



Development and Evaluation of Academic and Curriculum Management System for Secondary School

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Abstract. Academic and Curriculum Management System (SPAKP) is a system developed to help administrators and teachers to record and update students achievement in academic and cocurriculum in one platform. Parents and students can monitor the level of student achievement in the school. This study conducted to identify the important features in the system, develop a prototype of the Academic and Cocurriculum Management System for Students (SPAKP) and evaluate the level of usability of the system prototype among secondary school teachers. 45 respondents were randomly selected, consisting half from teachers at SMK Zone R1 Wangsa Maju, Kuala Lumpur. Quantitative approaches were used and data were collected through questionnaire instruments with Likert Five Scale. Data were analyzed using SPSS version 23 and descriptive statistics method. Descriptive analysis found that the system's prototype usability was high and positive with a mean value of 4.36 and a standard deviation of 0.64. This showed that the Academic and Cocurriculum Management System for Students (SPAKP) is well received by teachers and can be used for the future. This system can help teachers to update their student achievement in one system. The system can help parents to monitor the academic and cocurriculum achievement at the same time.

Keywords: Prototype · system · database · academic · co curriculum

1 Introduction

An Online Management Information Systems plays a vital role in today's environment due to the capability of increasing the efficiency and effectiveness of the organization. Various benefits were derived from the use of this online management information system. The education sector in Malaysia is no exception in using this innovation. Various types of online applications used in educational management in schools include Educational Management Information System (EMIS) Online, Student Database Application (APDM), Student Disciplinary Misconduct System (SSDM), School Examination Analysis System (SAPS) and Assessment Management System School Based (SPPBS). These five key applications are very important in helping teachers to manage data and information more efficiently and systematically (Aslina Saad, 2017). The database information

system involving secondary schools for academics and co-curriculum is the School Examination Analysis System (SAPS) and the Assessment of Physical Activity, Sports, and Co-curriculum (PAJSK).

The management of schools in Malaysia has become more complex. Therefore, Schools need to ensure their management is efficient and systematic in order to manage the human resources, accurate in performance appraisal and effective in decision-making. However, the administration that still operates manually will certainly face various problems (Aslina Saad, 2017). The School Examination Analysis System (SAPS) and the Secondary School Physical Activity, Sports and Co-Curriculum Assessment System (PAJSK) are currently separate. For the Physical Activity, Sports and Co-Curriculum Assessment System (PAJSK) is currently not accessible to parents, students but can only schools, and teachers were allowed to enter and generate marks and student reporting.

As the results, the prototype of the Student Academic and Co-curriculum Management System (SPAKP) in Secondary Schools was designed as a center collection, storage and analysis of internal assessment and examination data, as well as a data bank for the achievement scores of PAJSK, SEGAK and Co-curriculum of each Form 3 student throughout his schooling period. This aims to find out the development and achievement of students to complement other aspects of assessment in secondary school. This management system provides a centralized data center simultaneously for academics and co-curriculum to facilitate the Ministry of Education Malaysia, teachers and education practitioner throughout Malaysia in managing and monitoring the student achievement information. In addition, this system can facilitate parents and students themselves to know and monitor the development of academic performance and co-curriculum of students directly through this system. Therefore, the objective of the development and evaluation of this prototype of is to identify the features that need to be present in the academic information management database system and co-curriculum of students in secondary schools. Second, to develop a prototype of the Student Academic Management and Co-Curriculum System (SPAKP) and finally, to assess the level of usability of the prototype system among teachers in secondary schools.

2 Literature Review

Since 1997, when Education (National Curriculum) Regulations 1997 had been implemented The School Co-Curriculum Activities were recognised as part of the teaching and learning process. The importance of this activity is also equivalent to curriculum activities in the classroom because of its role as a contributor and complement to the teaching and learning of students as well as the formation of human capital (students) as a whole covering cognitive, affective and psychomotor aspects (MOE, 2017). In School-Based Assessment (SBA), the curriculum implemented in schools contains three dimensions, namely the Written Curriculum, teaching Curriculum and Curriculum. Assessment by using a formative and summative approach and methods (MOE, 2016).

2.1 The Development of Management Information System

Information System Development refers to the construction of computerized systems that process data to perform specific functions. Management Information System is a

system that applied to improve the efficiency of various task activities in the management and administration of an organization (Ermie, 2015). Online Information System is very important in education, especially in the process of entering and updating the latest information of students in school.

2.2 Database

Database is a collection of information stored in a computer systematically and can be accessed using a computer program to obtain information from the database (Yoga, 2019). Database can be built with special software that used to manage and call data arrays is called a Database Management System (DBMS). DBMS consists of two main components namely Relational Database Management System (RDBMS) and Overview of Database Management System (ODBMS).

