Website design of *Capita Selektta Mathematics Course* for mathematics education students

Musa Thahir, Yenita Roza* and Atma Murni
Universitas of Riau

E-mail: *yenita.roza@lecturer.unri.ac.id

**Abstract.** This article is based on the use of learning models that are limited to the subjects of Kapita Selektta Mathematics. This article aims to explore the results of the development of a website for learning Kapita Selektta Matematika (KSM) on UIN Suska Riau students that is valid, practical and effective. This research uses a development research model of Borg and Gall. The research instruments used in this article are validation sheets (validity aspects) by involving 6 validator lecturers, lecturer assessment sheets and student assessment sheets (practical aspects) involving 5 students, and student learning outcomes tests (aspects of effectiveness) involving 28 students. The data in this research is analyzed using quantitative and qualitative descriptive. This results in a course learning website which is valid (the average overall aspect of material validation was 4.15 and the average overall aspects of validation technology is 3.98), practicality score is 4.23 with the category “GOOD”, and effective (Sig. 0.000 <Sig (1-tailed) 0.05). Thus, student-learning outcomes after using the learning website are better than before using the learning website. Based on the tests carried out, the development of the overall learning website on the material and technological aspects can be categorized as feasible, while the practical aspects can be categorized as practical, so this learning website can be used as a learning medium to help the learning process.

**Keywords:** Development research, Website, Kapita Selektta Matematika

1. **Introduction**

Mathematics Education Study Program FTK UIN Suska Riau aims to educate prospective mathematical educators to have pedagogical, professional, social and personality competencies. Those competencies should be integrated with Islamic values in mathematics teaching and learning. Mathematics learning is a mental activity in gaining an understanding of meaning which is then applied in real conditions. Therefore, the role of lecturers is highly expected towards the process of achieving goals and stages of lectures in helping students to achieve maximum learning.[1] Based on author’s experience in teaching for the last few years various characteristics of mathematical learning have been identified, especially in Kapita Selektta Matematika (KSM) subjects, namely: 1) Teaching is done by lecture methods, 2) students are less involved in understanding concepts, 3) students is overload with topics of lecture 4) lecture material presented do not connected to the concepts learned in high school and 5) Evaluation activities do not involve students. This limitation has an impact on KSM courses, it can be seen from students’ achievement on the end of the course. Only 27% of students complete the course with maximum score.

The facts above indicate that efforts are needed to improve the lecture process for prospective mathematics teachers. One the efforts that can be made through improving the quality of education are focused on developing capabilities of lecturer. Therefore, in mathematics class a learning strategy...
needed is an interesting and easily understood by students and can increase student motivation. One of learning strategy that can improve students’ motivation is by using the internet. The influence of motivation and advances in modern technology will certainly affect the development of the world of education, both in the field of education and in the process of obtaining or transferring knowledge easily. [2]

Internet can be utilized for learning by lecturers and students through the use learning website. The Website is a system on the internet that allows anyone to access and provide information. By using this technology, information can be accessed 24 hours a day and managed by a machine.[3] According to Rusman in Aryaningrum, website-based learning (E-Learning) is a learning activity that utilizes media sites (websites) that can be accessed through the internet network.[4] Furthermore, he said, with website-based learning (e-learning), especially the web-enhanced course, it is expected that students will not be bored to involve in the teaching and learning process, and also expected to make students think creatively and actively.[4] According to Kurniati, et al. that users (students) can display learning material using internet browsers (internet browsers) such as Internet Explore and Mozilla that are available on computers in laboratory study programs, at home and at internet cafes or use laptops and mobilephones.[5] Thus, the implementation of a web-based learning process as a learning medium is highly dependent on the availability of the internet, although this process can be carried out in a computer laboratory or laptop and cellphone by storing the necessary files.

Some studies are relevant to this research, namely: 1) WP as a complex method of an educational and training activity;[6] 2) The process of implementing virtual learning with the concept of virtual classroom (VC);[7] 3) The development of WP in the course of the electric machine setting.[8] and 4) The development of interactive online listening task learning models for ELF learners in China.[9] The results of these studies show us that the lecture process through the web demands not only student skills in using computers, reading and writing but also providing demands on personal attitudes that are transparent, disciplined and independent. Another case with the results of research in this article is not on the use of models but in the form of learning websites that are used as media in the delivery of learning materials online. In addition, this product has control over the number of student visits / activities in using this mathematics learning website so that the lecturer is able to see the students who are most active or use the learning website more often.

