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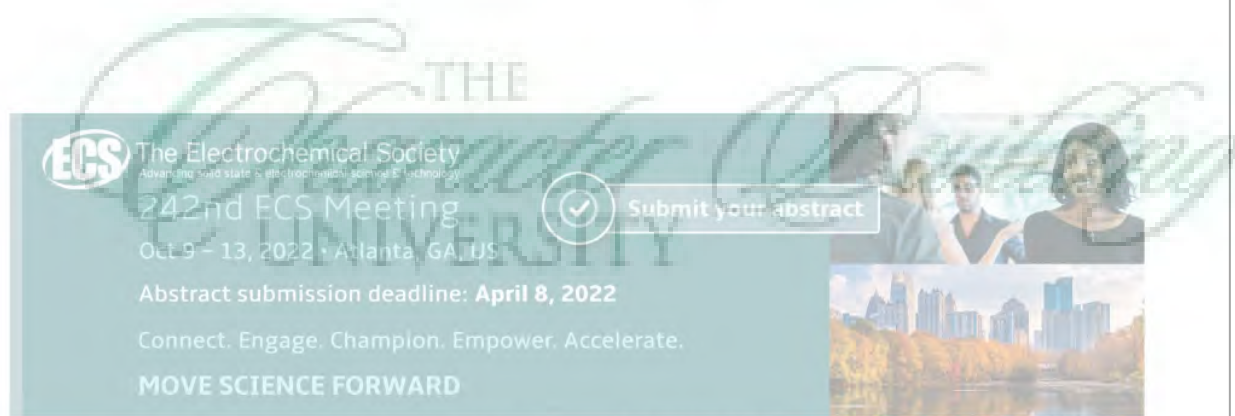To cite this article: S Frisnoiry et al 2019 J. Phys.: Conf. Ser. **1188** 012108

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The development of IT-based learning media integrated 6 tasks of the KKNI through blended learning

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Abstract. This study aims to describe validity and effectiveness of learning media products integrated IT-based 6 KKNI tasks through by Blended learning on Mathematics Department Medan State University. Development Research conducted this study. This development research was conducted to produce IT-based learning media integrated of 6 KKNI assignments. The subject of this study was 6th-semester students of Mathematics Education Study Program, and the objective of this study was mathematics learning media integrated IT-based 6 KKNI tasks in the form of a Powtoon software application through Blended learning methods. Based on the results of the analysis of the validation sheet towards IT-based learning media that is through the Powtoon application that has been given to the validator, the average value shows the number 3,64, it means that include the valid criteria. Furthermore, it was also obtained the fact that IT-based learning media developed through the PowToon application integrated 6 KKNI tasks through Blended Learning were most effective in the teaching and learning process in the Research Method course of Mathematics Department on Mathematics Education Study Program, Medan State University.

1. Introduction

The year 2018 is a digital era, where everything changes and develops rapidly because of technological and internet sophistication. It can't doubt that it will have an impact on all aspects of life; one of them is concerning work. Of course, Indonesian citizens must be able to adjust themselves to the current situation. One of the ways is to increase self-capacity to be able to compete. This developing era commonly referred to as the Industrial Revolution 4.0.

Universities as the spearhead producing graduates who will be on employment have an important role. Because of that, University is currently aggressively supporting its students to have the capabilities needed in the Industrial Revolution 4.0 era. It is expected to help graduates have jobs according to their field of expertise professionally and able to compete well. Given the future ubiquitous environment, furthermore, the collaborative learning support technologies are expected to be applied together with next-generation new media technologies such as a personalized learning environments, virtual reality technologies, ubiquitous technologies, and intelligent robots [17-19].

One of the ways that are done by University is by implementing the Indonesian National Qualifications Framework Curriculum. The government issued Presidential Regulation No. 08 of 2012 about the Indonesian National Qualifications Framework Curriculum [1]. The aim is to realize the quality and identity of the Indonesian people in the education, training and education system [2]. Medan State University is one of the Universities who has implemented the KKNI curriculum. One of

the new things in the KKNI curriculum is the implementation of 6 KKNI tasks in each course. The six task are; routine task, critical book report, critical journal/research report, idea engineering, mini research, and project. Along with the completion of the 6 tasks students are expected to read more books and journals to bring up innovative ideas and also students are encouraged to think critically and creatively to produce projects and students can better understand matters related to the world of work in the future by plunging directly into the field to complete the assigned mini research. By completing the 6 KKNI tasks regularly and continuously will print more reliable students and professional in their field, in this case, Mathematics Education.