2.3 Website

A website is a type of management information system that newly developed as an information reference. Teachers in schools have used various online SMPPs that can help facilitate their management in the planning and implementation of teaching and learning processes such as adapting Internet technology for student attendance systems, meeting room-booking systems, sports equipment inventory systems, student information systems etc. Currently, there are variety of technologies and equipment facilities to collect, organize and provide access to information easily compared to the past that deal with files and document. Many organizations solve management problems through electronic networks and many knowledge management systems used to undergo the changes or evolution in line with the development of Industrial Revolution 4.0 from search and call systems to more sophisticated artificial intelligence -based technologies, capable of user needs and preferences (Gaibreath, 2000). The Education Policy Planning and Research Division (BPPDP), MOE first introduced EMIS in 1996 and computerized information collection began in 1997. Basic educational information obtained from this well -managed information system is the most important information used for research and education planning development.

2.4 Education Management Information System (EMIS)

The development of technology growth rapidly today has led to significant changes in the field of management and administration. The Internet seem as a medium in effective delivery. Undoubtedly, the use of Information Communication Technology (ICT) is inevitable and ICT skills are indispensable to join the knowledge society (Oye, Iahad & Norzairan 2012). Therefore, the Multimedia Super Corridor Project (Multimedia Super Corridor or MSC for short) was announced by Tun Dr. Mahathir is in line to create a knowledge society as an effort to drive Malaysia's development towards achieving developed country status by 2020, Malaysia also did not miss the opportunity to integrate technology and communication (ICT) into the field of education. Therefore, work that previously done manually is now undergoing an evolutionary process where ICT

has transformed this work process with more sophisticated computing systems. In this era of information and communication technology (ICT), the Ministry of Education (MOE) put an effort to provide an efficient and systematic management system that implemented changes and introduced several innovations through online information system applications that replace existing information systems previously. Education Management Information System (EMIS) is an online information system used for the purpose of education management aimed at collecting, processing, storing, analyzing and disseminating information required in the Ministry of Education Malaysia.

However, this system needs to be further improvement by incorporating a database system that can be updated and accessed simultaneously for academics and co-curriculum. At the same time, provide an opportunity for parents in particular to know and monitor the development of their children's academic performance and co-curriculum through the system. Therefore, the proposed development of a prototype of the Student Academic Management System and Co-curriculum (SPAKP) in secondary schools was studied.

2.5 An Academic Management System and Co-Curriculum of Secondary School Students

Co-curriculum is educational activities that planned and implemented after formal lesson in classroom. According to the Courses of Study Regulations, Education Act 1956, defined the co-curriculum as an extra curriculum or extracurricular activities. However, the National Co-Curriculum Regulations under the Government Gazette, Education Act 1995, defined the co-curriculum as planned activities an extension of the teaching and learning process in the classroom that provide opportunities for students to add to, reinforce and practice knowledge, skills and values learned in the classroom. But academics can be defined as anything that is in nature and about knowledge.

The prototype of the Student Academic Management System and Co-curriculum in secondary schools was designed to function as a center for collecting, storing and analyzing internal assessment and examination data as well as a data bank for each student's PAJSK, SEGAK, and Co-curriculum achievement scores throughout the school period. This system will help teachers to track student progress and achievement and facilitates parents in order to monitor the development of their child's academic performance and co-curriculum directly. The development of this system is due to the fact that nowadays everything uses digital as the main pulse and in this era the emergence of the ocean of data approaching the terminology of Big Data (Agung Pujianto et al., 2018). Big Data refers to technologies and initiatives that involve data that is uniform, rapidly changing or so large in size that it is too difficult for conventional technology, expertise or infrastructure to deal with it effectively.

2.6 Theory of Application Development

In the application development process, the ADDIE design model was chosen to be a reference. The ADDIE model has five phases namely analysis, design, development, implementation and evaluation. In the analysis phase, the problems encountered need to be identified and find a solution. Problems can be identified through interviews,

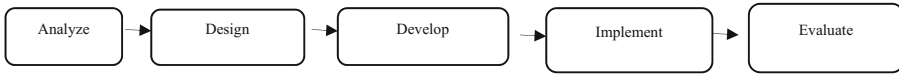


Fig. 1. ADDIE MODEL (1987)

observations, surveys and so on. Next, the causes and factors of the problem are identified. In the design phase, the process of transferring information from the analysis phase to the physical sketch takes place. Then, the development phase involves the process of producing software or applications based on a predefined design. The implementation phase involves the involvement of all key elements that have been designed to be applied into the software. Finally, a process of software testing and evaluation is required to ensure the effectiveness of appropriate content, graphics and interfaces. A summary of the phases is shown in Fig. 1

