A Study on the Assessment of the Proposed Alitaptap Learning Management System Using SWOT Analysis

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***Abstract*—Most of the existing learning management systems (LMS) are designed and give students a steeper learning curve meaning, taking so much of their time in learning the system, or it would be their parents who would navigate the system for them. To address this issue, the researchers proposed Alitaptap, a learning management system (LMS) specially designed for kids at the preschool and elementary levels. It provides a child-friendly user interface, utilizing colors that would not only be attractive to them but also direct them to the right buttons. It would also utilize icons and images that would entice the user group to use the application more. It also has the functionality to download all the necessary files, presentations, and tasks for the week for the users to be able to do their tasks offline. This study tackles the use of SWOT analysis to be able to assess the Alitaptap app and identify its different strengths, weaknesses, opportunities, and threats. A questionnaire utilizing the six thinking hats strategy was utilized and distributed to different respondents and after the responses, a SWOT analysis was conducted followed by a TOWS Matrix to identify the state of the app. Overall, the Alitaptap app is a great potential product in the learning management system category aimed toward children.**

***Index Terms*—Learning management system, SWOT analysis, six thinking hats**

I. Introduction

Many schools and educational institutions are operating in the online environment due to the pandemic not allowing schools to have physical interaction. In line with this, they are utilizing various websites and software that enable them to interact with their students and employees and one of this software is called a learning management system. A learning management system is a web-based technology that is designed to improve the learning process of the students through its application, evaluation, and proper planning of the educational institutions. The main advantage of using a learning management system (LMS) is that it can help facilitate the learning of a student conducted through the online environment without the constraint of time or place, which can enable a professor and a student to interact with each other via the internet [1]. In line with this, not every student and teacher has the capability to access the internet all the time. According to a study by Manalo and Benavides, one of the main challenges that public school teachers are currently facing is the stability of internet connection when conducting online classes wherein they are always experiencing poor and unstable internet connection [2]. This can be applied to students as well wherein not everyone can have access to reliable internet at all times. In line with this, the majority of the LMS currently available today can only be accessed with an internet connection. And these LMS have a professional look, which is good for high school and college students but preschool and elementary students might have difficulty adjusting or being invested in these types of LMS. This is where the app, Alitaptap, comes in. Alitaptap is a learning management system (LMS) specially designed for kids in preschool and elementary levels. Since most LMS gives the children a steeper learning curve, Alitaptap implements a child-friendly user interface, utilizing colors, as well as icons and images that would not only be attractive to them but also direct them to the right buttons. Furthermore, it aims to download all the lectures and tasks for the week for the users to be able to do their tasks offline.

When it comes to its marketability, Alitaptap can be considered as a product with unique features, which in turn can be considered marketable. According to an article by BusinessWire, the global LMS market is expected to grow from $13.4 billion in 2020 to $25.7 billion by 2025 [3]. Also, with the rise in popularity of schools conducting online classes, the need for an LMS implementation increases. The product itself can stand out due to its features that are catered towards pre-school and elementary students, which can be considered a unique trait when compared to the more popular LMS today in the Philippines like Canvas and Blackboard. This can be supported by the survey conducted by the members of the group.

When it comes to the product's potential users, the demographic involved will be students that are in the elementary and preschool levels, meaning that they are the age 3–5 years old for preschool students and ages 6–12 for elementary students. These students are currently going through school in an online setting, which is implemented by their respective schools. Another potential user involved is the teachers who are in charge of teaching preschool and elementary school students. Any subject teacher is a potential user in this case and with the demographic, they must be a professionally licensed teacher in any subject that is currently living in the Philippines. The potential buyers for this product are schools that are currently implementing an online setting with their education system and are requiring the use of an LMS for their students.

Alitaptap is a learning management system (LMS) designed for preschool students. Our approach is to maintain good quality service, and a healthy learning environment for the users to enjoy. The core purpose of this is to offer a child-friendly user interface and its offline capabilities to better enhance their learning not just online but also offline. The programmers will be using Android Studio as its main

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Integrated Development Environment throughout the development of the project. The researchers will utilize Firebase as its database.