Based on these explanations, the author identify the need for learning activities that lead to the learning process through the use of information technology, especially learning websites. seeing this potential encouraged the writer to collaborate between the desire of the lecturer to start learning with a simple learning website developed. However, WP has the main problem, namely infrastructure, especially in WiFi/hotspot facilities. The importance of using WP is due to several advantages for students such as: 1) helped students learn independently; 2) students can learn actively; and 3) provide additional learning resource that can be used to enrich learning material.[14]

Based on this explanation, the next author will develop a learning website that will be presented in this article with research questions: 1) How is the process of developing learning websites in the course of Kapita Selekta Mathematics to improve student learning outcomes that are valid, practical, and effective?; and 2) What are the results of the development of learning websites in the Kapita Selekta Mathematics course to improve student learning outcomes that are valid, practical, and effective? Based on the research question, this article has the purpose to describe: 1) the process of developing learning websites in the course of Kapita Selekta Mathematics to improve student learning outcomes that are valid, practical, and effective?; and 2) the results of the development of learning websites in the Kapita Selekta Mathematics course to improve student learning outcomes that are valid, practical, and effective.

2. Research Method
This research uses the Borg and Gall Research and development model to produce a learning website. The quality of the product in this research is measure by the validity, practicality, and effectiveness. Components of validity are content feasibility, linguistic, presentation, and graphic.[10] Sukardi stated
that practicality can be seen in aspects of: 1) utility; 2) time; 3) Attractiveness; 4) easily interpreted by the teacher; and 5) the equivalence. [11] Van Den Akker in Rochmad stated that “Effectiveness refers to the level consistency of the experience and results of the intervention with the intended purpose”.[12] This opinion also supported by Dimyati and Mudjiono who stated that “learning outcomes are the culmination of the learning process.”[13] Based on these explanations, WP development can be implemented properly if it meet the criteria of validity, practicality and effectiveness. The steps in this research include:

**The first stage**, potential and problems phase. Efforts to be done: exploring potential and problems of using technology and identification of utilization of website-based learning. Process: direct observation and unstructured interviews. Expected Results: following up on the development of learning websites. **The second stage**, data collection phase. Efforts to be done: data will be used as a source of WP production and preparation of learning material. Process: source or reference and use of XAMPP software, Notepad ++. Expected Results: lecture material is arranged properly for the initial draft of learning website development. **The third Stage**, product design phase. Efforts to be done: arranging material; Preparing questionnaires; Develop format of the initial product. Process: source or reference and use of XAMPP software, Notepad ++. Expected Results: lecture material is arranged properly for the initial draft of learning website development. **The fourth stage**, design validation phase. Efforts to be done: material and technology experts will assess the material and design of the learning website. Process: material expert validation sheet and technology expert. Expected Results: valid content and learning website design. **The fifth stage**, design revision phase. Efforts to be done: improve product design based on validator input. Process: the author adjusts the content of product as advise of validator. Expected Results: having better product design. **The sixth stage**, small-group product testing stage. Efforts to be done: conducting small-group trials involving 5 students. Process: provide comments and suggestions about the learning website (practicality test). Expected Results: response of lecturers and students about content and practicality of product. **The seventh stage**, product revision phase. Efforts to be done: make improvements related to the suggestion of lecturers and students on content design and learning websites. Process: the author directly adjusts to the suggestions of lecturers and students. Expected Results: material and practicality learning website design. **The eighth stage**, large-group product testing stage. Efforts to be done: conduct large-group trials involving 28 students. Process: using the wp for 6 meetings to see student learning outcomes. then, at the last meeting a written test was carried out to see the effectiveness of using the wp in ksm courses. Expected Results: the response of lecturers and students about material and design of a practical learning website. **The ninth stage**, product revision stage. Efforts to be done: make improvements related to the suggestions from students on material design and learning websites. Process: the author directly adjusts to the suggestions of students. Expected Results: good students’ achievement. **The tenth stage**, mass production stage. Efforts to be done: conducting socialization and dissemination of wp products. Process: teaches how to use learning websites to lecturers. Expected Results: published in a journal or proceeding.

