

## ACCEPTABILITY OF AUTOMATED INSTRUCTION DOCUMENT - SYLLABUS MANAGEMENT SYSTEM BASED ON TECHNOLOGY ACCEPTANCE MODEL

Meralei J. Lawas<sup>1</sup>, Jocelyn A. Abojon<sup>2</sup>, Janice A. Alivio<sup>3</sup>,

Lelanie S. Cordero<sup>4</sup>, Joseph C. Pepito<sup>5</sup>

Assistant Professor 3, Mechatronics and Graphics Design Department, Cebu Technological  
University-Main Campus

Assistant Professor 1, Mechatronics and Graphics Design Department, Cebu Technological  
University-Main Campus

Associate Professor 5, Mechatronics and Graphics Design Department, Cebu Technological  
University-Main Campus

Associate Professor 2, Mechatronics and Graphics Design Department, Cebu Technological  
University-Main Campus

Associate Professor 5, Mechatronics and Graphics Design Department, Cebu  
Technological  
University-Main Campus

**Abstract** - *This study assessed the status of the current instruction document – syllabus management system of Cebu Technological University-Main Campus, Cebu, Philippines, and identified the information related to the developed system as the basis for the acceptability of the Automated Instruction Document – Syllabus Management System. It is descriptive developmental research that utilizes survey questionnaires and content analysis. There were 43 respondents, including the faculty, chairperson, and dean, which will be the basis for accepting the developed Automated Instruction Document-Syllabus Management System. Moreover, Weighted Mean, Average Weighted Mean, and ANOVA test statistics were used as data treatment. The study revealed that the university needs an information system focusing on instruction document-syllabus management, specifically the Automated Instruction Document- Syllabus Management System (AID-SMS). The university should implement this management system for electronic acquisition and retrieval, storage, monitoring, and evaluation of instruction documents for fast, easy, and centralized processing. Furthermore, this will provide a better user experience, smooth navigation, and simplified processes to the faculty instruction documents or syllabus.*

**Keywords:** *Technology Management, Automated Instruction Document-Syllabus Management System, Descriptive-Developmental Research,*

### Introduction

Information Communication and Technology (ICT) contributes significantly to the rapid transformation of a global society (A. Porba et al., 2015). With the significant growth in electronic education materials such as syllabus documents and lecture notes available on the

Internet and intranets, there is a need for developing structured central repositories of such materials to allow both educators and learners to easily share, search, and access (A.Joorabchi et al., 2009). Hyunsook et al. (2015) averred that the syllabus is an essential entity as a skeleton of a course. However, most syllabuses only organize general information about the course, like title, description, instructor, grading policy, textbook, schedule, and so on. However, (X.Yu et al., 2008) stated that gathering and building a repository of syllabi is complicated by the unstructured nature of the syllabus representation and the lack of a unified vocabulary for syllabus construction.

A study in Ireland by A. Joorabachi, 2008, stated that a national syllabus repository for course syllabi for a given country needs to provide a rich collection of syllabi in a wide range of disciplines to attract the attention of all concerned in the higher education institutions in that country, motivating them to put in additional efforts to add to their new syllabi to the repository and keep the existing ones up-to-date. In addition, a study in Malaysia by Chelvarayan, A., Jayothisa et al. (2011) mentioned that a syllabus management system helps create and manage the knowledge management practice and share knowledge among academics.

In the Philippines, Lucero, C., 2018 reiterated in his study that Institutions like De La Salle University build up their capacity to generate comprehensive, high-quality data and information to support strategic planning and decision-making to provide meaningful, comparative information about institutional performance to administrators, accrediting agencies and the public. In Cebu, considering that Cebu Technological University has a total of 10 satellite campuses, it complies with the top accreditation bodies such as the Commission on Higher Education (CHED), Accrediting Agency for Chartered Colleges and Universities of the Philippines (AACUP) and TUV for ISO 9001-2015. Recent findings of TUV show that no automated syllabus management system existed in the university, resulting in non-uniformity and comparison of the students from different campuses. And the faculty's existing practice in the university-wide acquisition and retrieval of syllabi is still in the form of hardcopy or the traditional way of submission and retrieval.

Thus, this prompted the researcher to develop an automated instruction document - syllabus management system. This system will systematically process the requisition and retrieval of faculty syllabi, storage, monitoring, and evaluation. Hence, in compliance with the specifications and requirements of the university.

## **Methods and Materials**

The descriptive-developmental approach of research was used for this study. A modified version of Davis' (1986) Technology Acceptance Model questionnaire is employed to collect data for the system's development. Analysis and data collection was used to build and develop the system. Likewise, the Unified Modeling Language (UML), a visual modeling tool, and notation was used in the system's design to specify, model, and document component-based and object-oriented system architectures.

The study participants were randomly picked; these are the people who directly interact with the syllabus management. These are the Deans, Chairpersons, and the Faculty.

The second group is the faculty which consists of full-time instructors since full time. Moreover, the survey was carried out at Cebu Technological University's Main Campus.

Furthermore, the primary method for data collection is a modified version of the Davis Technology Acceptance Model questionnaire. Three sections of the questionnaire address the status of the syllabus management system, the development of the system's features and design, and its acceptability.

### Results and Discussion

The researcher gathered data on how respondents saw the system for the study to determine the level of acceptability of the established automated instruction document-syllabus management system. In this section, the researcher categorizes the respondent groups' perceptions based on the Technology Acceptance Model, such as usefulness, ease of use, behavioral intention to use, and actual system use.