For the assessment, the authors created a prototype design for Alitaptap LMS, and sample user interfaces are presented.

The login page will provide security for the users. It will authenticate them on their credentials to continue access to the application. The profile system helps the teacher identify information about the student. These features consist of names, year level, age, and the name of their parents. The dashboard will serve as the main hub of the application. It consists of different n avigation buttons likeAnnouncements, Assignments, File downloads, community, and the subjects that the students are enrolled with.

The subject home page will help the students to navigate to their lecture materials, it has other features like scoreboards, reminders, tasks, and talk to the teacher. The subjects page provides all the different selections of enrolled subjects. The reminder tab informs the students about future tasks and activities. The lecture tab will provide the students with all the video lectures on different subjects.

These features were presented to the target users and used as the bases for evaluation for future changes and better output of the project. When it comes to the benefits, the Alitaptap app is a Learning Management System app that contains child-friendly features which are mainly targeted toward preschool and elementary school students. The product provides an online learning environment for preschool and elementary students, with colors, icons, and images that would be considered not only attractive to the students but can also be considered helpful for the students [4]. The product also contains simplified text, which can be easy for the students to understand and can result in much more productive learning. Another benefit of the app is that the app has offline capabilities wherein students with an unstable internet connection can still utilize the app as well. Its main offline capabilities include being able to view the last updated text and information and having the benefit of not needing to log in again to access the app [5]. Lastly, another benefit of the app is its lightweight space wherein the app itself does not need to utilize more than 50MB of space in a user's phone, meaning that it can easily be installed, even with a phone that can only store a few gigabytes of space [6]. The following are the benefits of the Alitaptap app, which can be considered unique from other popular learning management systems such as Blackboard and Canvas. With its lightweight space, child-friendly environment and features, and offline capabilities, the product can be one that many schools would seek, for the benefit of their preschool and elementary students in the current online setting.

Alitaptap would be targeted at schools focusing on elementary education. One of its strong points is that it is built for children. Having something tailored for children may increase their performance. It is designed so that the elementary students using the app will have an engaging experience when using the app. Not only that, Alitaptap enables offline content wherein students only need to download their lectures and tasks once per week and submit it anytime within the aforementioned, causing them to be able to manage their internet connections well, lessening the hindrance to quality education. In line with this, this study tackles the use of SWOT analysis to assess the different capabilities of theAlitaptap app.

II. Review of Related Studies

Related works of literature play a significant part in the implementation of the methods used as well as in the design of the Alitaptap mobile application.

A. At-Your-Service Mobile Application: E-Hub for Skilled Workers (2019)

A SWOT analysis is a type of analysis that is conducted whenever there is a product to be created and the creators or developers want to find a way how to know the different strengths, weaknesses, opportunities, and threats that their product could have. This type of analysis is conducted in the study by Dagdag *et al*. in 2019, which is entitled At-Your-Service Mobile Application: E-Hub for Skilled Workers [7]. The researchers conducted a SWOT analysis of their mobile application and were able to determine the disadvantages and advantages of the app that led to further improvements in the system.

B. Adopting the Six Thinking Hats to Develop Critical Thinking Abilities through LINE (2019)

The 6 thinking hats is a method that can be used whenever an individual is creating or making a complete product. It can also be used to enhance the critical thinking of learners and all people alike and this is what the study of Ekahitanond wanted to assess in their study entitled Adopting the Six Thinking Hats to Develop Critical Thinking Abilities through LINE. In the study, the Six Thinking Hats model was utilized to find out the critical thinking abilities of the students and teachers, as well as their motivation while learning [8].

C. Analysis of Current Situation of LMS Application in the Digital Era (2018)

Learning management systems have been used a lot to improve the learning experiences of students. Zhao, in 2018, analyzed literature related to LMS applications by using the SWOT/TOWS Analysis, which is often used in strategy formulation in the corporate world. Zhao stressed the need for conducting a SWOT Analysis, not limiting the basis of the requirements from the past and the present, but also considering trends in future development [9]. Furthermore, people have found the effectiveness of using technology to supplement traditional learning. Every student's life is impacted by e-learning [10].