The research instruments used in this article are validation sheets (validity aspects) by involving 6 validator lecturers, lecturer assessment sheets and student assessment sheets (practical aspects) involving 5 students, and student learning outcomes tests (aspects of effectiveness) involving 28 students. The data in this research is analyzed using quantitative and qualitative descriptive.

3. Results and Discussion
The development procedure in this article includes steps that can be explained in detail as follows:

3.1. Potential and Problem Phase
The researcher carries out the stages of exploring potential and problems by direct observation and unstructured interviews. Through direct observation, information is obtained that: 1) lecturers tend to deliver courses with conventional strategy; and 2) lecturer had limitations in using the internet.
Therefore, researchers see the potential that can be developed through the use of android technology that is very close to students. Whereas through unstructured interviews, information is obtained that:
1) lecturers and students do not understand the importance of the existence of WP; 2) WP has good benefits and quality in supporting the mathematics learning process; 3) the main problems in implementing WP are infrastructure, especially in WiFi / hotspot facilities and the ability of lecturers; and 4) Mathematics Education study programs should be able to create internet networks so that they would help lecturers and students to take advantage of these facilities. Based on the potential and problems above, researchers followed up with the development of learning websites in accordance with expectation of the Mathematics Education study program.

3.2. Data Collection Phase
At this stage, the activities carried out are collecting data that can be used as a source of WP production and preparation of learning material collected from various sources or references. Sources or references for developing mathematical learning websites are obtained from relevant sources, including: 1) Algebra and Trigonometry by Brown; 2) Class Mathematics Teacher Books SMA / MA / SMK / MAK Revised Edition 2017; 3) Calculus by Franks Ayres; and 4) Trigonometry by Franks Ayres. In addition to books / references and curriculum also using XAMPP software, Notepad ++ is a tool for researchers to develop WP to be better.

3.3. Product Design Stage
At this stage, researchers carry out phases of WP product design through three main stages, including: 1) preparation of material; 2) preparation of questionnaires; and 3) development format of the initial product. This stage of design is carried out using sources or references that are used at the stage of data collection and use of assessment instruments.

The Preparation of Material Phase, in this phase WP was compiled and developed through the process of compiling material with the following details: 1) Functions, Composition Functions, and Inverse Functions; 2) Definition and types of ethnicities, determine the value of lots by various methods, and inter-ethnic operations; 3) Similarity to sukubanyak, division of sukubanyak with linear shaped divider, the distribution of sukubanyak with dividers in the form of squares; 4) Remnant theorem, factor theorem, sukub Roots, Vieta theorem; 5) Definition of sequences and series, sigma notation and its properties, the arithmetic sequence and series, the geometric sequence and sequence; 6) Rows, middle terms, inserts, and arithmetic series, sequences, middle terms, insertions, and geometric series; 7) Infinite geometry series and applications of arithmetic and geometry sequences and series; and 8) Trigonometric comparisons of right triangles, related angles, identities, rules of sines and cosines.

Initial Product Design Stage, presentation of results of the WP initial product mix on the KSM course, namely the description of the website resulting from the development. Formulation of Questionnaires, this research instrument using a validation assessment questionnaire, a practicality assessment questionnaire. Stage of Development of Initial Product Format, presentation of results of WP development of KSM courses, namely website description of development results. Description of website development results in the form of a brief description of the contents of the WP course KSM.

3.4. Stage of Design Validation
At this stage, the researcher carried out the product design validation by involving two experts, in material and technology aspects. Based on the results of the material expert the overall aspects of material validation are 4.15 with the category “VALID”. While the results of the validation of technology the overall aspects of technology validation are 3.98 with the category “VALID”. Based on the results of the overall validation can be concluded that web learning has a category “VALID”, so that web learning and research instruments are feasible to be used in testing small products.
3.5. Design Revision Phase
At this stage, researchers make improvements related to the suggestion of material and technology experts. The researcher made these improvements by clarifying the definition of a triangle, adding information on each image, being consistent in function writing, clarifying proof, and using more precise mathematical symbols. In addition, the researcher also made improvements to the appearance of the website, such as coloring and background aspects, and the use of icons that differed between lecturers and students.

