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The development of BOT API social media Telegram about plant hormones using Black Box Testing

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Abstract. Social media becomes an inseparable phenomenon in everyday life. Similarly, how learners learn not only from conventional books or online learning. Social media has now become a medium for learning anywhere anytime and joyful. Based on these opportunities, researchers plan to develop a media-based social media applications, especially telegram BOT API with plant hormones material. Media application development method using black box method, consist of (1) feasibility study, (2) requirements, (3) System design, (4) Encoding, (5) Testing system, (6) Acceptance Test. The method in this study is limited to sample testing on media experts. The result of this study are validators rate more than 85% media validation consist of quality of visual and auditory perception, ease of interaction, ease of learning to interaction and ease of use, meanwhile user response consisting of efficiency 79%, usability 85%, cognitive absorption 79%, and enjoyment 86%. This implies that the application can provide benefits for learners who will learn plant hormones base on social media.

1. Introduction

Biology lessons are especially enjoyable with regard to plant matter [1]. Plants that grow around the house grow into adults require hormones in accordance with the characteristics of these plants [2].

It seems to be fun if the above plant physiology [3] can be learned using social media-based applications will be more interesting such as using social media Telegram, Facebook Line, Twitter or Instagram. But in this study limited by using Telegram application.

Lessons about plant hormones are usually teachers or lecturers teaching with PowerPoint slides [4] or viewing links of YouTube videos, thus requiring variations of learning media. Teachers or lecturers are required to be more creative in delivering materials. Lecturers must be open with the changing times and able to absorb each opportunity so that they can take it as an idea or method in the teaching and learning process. Teachers / Lecturers pay more attention to the needs of teaching materials for students with the ease of information technology [5].

Various media and methods used by lecturers such as lecture methods, the use of power points, discussions and questions answered apparently have not been able to facilitate students to learn more seriously. It is also implemented in research that produces valid learning tools and interactive practices based on Lectora Inspire learning media. From the research used to know student response to learning tool, and to know the result of student learning after using Lectora learning media. The results of this

study prove that the students are very satisfied with the learning media by achieving 85.9% while the percentage of graduation rate reached 84.375%. [6].

Applications using information technology that has been done in making mobile-based portfolio electronics for makeup students found that students are more interested in creative learning media, as evidenced by the response obtained an average response on a scale of 3.31, of the total scale 5. One advantage of smartphone technology namely as audio visual media can help improve students' understanding to display learning materials in video form with more real [7].

People use social media tools for various reasons. The survey was also set to find out student perceptions of social media adoption [8].

2. Literature review

2.1. Telegram BOT
Telegram messenger [9] one of Social Messenger is full of unique features. One of them is its bot feature (Telegram Bot), and with the open source feature of Telegram Messenger so we feel free to do anything against Telegram Messenger. Telegram Bot API offers a platform for developers that allows them to easily capture sensor data and turn it into useful information. Using the Telegram Bot API platform to send data to the cloud from Internet-enabled devices [10, 11].
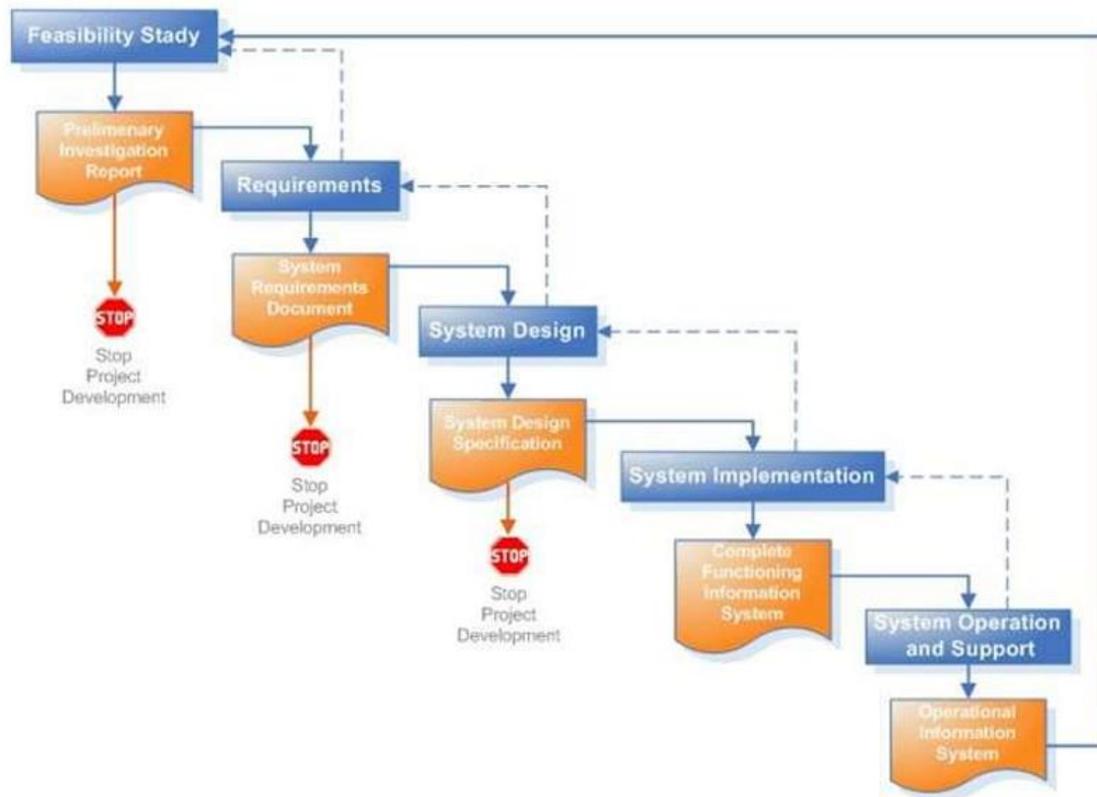
2.2. Plant hormones
Broadly speaking, there are 5 kinds of plant hormones that all play a role in growth and development, among others [2-3]: (1) Auxin Hormone (2) Hormone Cytokinin (3) Giberilin Hormone (4) Absisic Acid (5) Ethylene Gas.