D. Six Thinking Hats: An Analysis of the Skill Level of Jordanian Vocational Education Teachers and the Extent of SkillApplication (2019)

The six thinking hats technique can represent various ways of thinking, representing each with a colored hat. A study in 2019 aimed to understand the skill level vocational teachers have when it comes to the six thinking hats and to what extent they use the aforementioned in their classes [11]. The study concluded that the use of the six thinking hats model in learning improved the students' creativity and critical thinking skills, and had an effect on empathy skills. This

implies that the use of this model in education will lead to a positive effecton teaching.

E. SWOT Analysis (2016)

According to the Book of Sarsby, it stated that SWOT Analysis is easy to understand as it contains simple diagrams and no mathematics [12]. He stated that SWOT is relevant to many levels in an organization from an individual to the corporate strategy. Sarsby stated that SWOT treats circumstances in its delicate simpler way up to a thorough treatment for large and complex issues. The author stated that SWOT Analysis is highly visual for everyone to understand that is best used if presented to stakeholders. Alan Sarsby said that SWOT Analysis does not output a well-created strategy but insteadwill serve as a guide or a tool for your analysis for you to come up with a better strategy. The strength of SWOT Analysis is only as good as its operator where failure is caused often due to its creator's lack of understanding of strategy and theuse of SWOT Analysis itself.

F. Six Thinking Hats: A Study to Understand the Reasons and Extent of their Application in the English Language Classroom(2014)

Based on the study of Saroja and Khoo, the Six Thinking Hats are proven to strengthen the education of the students as their development notice a connection to their understanding of what they have grasped [13]. They stated that the six thinking hats are a successful tool that helps children develop a higher order of thinking skills while at the same time improving critical and creative skills.

III. Method

The assessment was made using a combination of quantitative and qualitative methods wherein a survey questionnaire was prepared using the six thinking hats concept to find out the various observations and opinions about the Alitaptap app because this method focuses on different points of view and thinking in six thinking roles[14]. The questionnaires were distributed to 50 individuals who were either a student, an instructor, or a parent.

Results were then tabulated, analyzed and categorized as Strength, Weakness, Threat, and Opportunity. Using SWOT Analysis helped the researchers to determine the areas for improvements on the proposed app while taking advantage of the opportunities and considering the threats and leveraging on their strengths. Then, TOWS Analysis was conducted to formulate strategies based on SO (strengths-opportunities), ST (strengths-threats), WO (weaknesses-opportunities), and WT(weaknesses-threats), that will further improve and strengthen the proposed design of the Alitaptap application.

IV. Results and Discussions

A. Survey Results

In the first question, the respondents were asked which of the mentioned features (Announcements, Video lectures, Profile, Chat with the Teacher, Reminders, Lectures, Tasks, Scores) are necessary for a student's learning using the Alitaptap application. Video lectures were the feature that the participants picked the most (94%). This is followed by lectures (92%) and tasks (90%). The profile feature was picked the least (60%). This would give the developers the idea.

Next, the respondents were then asked which of the mentioned features (Cartoonish images, color variety, size of the buttons, offline limitations, File storage functions, File storage size, App size, Compatibility, Smooth and easy to use, and accessibility) are the strong points. 78% of the participants picked color variety, followed by cartoonish images (72%) and offline capabilities as well as button sizes (66%) and these are considered the strong points of the application. Only one participant chose "smooth and easy to use" and accessibility. This would imply that implementing the top answers enables the application to give the best service to its users. However, since most of the respondents did notchoose accessibility and ease of use, the question also brought out what areas the applications need to improve.

Then, it was asked whether gamification would improve the value of the application. 62% of the participants strongly agreed, and 30% agreed. 8% remained neutral while none disagreed. This implies that the implementation of gamification in the application would lead to a better learning experience among the users of the application [15].

In the next question, the respondents were then asked which of the child-friendly features (Bright color schema, Use of cartoon characters, simple icons, easy-to-understand words) integrated into the application can be of most help to the students in terms of learning. The respondents favored the use of easy-to-understand words the most (96%), whereas the integration of simple icons was voted by 90% of the respondents. 80% of the respondents picked the use of cartoon characters and 76% picked a bright color scheme.