3.6. Small Scale Product Testing Phase
At this stage, researchers conducted a small-group product trial involving 5 students in the mathematics education study program. This stage is done by asking students to give comments and suggestions regarding WP. The results of this stage are obtained from student assessment questionnaires which include aspects of website usage, appearance, readability, and presentation. Based on the results of the WP assessment by 5 students, the average overall score is 4.23 with the category “GOOD”. Overall, WP is suitable to be used in large-group product testing for effectiveness test.

3.7. Product Revision Phase
At this stage, researchers make improvements based on the results of small-group product trials. Improvement is done by clarifying the instructions for user and edit some program errors to make WP has clear instructions and well-run.

3.8. Large Scale Product Testing Phase
At this stage, researchers conducted a large-group product testing stage (effectiveness) involving 28 students to find out the effectiveness of WP. The researcher conducts this stage by utilizing the WP for 6 (six) class meetings, ended by written test to see learning outcomes. Learning outcomes show that 78.57% of students pass the minimum criterion score. Overall students’ achievement exceed the minimal classical score, which is 70%. This means that the WP that has been developed is effective.

3.9. Product Revision Phase
At this stage, the researcher suppose to make improvements for WP, but the user mention the product is good and interesting, the material and images on the WP are good and the WP is easy to understand both from the content, material and questions so that researchers feel no need to revise and WP ready to be used for the next step.

3.10. Mass Production Stage
The final stage in this research and development is the dissemination and implementation phase. The purpose of this stage is to report on the results of research on the development of learning websites on the subject of Kapita Selekta mathematics to improve student learning outcomes in seminar results then publicized in journals or proceedings.

The main results of the findings of this article are learning websites for Kapita Selekta Mathematics class in the form of e-learning. Some appearance of this product can be seen in the following picture.
The 7th South East Asia Design Research International Conference (SEADRIC 2019) IOP Publishing
IOP Conf. Series: Journal of Physics: Conf. Series 1470 (2020) 012092 doi:10.1088/1742-6596/1470/1/012092

Figure 1. Main Page and Features

Home page consists of the title WP MATH (Learning Website) MATH, Welcome To Mathematics Learning Web, Welcome and Hopefully Helpful, and Learn More. The selected image on the home page is adapted to the subject matter, namely mathematics learning. Whereas on feature page it offer a choices of menu including: 1) Online distribution of Modules; 2) Online Discussion; 3) Online Announcements; and 4) Interactions.

Figure 2. Gallery Page and About Us

The Gallery page contains documentation of Lecture Activities and Other Activities in Mathematics Education Study Program, such as classroom activities, lecturer meeting activities, and updated mathematics education study program activities. While the profile page contains about information of the author, the product, and the facilities provided by this WP.

Figure 3. Page of the Design Team and Contact Us
This Compilation Team page contains information of people involved in the process of implementing a mathematics learning website that has competencies according to system design needs. While on our contact page it contains the address and contact of the researcher to help students and other visitors who experience problems or need information about this learning website.

![Image](image1.png)

**Figure 4.** Sign Up the page and Web Forum Login

On this web forum page, users, both lecturers and students, will login into WP, but they must register by provided data of their first name, last name, email and password. After log in, lecturers and students will be presented with different menus. For more details, the following will be described.

![Image](image2.png)

**Figure 5.** Home Page and Lecture Material (Lecturer Login)

This home page menu present the outline of the Kapita Selekte Mathematics course. This course material menu help lecturers input his lecture material for each meeting. Teaching material can be input in the form of text (PDF, PPT, Word) and video/audio. In addition, this menu also use to input questions that are given a time limit. In addition, on this menu there is also available a sub-menu that contains tasks assigned by the lecturer to be done at home with the time limit set by the lecturer.

![Image](image3.png)

**Figure 6.** Quiz Page and Tasks (Lecturer Login)
This quiz menu serves to present quizzes which are given every 4 (four) meetings in the form of description questions. This menu use to present the assignment given in each meeting in the form of a description question.

![Quiz Menu Example]

**Figure 7. User Statistics Page and Verification (Lecturer Login)**

The user statistics menu use to see how active students are in using this mathematics learning website. This verification menu serves to verify the user who registered on the web form and ensures that the user is really a student in the class. Lecturers and students will also log in to web forums. When students have successfully logged in, the following page will be presented on the page.