3 Research Methodology

The Secondary School Student Academic and Co-Curriculum Management System (SPAKP) developed through several important software, namely XAMPP, MySQL and Dreamweaver. This software being choose as a platform because of criteria as a latest software, easy to be used and the front page design that can be modified according to the developer's wishes. In turn, the system allows the teachers involved to enter student achievement scores either in academics or co-curriculum on a single platform. In addition, this website also allows the presentation of students' academic achievements and co-curriculum that can be accessed by student and their parents. Indirectly can increase the enthusiasm of students to continue to compete and strive.

3.1 Model and Theory Involved in Development Prototype

This ADDIE model was chosen to develop this prototype because a model design that emphasizes repetition was performed for each phase and interconnected with each other. If the phase cannot be implemented properly, the process can be repeated until it can be completely completed. In the needs analysis phase, the researcher conducted a study on the student management system that has been developed by other researchers before to get an idea of the shortcomings of the existing system. Therefore, the needs of this phase are important to identify and evaluate the needs of the things to be studied in order to determine the results to be achieved (McKillip 1987).

While the next phase of design and development the researcher sketched some things related to website design that is flow chart related to the sequence of activities, interface of each display in the portal, programming language board used to give instructions to each desired result based on the flow chart built. Once the sketch is done then the development process of this website begins by using the main software that is XAMPP, MySQL and Dreamweaver. According to Ahmad Zamzuri (2018) this aspect needs to be emphasized in this phase because it will produce an effective system (Figs. 2 and 3).

As for the implementation phase, this phase is the phase of implementing and testing the prototype that has been built to ensure that the objectives development and functionality of the website can be achieved. If there are shortcomings, weaknesses and errors

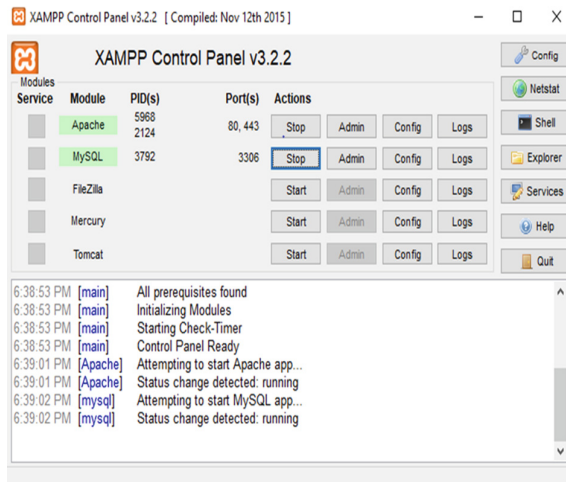


Fig. 2. Interface XAMPP Control Panel

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<?php
include 'config.php';
session_start();
ob_start();

$idpengguna = $_SESSION['id_pengguna'];
$katalaluan = $_SESSION['katalaluan'];

$_SESSION['id_pengguna']=$idpengguna;
$_SESSION['katalaluan']=$katalaluan;

$cek_status = mysql_query("SELECT * FROM login WHERE
idpengguna='$idpengguna' AND katalaluan='$katalaluan'");
$rowst = mysql_fetch_array($cek_status);
$spengguna = $rowst['idpengguna'];
$skatalaluan= $rowst['katalaluan'];

if($spengguna&&$skatalaluan){
?>

<style type="text/css">
@import url("cssmenu/menu_source/styles.css");
body {
background-color: #F2F2F2;
background-image: url(Capture.JPG);
}
body,td,th {
font-size: 18px;
color: #000000;
font-family: "Arial Black", gadget, sans-serif;
}
.footer {
font-size: 12px;
}
</style>
<table width="893" border="1" align="center">
<tr>

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Fig. 3. Coding Login Admin

then the researcher will make improvements on those aspects. After the improvements are made, then the final phase is the evaluation phase whereby the researcher conducts a testing process on the target users to evaluate the usability of the developed website.

Integrating the ADDIE model in educational software development, it has the potential to improve the performance and quality of the software developed. This seeks to make the development process more systematic and convincing.