The respondents were then asked if they get bored when listening to a video lecture that is longer than an hour. 26% of the respondents always get bored, 40% often get bored, 15% sometimes get bored, 12% rarely get bored, and 6% of the respondents never get bored when doing so. This would give developers, and instructors as well, an idea of how long video lectures should be and what content these lectures would contain.

With the previous question, it was also asked if the respondents feel excited when listening to a video lecture that is shorter than an hour. 18% of the respondents always feel excited, 26% often get excited, 42% sometimes get excited, 8% rarely get excited, and 6% of the respondents never get excited.

It was then asked which of the mentioned features (Cartoonish images, color variety, size of the buttons, offline limitations, File storage functions, File storage size, App size, Compatibility, Smooth and easy to use, and accessibility) are existing weak points and hinder the application form providing its objective. The offline limitation was picked the most (18%), followed by application size (16%), and compatibility (12%).This would imply that these areas of the application need massive improvement to provide quality service to its users.

Next, the respondents were asked if a cartoon character providing a lecture would be preferable to an actual person

doing it in the context of providing education to elementary and preschool students. 86% of the respondents picked cartoon animation while the remaining 14% still prefer an actual person doing it.

Then, the respondents were asked how likely the application will become a solution for students who have online classesbut have a weak or unstable internet connection. The majority of the respondents picked highly likely (50%) and 26% picked likely. 4% answered highly unlikely while 2% answered unlikely. 18% remained neutral. Given this, the respondents thinkthat the application would be a competitive application to be used in online classes, even if there are existing problems with internet connections.

The respondents were then asked if they believe that the application is a necessary LMS for elementary and preschool students. 58% strongly agreed and 34% agreed. 8% remained neutral while none of the respondents disagreed.

It was then asked if the application is difficult to navigate. 36% answered not at all difficult and slightly difficult. 20% answered somewhat difficult and 8% answered difficultly. None of the respondents considered the navigation of the application very difficult. Given this, the application should still implement ways to make the user experience better, improving its usability and navigation.

The respondents were then asked if they believe that the application offers a great learning environment. 60% strongly agreed and 32% agreed. 8% remained neutral and none disagreed.

The respondents were also asked whether they believe that the application is a child-friendly app. 64% answered definitely and 30% answered probably. Only 6% only answered possibly and nobody thinks otherwise.

Lastly, the respondents were asked if they would recommend the application to a friend or colleague. The majority of the respondents (58%) answered highly likely and 38% answered likely. 4% remained neutral and none of the respondents would not recommend the application. With this, it is safe to say that the application left a positive impression among the respondents.

B. SWOT Analysis

After conducting the questionnaire that involves the six thinking hats strategy, the following SWOT Analysis was created, the study utilizes the SWOT Analysis to assess the development of the Alitaptap Learning Management System Application. This method analyzes the strengths, weaknesses, opportunities, and challenges that the application might face.

Strengths: According to the questionnaire, the app is a satisfactory LMS that is suitable for elementary and preschool students that are currently in online classes with its appeal in utilizing cartoonish images, color variety,and button sizes. Its strength also comes from its incorporation of video lectures, tasks, scores, and announcements, which improves the learning experience provided in the app. S1: Cartoonish images and color variety, as well as the size of buttons along with offline capabilities, make Alitaptap appealing. S2: The incorporation of normal and video lectures, as long as tasks, scores, and announcements regarding the subject improves the learning experience provided by Alitaptap. S3: Alitaptap satisfies the need for an LMS suitable for elementary and preschool students in online classes

Weaknesses: The app's weaknesses come from its implementation of offline capabilities, application size, compatibility, and navigation wherein some users agree that it can hinder the potential of the application. W1: Limitations on the implementation of offline capabilities, as well as the size of the application, and the application compatibility hinders the application form from providing its best potential. W2: Although a minority, some users experience difficulty in navigating through the application.