![Statistics Menu Example]

**Figure 8. Home Page and Lecture Material (Student Login)**

This homepage menu serves to see the outline of the Kapita Selekta Mathematics course. This lecture material menu serves to view lecture material at each meeting both in a file and video form and on this menu students can also download lecture material provided by lecturers in WP.

![Lecture Material Menu Example]

**Figure 9. Quiz and Task Pages**
This quiz menu serves to see a list of quizzes made by lecturers. In addition, this menu can also function to see champions in each quiz given and see the progress of student learning. This task menu serves to see a list of tasks made by the lecturer.

Based on the results of the explanation above, research results in a valid Kapita Selektta Mathematics course learning website (the average overall aspect of material validation is 4.15 with the category “VALID”; and the overall overall aspect of technology validation is 4.07 with the category “VALID”), practical (the average overall aspect obtained from student assessment is 4.23 with the “VERY PRACTICAL” category), and effective (Sig. 0.000 < Sig (1-tailed) 0.05). This result is in line with the results of the research conducted by Setiyadi and Qahar that the results of the validation of material experts and media experts showed an average score of ≥3 ≥3 for each aspect assessed.[15] Furthermore, it was said that the results of the trial also showed that the media was able to motivate students to learn mathematics.[15] Furthermore, web-based learning media can increase student motivation in learning mathematics.[16] The three results of these studies reinforce the conclusions stated by Chandra and Amirrudin that the use of web-based learning can improve student learning outcomes.[17]

As expressed by Agustina in Thahir, Roza, and Murni, namely: 1. The use of e-learning as a learning media has a fairly good category; 2. The dimensions of Nonlinearity, Self-managing, Just in Time, and Easy Accessibility have quite good categories, while the other dimensions have categories that are not good; and 3. For the development of Bina Darma University’s e-learning, the characteristics of e-learning are not yet good, so that it can be improved so that e-learning as a learning media is utilized properly by the UBD community.[14] Therefore, it takes a full encouragement from UBD management to utilize e-learning as a learning media both in the form of instruction and policy. The same thing was also conveyed by Harahap and Fauzi that the web-based mathematics learning module has a potential effect on student learning outcomes, so it can be concluded that learning to use a web-based mathematics learning module is already good to develop.[18] Based on the large-scale trial phase conducted to 28 students through the use of the learning website for 6 meetings using the learning outcomes test instrument gives an indication that the treatment that researchers do is capable of producing improved quality of lectures, because the lecture process is not only fixed at one time and in the room only.

Strengthening the arguments above, Harahap in Thahir, Roza, and Murni revealed that related to the use of e-learning based on management content learning systems or Moodle Learning Content Management System (LCMS) as a media lecture SIA subjects gave the conclusion that for SIA courses at the Faculty of Economics UMSU/ will influence disciplined lectures. Student competency in the SIA course will certainly improve and display a forum for joint learning and lecture itself. The evaluation carried out by lecturers for students was more timely to become a guideline in making student evaluation reports.[19] The use of android based e-tutorials increases the mastery of knowledge and teachers consider learning more fun, faster and easier than traditional tutorials. The advantages of android based e-tutorials because it can be accessed anywhere and anytime, thus increasing participants' control of learning.[20]

Based on relevant research conducted by experts in their fields, it shows that the development of learning website models in the Kapita Selektta Mathematics course has produced characteristics of research results that utilize the web as a learning tool. The results of large-scale product trials show that product development can have an impact on improving and improving learning methods by utilizing the learning web. In the college environment, the benefits of the learning process carried out with the help of the web are able to overcome various obstacles in conventional learning, especially the limitations of teaching materials, learning resources and time can be mediated with the help of learning webs. The learning process is assisted by this website, for lecturers can upload concept maps, learning objectives and some appreciation questions in a site or website, so students can access them before the lecture takes place. Through the use of the website, students can access material according to whenever and wherever they need it in order to be able to repeat material that is not yet understood.
4. Conclusion
Based on the results of the study can provide conclusions as follows: 1) the process of developing a learning website consisting of potential and problems, data collection, product design, design validation, design revision, limited scale trials, product revisions, wide-scale revisions, product revisions, and product revisions. mass production. The product results are in the form of a learning website with the address http://www.wpmath.id; 2) research results in a valid Kapita Selekt Mathematics course learning website (the average overall aspect of material validation is 4.15 with the category “VALID”; and the overall aspect of technology validation is 4.07 with the category “VALID”)., practical (the average overall aspect obtained from student assessment is 4.23 with the “VERY PRACTICAL” category), and effective (Sig. 0.000 <Sig (1-tailed) 0.05). Thus, student learning outcomes after using the learning website are better than before using the learning website. Based on the tests carried out, the development of the overall learning website on the material and technological aspects can be categorized as feasible, while the practical aspects can be categorized as practical, so this learning website can be used as a learning medium to help the learning process.