3.2 Application Development Theory

In the context of the development of this prototype, the developer applied the elements of multimedia and three theories of teaching and learning namely the theory of constructivism, behaviorism, and cognitivism. The theory of constructivism in this prototype is space provided for teachers and parents to provide any questions and feedback to the admin and it acts as an element of social interaction created between the app developer with teachers and parents (questions, feedback, and suggestions). Next, the theory of behaviorism applied through the content of the system prototype that coincides with the needs of a developed system. This can help teachers to increase the level of access to the system and make it easier for them to update student achievement information. In addition, the theory of cognitivism implemented in the prototype of this system is such as the description of the interface, the use of text and colors and buttons to attract teachers and facilitate parents to access student achievement information.

3.3 Research Design

A survey study with a quantitative approach was used in this study. The researcher used a questionnaire instrument to obtain accurate descriptive data. Questionnaires are one of the popular and often used instruments to obtain information (Mohd Najib, 2003) the most practical and effective instrument in measuring the characteristics of the variables to be measured and suitable examine large populations.

3.4 Location, Population and Study Sample

This study was conducted among 45 teachers from Sekolah Menengah Kebangsaan Zone R1 Wangsa Maju, Kuala Lumpur. In this study, a simple random sampling method was selected. This is due to, this study only aims to test the level of usability of the system prototype and the teachers from the school are more accessible. Therefore, the researcher has distributed the questionnaire to 80 teachers in the schools involved as the number is the total population of teachers in the school, but only 45 teachers were able to answer the questionnaire given. Due to the small sample size in this study, it cannot be generalized to all teachers throughout Malaysia.

3.5 Research Instrument

All teachers involved will be given an initial explanation related to this study. Teachers were also asked to answer questions honestly and there were no right or wrong answers. Next, teachers were given a questionnaire form and required to answer within a specified time. The questionnaire contained 19 questions divided into four sections. In the demographics section, which is the first part, there are four questions that are asked related to gender, age, teaching experience and subjects taught. Next, in the second part of the system design, the researcher has submitted five questions related to the features of the system display. The third part also contains five questions related to the overall functionality of the system and the last part related to the usability of the system to admins and users. In this study, the researcher has constructed a questionnaire with Five Likert Scale

measurement. This measurement contains five scales namely Scale 1-Strongly Disagree, Scale 2-Disagree, Scale 3-Neutral, Scale 4-Agree and Scale 5-Strongly Agree.

Pilot Study and Item Reliability

The validity and reliability of the instrument in obtaining information and data is very important for a study. The higher the value of validity and reliability of the instrument, the higher and more accurate the data obtained to produce the best quality study. herefore, the questionnaire used was adapted from Kavin (2016). The data obtained were analyzed using SPSS software version 23. Cronbach's alpha coefficient was used to obtain the validity and internal reliability of the items.

Data Collection Procedures

Before distributing the questionnaire, the respondents of the study will be given a brief description related to the study conducted. The aim was for the study respondents to be calm and always ready to answer the questions posed. After that, all respondents were given a certain amount of time to answer. If there are any doubts and questions in the questionnaire, respondents can continue to ask the researcher. Overall, the time period required in the collection of study data was for one week.

Data Analysis

The data obtained from the survey study were analyzed in order to determine the accuracy of the data in achieving the objectives of the study. The data obtained from the questionnaire will be analyzed descriptively involving frequency and mean using SPSS software version 23. Descriptive analysis was used to show the main features of the data collection aimed at summarizing the sample. It also has a brief summary of the representative sample and the surveys that have been conducted (Uma Sekaran, 2013).

4 Findings

Based on the analysis table of the findings, it can be concluded that the usability aspect of this prototype is at a high level of 4.36. This can be seen through the total mean score between 4.33 to 4.42, this indicates that each aspect is assessed at a high level. All these aspects have been successfully implemented in the prototype of the developed system (Tables 1 and 2).

Based on the design construct, it was found that the teachers agreed with the design developed in the prototype of this system that is with an overall mean value of 4.34 and is

Table 1. Min Score of Each Construct

Construct	SD	Min Score	Level
Design	0.68	4.34	High
Function	0.65	4.30	High
Usability	0.58	4.42	High
Total	0.64	4.36	High

Table 2. Min score for design

NO	QUESTION	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE	MIN
B5	I feel the interface is interesting	0% (0)	0% (0)	11.1% (5)	51.1% (23)	37.8% (17)	4.53
B6	I feel the interface is easy to be understand	0% (0)	0% (0)	13.3% (6)	73.3% (33)	13.3% (6)	4.24
B7	The interface complete with function for admin, teacher and parents	0% (0)	0% (0)	11.1% (5)	68.9% (31)	20% (9)	4.28
B8	The system design is more systematic compare to previous application	0% (0)	0% (0)	4.4% (2)	66.7% (30)	28.9% (13)	4.30
B9	I satisfied with overall of design in this system	0% (0)	0% (0)	8.9% (4)	57.8% (26)	33.3% (15)	4.35

at a high level. In the process of system development, the design aspect is very important to ensure maximum effectiveness of the software used which aims to help the process of entering all the data and accessibility to the system (Peters 2014; Norfadilah 2010). Therefore, system developers should design interfaces based on theories or models in related and appropriate fields and not based on desire alone (Table 3).