The technology facilities provided by Medan State University are very supportive to optimize the use of technology, for example, students have used to focus on the presentation by using PowerPoint. But based on the experience of researchers during teaching, this has become commonplace. Something that was considered normal will be unattractive. Because of that, it's better to development of learning media must be carried out. The media used must be interested and according to student characteristics so that it can motivate to study more hard. The students who are taught to use animation media have high motivation than with what taught without using media [3]. Therefore, the development of learning media must be based on technology and information systems. The high results cannot be achieved in the learning and the educational process without integrating new information and communication technologies in the education system. The use of an enormous integrated set of computer and internet tools and resources allows us to achieve more efficient and effective training [4].

One of the IT-based learning media which displays many animations is a PowToon application. Powtoon is web-based animation software. Through Powtoon, an animated presentation can design which involves a basic form, cartoon forms, and certain themes. Presentations using Powtoon software can be added with background sound, music, and even recording sound for specific purposes. Animation and cartoon form on Powtoon has been available with the following movements, so it doesn't take long to design the cartoon character object. A timeline controlled animation on Powtoon so the designer can easily adjust and change the appearance of the presentation. The Powtoon application can be designed as a learning media if the performance is an animation that conveys specific ideas and concepts of subject matter. This Powtoon display is in the form of the video that displays animations and sounds that can be combined. Of course, the video appearance in learning is exciting, and this can be used in teaching. The video in the middle design can be useful across different content areas and teacher education settings [5].

Besides media, Learning methods also play an essential role in improving the quality of learning. Learning methods that utilize the existence of technology, one of that are Blended Learning. Blended Learning is part of an effort to use technological progress in improving the quality of learning[6]. Rapid technological advancements influence the world of education and learning. Where learning technology has adopted and adapted cutting-edge findings in the teaching and learning process. Blended Learning combines the characteristics of traditional knowledge and electronic learning environment by combining aspects of Blended Learning such as web-based learning, video streaming, synchronous and asynchronous communication [7].

Neither in this study was conducted done by Blended Learning method which combines traditional (face-to-face) learning with network learning that utilizes the WhatsApp application. According to the results of the analysis by Eryilmaz, a significant difference between students' view about the blended learning environment as well as online and face to face learning environments. In their answers, students have expressed that they learn more effectively in a Blended learning environment [20].

WhatsApp application was chosen because it saw that all students already had Android-based mobile phones which allow the WhatsApp application. The use of this application in learning has been proven effective and able to increase motivation and independence of knowledge [8].

The final goal of this study was to describe the results of the validity of the development of IT-based learning media products in the form of using the PowToon application. And also Describing the effectiveness of integrated IT-based learning media products six the tasks of the KKNI through

Blended Learning methods which are done using the WhatsApp application in the Mathematics Department of Medan State University

2. Method

This research was Developmental Research. It was conducted to produce IT-based learning media which valid and effective. The study conducted in the odd semester 2018/2019 in the Mathematics Education Study Program Medan State University with 42 research subjects. The development model used is 4-D by Sivasailam Thiagarajan, Dorothy S. Samel, and Melvyn I Semmel with four main stages, namely defining, designing, developing and disseminate [9]. At the defining step, the researcher analyzes the needs related to students, material, learning objectives, and six tasks. Furthermore, at the design stage, researchers designed 6 KKNI assignments, learning tools, and developed media. In the developing step, the researcher validates all the drafts that have been making to the validator. Finally, after being valid at the disseminated stage, field trials are conducted. The instrument used in data collection in this study was Validation sheet, student activity observation sheet, and student response questionnaire.

3. Discussion

Based on the explanation above, this study aimed to describe the results of the validity of the development of IT-based learning media products in the form of using the PowToon application and effectiveness of integrated IT-based learning media products 6 Tasks of the KKNI through Blended Learning methods. Learning media products are developed with several stages.