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References
[1] FitrI H S R and Helma 2014 Penerapak strategi the firing line pada pembelajaran matematika siswa kelas XI IPS SMA Negeri 1 Batipuh J. Pendidik. Mat. 3 18–22
[2] Zakaria M I 2016 Pengaruh motivasi dan penggunaan internet terhadap prestasi belajar siswa dalam pembelajaran sejarah di MAN 2 Yogyakarta tahun ajaran 2015/2016 J. Risal. 1 1–9
[3] Nugroho A 2012 Pengembangan model pembelajaran jarak jauh berbasis web J. Transform 9 72–6
[4] Aryaningrum K 2016 Pengaruh pembelajaran berbasis web (e-learning) terhadap hasil belajar siswa pada mata pelajaran geografi kelas XI di SMA Negeri 9 Palembang J. Media Penelit. Pendidik 10 154–62
[5] Kurniati D and Trapsilasivi D 2014 Pengembangan model pembelajaran analisis real berbasis web dalam bentuk E-Learning J. Kadikma 5 1–12
[6] Lawanto O 2001 Pembelajaran berbasis web sebagai metoda komplemen kegiatan pendidikan dan pelatihan Unitas 9 44–58
[7] Suranto B 2009 Virtual Classroom: Strategi Pembelajaran Berbasis Synchronous E-Learning Seminar Nasional Aplikasi Teknologi Informasi 2009 (SNATI 2009) D78–D86.
[8] Tambunan H 2013 Pengembangan pembelajaran berbasis website dalam mata kuliah pengaturan mesin listrik Cakrawala Pendidik. 22 64–76
[9] Tian X and Suppaseteree S 2013 Development of an instructional model for online task-based interactive listening for EFL learners English Lang. Teach. 6 30–41
[10] Depdiknas 2008 Panduan Pengembangan Bahan Ajar (Jakarta: Direktorat Pembinaan SMA)
[11] Sukardi 2008 Metodologi Penelitian Pendidikan, Kompetensi dan Praktiknya (Jakarta: PT. Bumi Aksara)
[12] Rochmad R 2011 Model Pengembangan Perangkat Pembelajaran Matematika UNNES, 2011.
[13] Dimyati and Mudjiono 2006 Belajar dan Pembelajaran (Jakarta: PT. Rineke Cipta)
[14] Thahir M, Roza Y, and Murni A 2018 Identifikasi persepsi dosen dan mahasiswa terhadap pembelajaran berbasis website (PBW) di prodi pendidikan matematika FTK UIN Suska Riau Elemen 4 159-70
[15] Setyadi D and Qohar A 2017 Pengembangan Media pembelajaran matematika berbasis web pada materi barisan dan deret Kreano 8 1–7
[16] Hartono E 2012 Pengembangan Media Pembelajaran Berbasis Web pada Materi Bangun Ruang
Sisi Datar Kelas VIII SMPN 1 Bantul UIN Sunan Kalijaga

[17] Chandra A E 2013 Pengaruh pembelajaran matematika berbasis web terhadap hasil belajar siswa pada pokok bahasan peluang (Studi Eksperimen di Kelas XI SMK Pariwisata Kota Cirebon) EDUMA 2

[18] Harahap M S and Fauzi R 2017 Pengembangan modul pembelajaran matematika berbasis web,” J. Educ. Dev. 4 13–17

[19] Thahir M, Roza Y, and Murni A 2018 Validity of learning website of kapita selekta mathematics course at UIN Suska Riau students Malikussaleh J. Math. Learn. 1 19–25

[20] Roza Y, Daqiql I, Siregar S N, Salam S, and Adnan A 2018 android based e-learning tutorial for mathematics teachers J. Phys. Conf. Ser. 1088 012005