While from the aspect of function, the developed system can function well as the basic requirements of a system that has been set with the mean achievement also at a high (4.30). Hasnah (2006) stressed that a software or system developed must meet the needs of users so that the system is easily accessible (Table 4).

In testing the usability construct, the mean value achieved was 4.42 and was at a high level. Mohd Aliff et al. (2013) stated that feedback from users is positive when the website built has good usability features. The development of an attractive and easily accessible system is very important to make it easier for administrators and teachers to

Table 3. Mean Score for function

NO	QUESTION	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE	MIN
C10	The system has complete function	0% (0)	0% (0)	8.9% (40)	66.7% (30)	24.4% (11)	4.24
C11	I able to access the system as teachers as well as parent	0% (0)	0% (0)	8.9% (4)	66.7% (30)	24.4% (11)	4.24
C12	The system appear about appear student's the academic and co-curriculum achievement	0% (0)	0% (0)	11.1% (5)	68.9% (31)	20% (9)	4.20
C13	I able to key in student's data, view and update the student achieve the same time	0% (0)	0% (0)	20% (9)	48.9% (22)	31.1% (14)	4.52
C14	I satisfied with overall facilities in this system	0% (0)	0% (0)	8.9% (4)	62.2% (28)	28.9% (13)	4.30

enter data and update existing data as well as facilitate access for parents to monitor children's achievement in academics and co-curriculum.

Therefore, the findings of the study indicate that all three objectives of the study have been achieved by the researcher. First, the features that need to be present in the Academic Management System and Student Co-curriculum (SPAKP) in secondary schools have been identified in terms of design, function, display and also usability. Second, a prototype of the Student Academic Management and Co-Curriculum System (SPAKP) was developed and finally, the level of usability of the prototype of the system among teachers in secondary schools was evaluated.

Table 4. Min score for usability

NO	Question	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE	MIN
D15	The system is comprehensive	0% (0)	0% (0)	8.9% (4)	64.4% (29)	26.7% (12)	4.53
D16	The system help me to do my tasks.	0% (0)	0% (0)	20% (9)	66.7% (30)	13.3% (6)	4.30
D17	Information on interface is easy to be understand	0% (0)	0% (0)	15.6% (7)	64.4% (29)	20% (9)	4.40
D18	I more comfortable to use this system compare to previous	0% (0)	0% (0)	15.6% (7)	53.3% (24)	31.1% (14)	4.57
D19	I satisfied with overall function in this	0% (0)	0% (0)	17.8% (8)	68.9% (31)	13.3% (6)	4.30

5 Discussion

The use of this system is very appropriate and effective because it can help teachers record and update student data on the same system while facilitating parents to monitor their children's achievement in academics and co-curriculum in school. In addition, the system has the complete features that are necessary for a database of student achievement information in schools. It is also very important to make it easier for parents and students to access academic achievement and co-curriculum in school. Based on the findings of the study, it is clear that the development of the prototype of this system has reached the level of usability of the system by emphasizing the evaluation of three main aspects, namely in terms of design, functionality and usability. In comparison, the existing student information management database systems such as the School Examination Analysis System (SAPS) and the Physical Activity, Sports and Co-Curriculum Assessment System (PAJSK) are on separate platforms and for the PAJSK system are not accessible by parents.

Although this prototype system considered meeting the level of usability, but this prototype is only focused on Form 3 students. Therefore, still room for improvement to make sure this system are more useable to all secondary school students. In addition, the respondents of this study only involved some teachers from SMK Zone R1 Wangsa Maju as a pilot study in testing the effectiveness of the system. Therefore, it is recommended that further researchers be able to test this system among parent and student and add more data in the system to help teachers record and update student achievement efficiently.

6 Conclusion

Based on the findings, the teachers agreed with the features in the development of the prototype of the Academic Management System and Student Co-curriculum (SPAKP). This is based on the features found in the system such as design, display, functionality and level of usability. In conclusion, all parties, especially administrators, teachers and parents need to further increase the level of access to the system and at the same time be able to assess the shortcomings in the system. This, can help researchers to improve the usability of the system in the future.

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