Learners who want to learn about plant hormones should look in books or the internet. If described briefly plant physiology [1-3] as follows: (1) *Auxins* affect the growth of stem length, growth, differentiation and root branching; fruit development; apical dominance; phototropism and geotropism. Place of production: Meristem apical shoots tip, young leaves, embryo in seeds. (2) *Cytokines* Contribute to root growth and differentiation; encouraging cell division and growth in general, promoting germination; and delay aging. Place of production: At the root, embryo and fruit, move from root to other organs. (3) *Giberelin* encourages the development of seeds, bud development, stem lengthening and leaf growth; encourage flowering and fruit development; affect root growth and differentiation. Place of production: The apical meristem of the tip and the root; young leaves; embryo. (4) *Absorbic acid (ABA)* Inhibits growth; stimulates stomatal closure at water shortage, maintains dormancy. Place of production: Leaves; stems, roots, green fruits. (5) *Ethylene* promotes maturation; provides the opposite effect with some auxin effects; encourage or inhibit the growth and development of roots, leaves, stems and flowers. Place of produce: The fruit is ripe, the book on the stem, leaves are aging.

3. Methodology
In this research, the method used is Waterfall method [7], and using 10 validator media and content. This method has 6 steps (1) feasibility study, (2) requirements, (3) System design, (4) Encoding, (5) Testing system, (6) Acceptance Test. Below in figure 2 below is a brief description of each stage.

Figure 1. Flow method waterfall [7].

Phase I: **Feasibility study**. Things involved in the first phase such as understanding what needs to be designed as well as what function, the goal is to design a Telegram-based application with plant hormone material, install the BOT API. At this stage, the requirements to be fulfilled by the software are listed and detailed.

Phase II: **Requirements,** software, and hardware required for proper project completion are analyzed in this phase. The material to be put into this application should be able to support the side view because the use of applications using smartphones, how to update the material and questions, what features are needed.

Phase III: **System Design** The algorithm or flowchart of the program or software code to be written at a later stage, is made now. This is a very important stage, which depends on the previous two stages for proper implementation. The exact design at this stage ensures execution at a later stage. If during the design phase, there are some requirements to design the code, the analysis phase is reviewed and the design phase is done according to the new resource set.

Phase IV: **Coding** based on the algorithm or flowchart encoding of the software is done. At this stage ideas and flowcharts of the app are physically manifested. Proper execution of the previous stages ensures the implementation of this stage becomes smooth and easy.

Phase V: **Testing** With the encoding of the application completed, a written code test is now entered into the scene. The tests check for any deficiencies in the designed software and if the software has been designed according to the specs listed. Proper execution of this stage ensures that students who are interested in the software created will be satisfied with the product. If there is a shortage, the software development process should retreat to the design stage. At the design stage, the changes are implemented and then the next stage of encoding and re-testing is done.

Phase VI: **Acceptance** This is the last stage of software development in the waterfall model. The precise execution of all previous stages ensures the application complies with the requirements provided and, most importantly, ensures the student is satisfied. However, at this stage, it may be

necessary to provide support to students regarding the software that has been developed. If students demand further upgrades to be made to the existing software, then the development process should start again, right from the requirements. In this research is still limited to material experts who validate the media.

4. Results and discussion

The product produced in this research is learning media by developing social media telegram [8, 12, 9]. The media will contain material about plant hormone learning [2-3] in the form of materials, pictures, and questions.

