5 To synthesize, C6 To evaluate (summarized by Cooper, J. M., 2010).

RESEARCH METHOD

This study implemented the Research and Development model Thiagarajan, Semmel, and Semmel (1974). We carried out the study through four stages: defining, designing, developing, and distributing. The research subjects were all tenth-grade students following the Crafts and Entrepreneurship subject and the subject's teacher. The research site was Senior High School 1 Gowa. The subjects of expert assessors were experts judging the learning media prototype.

Data were collected through *Focus Group Discussion* (FGD) involving the school headmaster, vice headmaster (curriculum division), and Crafts and Entrepreneurship subjet teachers. The FGD aimed to gather data, including a) The understanding, response, and experience on the phenomena and problems occurring in Crafts and Entrepreneurship subject, b) Responses readiness, needs, and ideas about the development of Flipped Classroom learning model. Besides that, we also interviewed the experts to get data, information, and assessment on validating the learning model and media. The interview was also performed with the key informants (subject teachers), especially the ones involved as the trial subjects. We also conducted documentation on the school policies about the implementation of the learning, teacher activities report, or format and instrument examples. Lastly, we distributed a questionnaire, checklist, and scale to get data and information from the research subject about the concept of Flipped Classroom development to improve students' HOTS. More importantly, it was to get information about the assessment from teachers and students about the learning material's acceptance, feasibility, and effectiveness.

Data were validated and analyzed using a qualitative approach. The validation was performed by triangulating sources and methods. It was a descriptive analysis (Bogdan, R.C. & Biklen, S.K, 2015). Furthermore, the learning media development used the 4D model as follows: Defining stage. It consisted of five main steps, namely (a) front-end analysis; (b) student analysis; (c) concept analysis; (d) task analysis; and (e) formulating the learning goals. Next was the design stage. It was carried out through the following steps: 1) Creating the drafts of the FC lesson plan, model, and design, and the guide book, 2) selecting relevant references and media with the targets and goals, 3) selecting a format to investigate and understand the formats of media which had been

developed before (Thiangarajan S., Semmel D., & Semmel M. I, 1974). The last was the development stage. It was to produce the draft of the FC model and media after revising based on the experts' inputs and data on readability and trials. The limited trial was performed on the students of Senior High School 1 Gowa who followed the Crafts and Entrepreneurship subject, and the field trial was carried out in some Senior High Schools in Makassar.

FINDINGS AND DISCUSSION

Defining stage

1. Front End Analysis

Result found that some teachers applied the teacher center and teacher talk during teaching. The observation data shows that students did not fully receive a chance to be independent, creative, and innovative because when learning, they only think ordinarily, not critically and philosophically through a constructive approach.

2. Student Analysis

Using tests and questionnaires, we found that students' knowledge and skills in Crafts and Entrepreneurship subjects were low, including their HOTS which was still developing. It got a score of 63.22 out of 100. The data show that students had not optimally achieved the learning target (HOTS). The conventional learning model was estimated as the factor inhibiting students from having their HOTS developed. Some teachers in the interviews stated that the learning activities they arranged were in one direction as they thought it was the best. They were unfamiliar with the constructive learning model, which allows students to be more active and develop their HOTS.

3. Concept Analysis

The media targeted the crafts and Entrepreneurship subject to provide some basic competencies as the subject has some special characteristics differing from other subjects. Therefore, the subject teachers should be creative and innovative in choosing learning models and media relevant to the subject's characteristics. However, based on the interview with the teachers, they have not understood the subject's existence well. While the subject should be taught through a constructivism base model, teachers deliver it through conventional ways like teacher talk. The teachers dominated the classroom so that the psychomotoric domain of the students was less developed, inhibiting them from being creative and innovative.

4. Task Analysis

We gave them a test to measure students' knowledge and skill in Crafts and Entrepreneurship. The task was a real-life problem related to Crafts and Entrepreneurship to be solved through literature study or field experiment. First, they were divided into some groups and instructed to make a paper about the subject material. The second activity was to present the paper in front of the classroom. Lastly, they discussed the topic with other students, monitored by the facilitator (teacher). The activity aimed to improve students' analysis, initiative, problem-solving, and presentation skills to improve their HOTS. Based on the observation, we found that

some students had a low ability to make a paper and were less effective in discussing it with their friends. It was because they had not comprehensively understood HOTS and the concept of Crafts and Entrepreneurship.

5. Specification of The Learning Goals

The stage was performed by lengthening the activities in the classroom. Then, the activities were designed in a constructive environment to give opportunities to students to do the task in small groups. The stage involved planning, acting, monitoring, and evaluation. It aims to introduce to students how to do the planning, acting, and evaluation. In the end, it could boost students' HOTS. In the observation, we identified that students involved as the research subjects generally did not understand how to do the task like the project. It was because they had not got the skills of planning, acting, and monitoring. Based on the preliminary analysis especially points one to four, we formulated the specification of learning goals for the Crafts and Entrepreneurship subject.

Planning Stage

Based on the preliminary analysis, we formulated the basis to design the FC learning media like Flipped Classroom model, lesson plan, and module for the Crafts and Entrepreneurship subject. The development of the FC-based learning model and media produced some prototypes, including (1) the FC model, (2) the learning module / media (3) the FC lesson plan. The learning media contained the lesson plan details with the FC model and (4) Assessment instrument. Those four drafts, including the FC model, lesson plan, model of Crafts and Entrepreneurship subject, and assessment instrument, were validated by two learning experts and one material expert. It was to judge the validity and correctness and suggest improvement of the learning instrument, model, and media drafts before trial.