Opportunities: A variety of opportunities for the Alitaptap app are constructed from the questionnaire, wherein because of its status as an LMS, it is set to become a usable product with its features. Gamification is also a great addition to increase the attractiveness of the app, while also utilizing cartoon animations for video lectures that are shorter than 1 hour for children to be more excited. O1: Learning Management Systems are on the rise due to the majority of schools having shifted to online classes. Alitaptap, with its offline capabilities and child-friendly features, is set to become a usable product. O2: Adding gamification (making a course into a game) to increase the value and attractiveness of the Alitaptap application O3: Utilizing cartoon animations for video lectures for children to be more excited when learning a course or lesson while using Alitaptap. O4: Have video lectures that are shorter than 1 hour for an elementary or preschool student to be excited when learning or watching.

Threats: Threats are also located in the app wherein some users do not think that the application will improve the learning quality of the students. T1: Although a minority, some users do not think that the application, as well as its features, will not improve the learning quality students already have

C. TOWS Matrix

After conducting the SWOT Analysis, the TOWS Matrix as was made to analyze the different strategies that can be created from the strengths, weaknesses, opportunities, and threats of the Alitaptap Learning Management System Application. The following strategies were created: SO Strategy: By applying gamification that uses cartoonish images and a variety of colors, the Alitaptap app can become appealing and attractive to students. In line with this, cartoon animations can be incorporated into video lectures to be able to improve the experience of the student while watching a video lecture. Overall, Alitaptap is on the right trend to becoming a suitable product for elementary and preschool students [16]. WO Strategy: To address the navigation issues in the app, applying gamification can lead to much easier instructions and directions, with the presence of being in a game [17]. Also, by implementing appropriate features such as proper optimization, compatibility, and full offline capability, the Alitaptap can become a usable product in the market. ST Strategy: A proper consultation with the experts in the field of education and design can lead to the improvement of the students' learning while using the Alitaptap app. WT Strategy: Utilizing proper offline capabilities and better compatibility through the use of exploring different options and strategies can lead to the improvement of the Alitaptap app.

V. Conclusion

Apps for learning management systems include all the elements required for teaching and learning, for both students and teachers. Despite an expansion in electronic learning technologies in recent years, children still lack learning motivation.. Alitaptap, being a learning management system (LMS) app, is different in the way that it is aimed toward elementary and preschool students. Alitaptap would be targeted at schools focusing on elementary education. One of its strong points is that it is built for children. Having something tailored for children may increase their performance to learn. It is designed so that the elementary students using the app will have an engaging experience when using the app. Moreover, Alitaptap enables offline content wherein students only need to download their lectures and tasks once per week andsubmit it anytime within the aforementioned, causing them to be able to manage their internet connections well, lessening the hindrance to quality education.

After disseminating the proper questionnaire that involves the six thinking hats strategy and conducting the product's SWOT Analysis and TOWS Matrix based on the distributed questionnaire, it can be concluded that the Alitaptap mobile app is deemed as a satisfactory LMS for elementary and preschool students that are currently in online classes. Its strengths come from its implementation of cartoonish images, color variety, offline capabilities, and overall implementation of features that can be located in other learning management systems as well, but this time the features are improvised for it to be child-friendly. With proper research, consultation with experts, and exploration of the different options for improving the app, the weaknesses and threats that are present in the product can be easily addressed. There is no question that one's education can be improved by using the Alitaptap Learning Management Application System. SWOT Analysis helps researchers better comprehend the problem, which makes data simulations easier overall and helps them develop a strategy that will produce a better result for the project. Based on the SWOT Analysis, the Alitaptap Learning management systems satisfy all the user's ideal learning environment experience with a minor drawback from its offline limitations, application size, and compatibility issue that limits the overall potential of the application. Overall, after conducting the SWOT Analysis, followed by the TOWS matrix, the Alitaptap app is a learning management system with great potential from which elementary and preschool students alike can truly benefit.

Conflict of Interest

The authors declare no conflict of interest.

Author Contributions

Grace Lorraine Intal reviewed and finalized the paper as to the required format.

Angelo Luisse Gonzales handled the data gathering and review of related studies.

Luis Angelo Pono worked on the SWOT and tows analysis.

Joseph Rex Pastrana worked on the analysis and conclusion.

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