To access this media using social media telegram, users must add @Plant HormonesBot account as a friend, after which the user can send a message with @Plant HormonesBot account to access the material therein as figure 2.
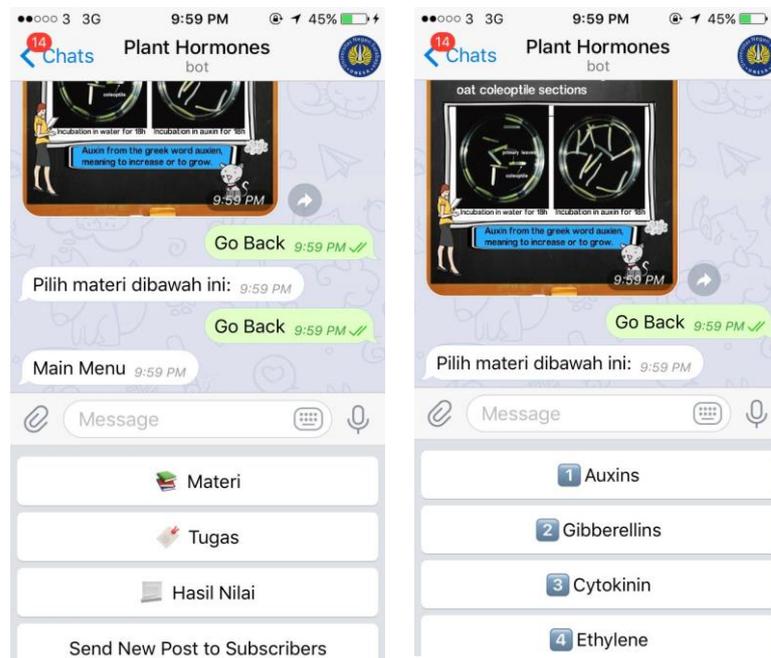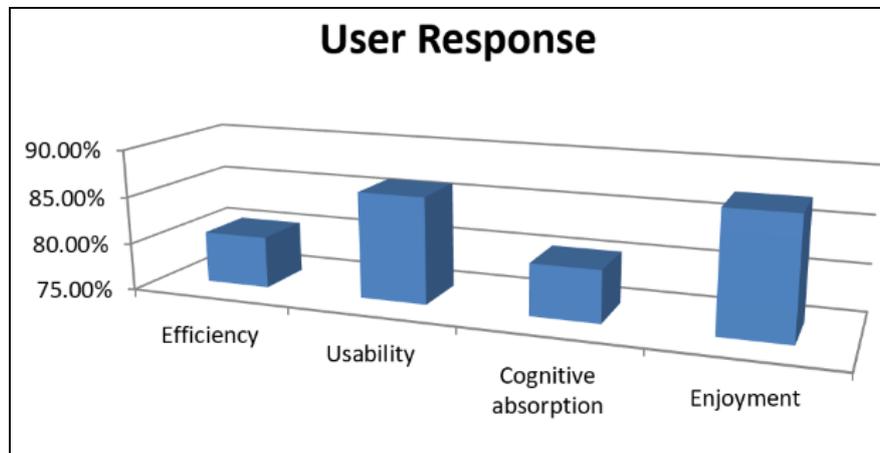

Figure 2: Interface the Telegram media social.
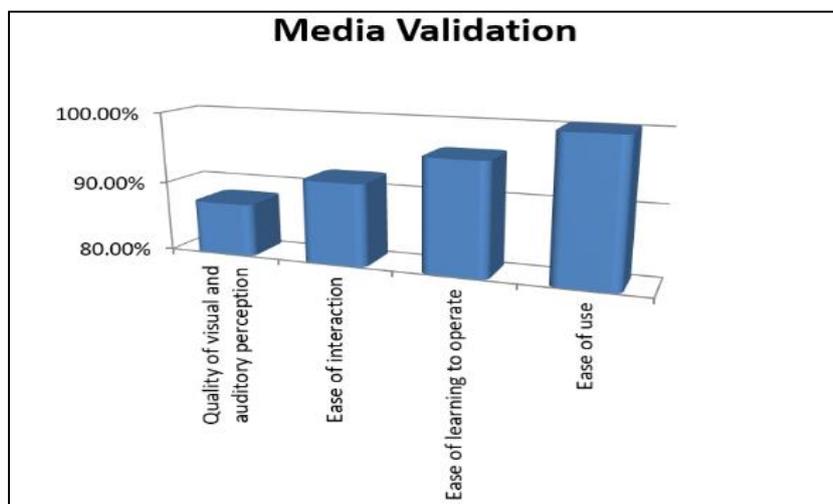
Figure 3. Media validation.

The validators rate more than 85% media validation consist of quality of visual and auditory perception, ease of interaction, ease of learning to interaction and ease of use as figure 3.

Figure 4: User response.

Meanwhile, user response consisting of efficiency 79%, usability 85%, cognitive absorption 79%, and enjoyment 86% as figure 4. This implies that the application can provide benefits for learners who will learn plant hormones base on social media.

5. Conclusion
Overall, this study sought to determine the plant hormones topics that students have difficulties learning, the reasons students have difficulties learning plant hormones and the ways students could learn any time. The validators' views reported here seem to contain valuable information for those interested in the plant hormones apps. Finally, they also suggested that students use various study techniques in order to be successful in learning biology especially plant hormones.

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