Development Stage

In this stage, we produced the final product of the learning model and media. The revision was made based on the suggestions from the expert validators and data from the trial session. The stages we as below:

1. Expert Validation

The learning media's format, language, cosnttruction, and content were validated. Based on the validators' suggestion, we review the learning model and media to make them valid.

Table 1. Results of Validation on the Components of Developed FC Model and Media

No	Products	Average Score from 3 Validators	Reliability price	Validity Categories	Status
a.	Design of FC learning model	4,2	94,1%	Very High	Feasible to be implemented
b.	Lesson Plan	4,0	93,0%	Very High	Feasible to be implemented
c.	Learning Model/ material	4,3	90,9%	Very High	Feasible to be implemented
e.	HOTS instrument	4,5	94,2%	Very High	Feasible to be implemented
f.	Questionnaire of teachers' perception	4,3	94,1%	Very High	Feasible to be implemented
g	Questionnaire of students' perception	4,0	88%	High	Feasible to be implemented
h	Report on the implementation of FC learning	4,0	88%	High	Feasible to be implemented

*Maximum score = 5

All FC-based learning media were feasible to implement based on three experts' validity tests. The questionnaire of students' perception and the implementation of the FC learning model show high scores, while the designs of the FC model, module, and lesson plan, HOTS instrument, and questionnaire of teachers' perception were in the very high category. The product was validated in the development stage and tested in the stage of implementation-evaluation. In this step, we performed one trial and a small group evaluation.

2. Try Out

Learning model and media which had been revised were then trialed to X grade students following Crafts and Entrepreneurship subject. Here, the students evaluated the implementation of models and media in the learning process. Data obtained from this stage were analyzed for the basis of the revision before disseminating the media and model. From the limited trial, we found that the learning media and model were valid and practical to implement in Crafts and Entrepreneurship. The practicality of the FC model and media was based on the positive responses from three teachers and students in the Crafts and Entrepreneurship class in Senior High 1 Gowa (users).

3. Practicality Test

The implementation of the FC model in the experimental class shows that each stage was implemented optimally with a percentage of 100 (highly practical). Then, observation results on the model implementation and student activeness show that students in the groups are actively involved in learning with an average score of 3.44 (high activity). The practicality criteria could also be seen from the users' perceptions. In this case, three teachers of the Crafts and Entrepreneurship subject gave positive responses (100 %) on all aspects of the FC model and media implementation in the classroom. Also, among 33 students in the experimental class, 97.64% gave positive responses. It indicated that the FC model design was practical to implement in Crafts and Entrepreneurship.

Discussion

After completing the stages of defining, designing, developing, and disseminating, we obtained some data and information as follows: 1) Crafts and Entrepreneurship subject was implemented using a conventional method which more involves teacher rather than students in defining stage like front end analysis, student analysis, task analysis, and learning goal specification analysis. Those stages show that students' ability was low, including in understanding material and completing the task, which then implied on their HOTS although their academic skill was probably relatively good. 2) We have produced valid, effective, and practical learning media. The validity was decided by the experts and trial data (high validity level). Then, we found that 3) the FC learning model and media were practical. The practicality of the FC model developed in this study was determined based on the trial-measured usinf questionnaire of three Crafts and Entrepreneurship teachers and 33 students who had followed the learning process using the FC learning model and media. The implementation of the FC model in the experimental class showed that each stage was optimally implemented at the percentage of 100 (high practicality category).

Some data and information with indicators as previously presented show that the Flipped Classroom model and media developed in this study are practical to improve the HOTS. HOTS and competencies in Crafts and Entrepreneurship should improve the basic skills to grow innovative, creative, and critical thinking. Growing this thinking method supports the HOTS. Thus, HOTS will boost not only the students' hard skills but also their soft skills, which are necessary for competition in the future (Husna Nurdinni, 2018).

To survive in life, we need strong competition competency, communication skills, and networking, which can be realized through effective learning, including implementing flipped learning. Flipped Classrooms can improve HOTS (Jdaitawi, M, 2019; Syamsidah et al., 2022). Sani and Ridwan Abdullah (2019) stated that with HOTS, students would be familiar with new challenges. They will implement new information or prior knowledge to manipulate information to get a possible answer in a new situation. Higher-order thinking skill allows someone to think creatively and innovatively because they will not only memorize facts or pass information as its original version.

HOTS requires someone to manipulate information and ideas to produce new meanings and implications (King, F.J., Goodson, L., & Rohani, 2016).

As described by Siti Zubaidah (2018), HOTS is to think meaningfully and involves creative thinking guided by meaningful ideas of truth. Besides that, HOTS stimulates someone to reason by involving their emotion so that they can think critically and creatively. HOTS leads the communication in two ways, making them depend on each other. According to Kuntari Eri Murti (2018), *Higher Order Thinking Skills* (HOTS) lead someone to think meaningfully. They will not only memorize something verbally but also seek the essence and meaning through comprehensive and analytic thinking, synthesis, association, and conclusion. As a result, creative and innovative ideas emerge.

CONCLUSION

Crafts and Entrepreneurship subject was delivered with conventional learning model which dominantly involves teacher rather than students including in defining stage like front end analysis, student analysis, task analysis, and learning goal specification analysis. Those stages indicated that students had low abilities in receiving material and doing a final task, inhibiting their HOTS improvement. The FC learning media produced in this study was valid, effective, and practical based on the expert judgment and trial data (3.16=high validity level). This study's FC learning model and media were valid and practical. The validity and practicality of the FC model developed in this study were determined based on the trial measured using a questionnaire of perception of three Crafts and Entrepreneurship teachers and 33 students who had followed the learning process using the FC learning model and media.

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