3.1. Define Stage

The first stage is to define. The researcher analyzes the needs related to students, material, learning objectives. At this stage it has been determined that students still lack in insight, this can saw from the results of the situation analysis in the Mathematics Department. Where learning products in the form of learning media are still minimal, the content of the material provided is only delivered traditionally so students are less motivated to know new things related to the article. Also, new learning media have not been found that can make students more interested and motivated in learning Mathematics Research Methods subjects. From the results of the analysis, the researcher knows the needs needed to improve the quality of learning further, namely developing learning devices that integrated the KKNI curriculum and developing IT-based learning media.

Based on students' analysis that the fifth (V) semester students have been able to think high-level. It showed that they could do independent learning. Because of that, therefore, a suitable learning method is chosen, namely, Blended learning that combines traditional education with network learning. The application of the Blended Learning teaching system in knowledge was highly recommended in the current Industrial 4.0 Revolution Era. Also, six task KKNI assignments were also designed namely routine assignments, critical book reports, critical journal/research reports, idea engineering, mini research, and projects.

3.2. Design Stage

The next stage designed. At this stage, the development of learning media carried out used in the learning of Mathematics Education Research Methods subjects. The media develop the IT-based press that is, using the Powtoon application. The selection of Powtoon application media based on the wishes of researchers introducing one app that can be used as a suitable learning media, because before this application has never used in the delivery of course material especially on Mathematics Education Research Method.

Moreover, Powtoon provides various forms of cartoons from human-shaped cartoons to other objects commonly found in everyday life. The available cartoon forms also accompanied by simple animated movement choices different from other software where cartoon object movements must design for each frame, so it takes time to move. Powtoon also allows users to insert sound, music, even the user's voice which previously recorded. So many Powtoon advantages, so it is perfect to be

developed in learning Mathematics Education Research Methods. The initial design was the first draft (draft-1) which was still a prototype which validated to the expert validator.

3.3. Develop Stage

Beginning at this stage was to test draft 1 to 3 mathematics lecturers from the state field university. Validity criteria a media if the percentage is in the range of 84% to 100%. The results of media validation to the three validators can saw in table 1.

Table 1. Expert validation Results

Validator	Total Score	Percentage	Category
V_1	3,73	93,25 %	
V_2	3,53	88,25 %	Valid
V_3	3,67	91,75 %	
Average	3,64	91 %	

From table 1, it can saw that the average value obtained shows a percentage of 91%. These illustrate that the development of IT-based media is valid. After doing a little revision of the press according to expert comments, then this IT-based media is called draft-2.

3.4. Disseminate Stage

In this stage was conduct field test is to 42 students who are taking courses in Mathematics Education Research Methods in the Mathematics Department of Medan State University. The applying of Powtoon media in class is done using Blended Learning assisted by WhatsApp Application. So, learning is done in two ways, namely traditional and in the network. In this stage were conduct analysis of the effectiveness of IT-based media (Powtoon) which has been developed by looking at student activities and student responses. The application of IT-based press is the Powtoon application shows the result with the category "very high" in student activities in learning. It can be sawed from the average effect of student activity during education is 89%. Student activity values can be in table 2.

Table 2. Activity Values

Observer	Total Score	Percentage	Category
O_1	80	88 %	
O_2	81	90 %	Very High
Average		89 %	

Next, the response data obtained was 93%. These means that students provide "positive responses" to the learning media used. The results presented in the following table.

Table 3. Response Value

Total Response Score	Percentage	Category
3444	93%	Positive Response

The tables 2 and table 3, show the conclusions of the results of this test that integrated IT-based learning media products. 6 The tasks of the KKNI through the Blended Learning learning method are effective. So that by revising draft 2, draft 3 or also called "media final" is produced.

This research IT-based media with the Powtoon application adapted to lecture material at each meeting. Video Powtoon is uploaded on YouTube the day before the meeting on the subject every week. Here are some examples of applications.

Figure 1. Some videos of the Powtoon application that have uploaded
Source: YouTube

Students must see and listen to the contents of the video. Also, students have obligations, namely Routine Duty related to the six tasks of the KKNI, namely answer the questions given related to the videos uploaded, which was then discussed in class. Not always done in class but on a schedule that is specified, learning done through the WhatsApp application. Students very positively responded to it. They assume they can be freer to ask without having to hesitate in raising his hand in the classroom when asking. After conducting a learning meeting via WhatsApp, the next meeting held at the school. When this situation occurs, students become more active in asking questions and giving opinions when the lectures take place. And students are also looking forward to learning when it's done outside the classroom because they can freely search for the source of the subject matter studied.

There are several obstacles in the process of developing IT-based media (Powtoon) and their implementation using the Blended Learning method. The obstacle of this study is that researchers do not know to make media using the Powtoon application. IT-based media development through the Powtoon application is very time-consuming, and researchers must think carefully about all the things faced when implementing student learning together. Essential things in developing ICT-based learning media are goals, abilities, users of time, effectiveness, learners, flexibility and costs [10].

Beyond the obstacles faced, The results of media development through Blended Learning have a lot of positive effects, especially for students who take this Mathematics Learning Method course. Among them material can be given anytime and anywhere, students are more flexible in various teaching materials/materials with multiple learning resources such as books, internet, journals, and others. That way the lecturer can use this to ask students to study the material before learning begins, because knowledge is carried out face to face in class and through the WhatsApp application,

communication between the lecturer and the student goes well, students feel closer and more open to their lecturers so that students do not hesitate to ask if they encounter problems with understanding the material. The following is a discussion with WhatsApp.

Figure 2. Learning through the WhatsApp Application

From figure 2, we can see the results of the discussion between the lecturer and students through the WhatsApp application. When discussing via WhatsApp, communication between students and lecturers and between students is excellent. These are because students feel comfortable discussing material through WhatsApp as if the discussion was a discussion like their daily communication with their friends. Another important thing is that learning becomes more flexible and enjoyable which has an impact on the learning motivation of all students as well as the achievement of planned learning targets. Proximity and discussion between students and lecturers can occur well and increase student motivation [16].

The use of IT-based media that uses the Powtoon application through Blended Learning can support the success of the KKNI. It is because, IT-based press and the use of Blended Learning are in line with the objectives of the KKNI, namely preparing students to be more competent and professional in their fields. Following the Rationale / Rationalization of the Development of University Curriculum by I made Supartha Utama dan Desak Made Wihandani, stated that there needs to be a change in literacy in the face of the Industrial Revolution Era 4.0 so that graduates can be competitive. Therefore, according to the policy of the Directorate General of University, must reorient the curriculum by conducting new data-based literacy, technology, and humanities [11]. These are following the KKNI curriculum. Besides, it is also recommended to apply Hybrid / Blended Learning. Of course, if this is done consistently, it can help the process of accelerating the creation of General Education Industrial Revolution 4.0 or called the GEN-RI 4.0 in Indonesia.

In learning, innovation is needed for the learning device. Where the aim is to be able to adjust and meet the needs of the current situation. The importance of developing learning tools because of the development and careful planning can improve the ability of understanding and communication of

mathematics [12]. Blended Learning is a new way to improve learning and learning processes [13]. Blended Learning is also very appropriate if applied to LPTK Higher Education institutions, because of the challenges of developing 21st-century teacher competencies related to technology, pedagogy and the content of learning that is taught. The linkages between the three aspects are very close and influence each other to get maximum results. Therefore, IT-based learning with Blended Learning is a very suitable blend. The technological features that seem necessary in order to explore mathematics teacher noticing within a problem solving interview include (a) the capture of every utterance or artifact, (b) ability to re-watch anything previously written or recorded, (c) virtual interactions so both parties do not have to be physically present, and (d) immediate access of a fellow math educator for teacher support [14].

The technology class noted that holding synchronous discussions online utilizing a collaborative office software platform may be preferable to a discussion board. This strategy would not only allow a real-time back-and-forth discussion to proceed but also allow for collaboration on assignments and projects. The spatial reasoning class suggested it might be better to use social media platforms to facilitate useful discussions among the class participants. The technology class also saw the importance of using a good course management system to enable the organization of assignments, grades, due dates, and so forth [15].

4. Conclusion
The conclusion obtained from this study has been produced IT-based learning media products in the form of the use of PowToon applications in the Mathematics Education Research Methods course which valid with a percentage of 91% with a very valid category. And also produced integrated IT-based learning media 6 Tasks of the KKNI through Blended Learning methods help with an effective WhatsApp application, indicated by student activity results of 89% and student response was 93% in the Mathematics Department of Medan State University.

5. Acknowledgment

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