Table 1-4 revealed that documenting instruction documents is one of the significant areas in the Automated Instruction Document- Syllabus Management System. It is indeed necessary to experience not only its functionality but also the features that surround it. The result also showed four salient features of the AID-SMS: Usefulness, Ease of Use, Behavioral Intention to Use, and Actual Use of the System.

#### Perceived Usefulness

This section discusses the respondent groups' acceptance of the developed Automated Instruction Document- Syllabus Management System based on the Technology Acceptance Model (TAM). Table 1 presents whether the respondents find the system acceptable in terms of usefulness in data acquisition, data storage, monitoring and tracking data, and data proficiency for future evaluation.

**Table 1. Acceptability of the Automated Instruction Document-Syllabus Management System Design Based on the Technology Acceptance Model as to Perceived Usefulness.**

PERCEIVED USEFULNESS	Dean	Chairperson	Faculty	OVERALL	
	- x	- x	- x	- x	Verbal Description
1. Using SMS would increase the efficiency in acquiring data.	4.00	3.67	3.66	3.77	Strongly Agree
2. The SMS allows me to find the data stored in the system.	4.00	3.67	3.69	3.78	Strongly Agree
3. The SMS would make tracking and monitoring the syllabus easier.	4.00	3.67	3.69	3.78	Strongly Agree

4. The SMS would allow me to acquire and retrieve the approved syllabus immediately.	4.00	3.83	3.71	3.85	Strongly Agree
5. The SMS would be useful for evaluation.	4.00	3.83	3.77	3.87	Strongly Agree
<b>Average Mean</b>				<b>3.81</b>	<b>Strongly Agree</b>

**Legend:**

3.26 - 4:00 *Strongly Agree (SA)*      2.51 – 3.25 *Agree (A)*  
 1.76 – 2.50 *Strongly Disagree (SD)*      1.0 – 1.75 *Disagree (D)*

As shown in Table 1. the result indicates that respondent groups prefer useful for evaluation, which has an average mean of 3.87, and easy retrieval of teaching documents or the syllabus, which has an average mean of 3.85. The total average weighted mean is 3.81 with a verbal description of strongly agree. This specifies that respondents would prefer a convenient, engaging, and informative information system. According to Smith and Mosier (2015), standard formatting and templates are required to ease the user from remembering and specifying suitable formats, achieving user-friendliness in the interaction.

**PERCEIVED EASE OF USE**

The perceived ease of use is the second component of the acceptability of the developed Automated Instruction Document- Syllabus Management System based on the Technology Acceptance Model (TAM). As projected in Table 2, it emphasizes the acceptability of the system's usability as to its system utilization, clear and intuitive user interface, system dynamics, and system flexibility.

**Table 2. Acceptability of the Automated Instruction Document-Syllabus Management System Design Based on the Technology Acceptance Model as to Perceived Ease of Use.**

PERCEIVED EASE OF USE	Dean - x	Chairperson - x	Faculty - x	OVERALL	
				- x	Verbal Description
1. Learning to operate the SMS would be easy for me.	4.00	3.67	3.66	3.77	Strongly Agree
2. I would easily find the information I am looking for using the SMS.	4.00	3.67	3.60	3.76	Strongly Agree

3. I would find the user interface of the SMS clear and intuitive.	4.00	3.50	3.43	3.64	Strongly Agree
4. I would find the SMS to be flexible to interact with thru its easy update buttons.	4.00	3.50	3.43	3.64	Strongly Agree
5. I would find the SMS easy to use (user-friendly) especially during downloading and uploading of syllabus.	4.00	3.67	3.60	3.76	Strongly Agree
<b>Average Mean</b>				<b>3.71</b>	<b>Strongly Agree</b>

This area shows an average weighted mean of 3.71 for perceived ease of use with a verbal description of Strongly Agree. This suggests that creating an information system with a user-friendly environment is one of the factors that makes the end-user continuously use the system. According to Medina-Ortiz., Contreras, Quiroz, Asenjo, & Olivera-Nappa, (2020), the use of computational tools for data analysis is increasingly required, given the need to extract meaningful information from such large volumes of data. However, no free access libraries, modules, or web services comprise a vast array of analytical techniques in a user-friendly environment for non-specific users. Allen, Bruno, Smythe, Will, & Woods, E. (2016), mentioned that, "With the increased usage of computing networks, such as the Internet, humans are currently inundated and overwhelmed with the amount of information available to them from various structured and unstructured sources. However, information gaps abound as users try to piece together what they can find that they believe to be relevant during searches for information on various subjects."

#### **BEHAVIORAL INTENTION TO USE**

The behavioral intention to use is the third component of the Technology Acceptance Model (TAM). It assesses the respondent groups' acceptance of the established Automated Instruction Document-Syllabus Management System. It examines whether the respondents thoroughly comprehend the system's operation. As indicated in Table 3, respondents accept that the Automated Instruction Document- Syllabus Management System protects users' privacy and is dependable, risk-free, and manageable.

**Table 3. Acceptability of the Automated Instruction Document-Syllabus Management System Design Based on the Technology Acceptance Model as to Behavioral Intention to Use.**

BEHAVIORAL INTENTION TO USE	Dean - x	Chairperson - x	Faculty - x	OVERALL	
				- x	Verbal Description
1. I have a clear conception of the functionality of the SMS.	4.00	3.67	3.71	3.79	Strongly Agree
2. The SMS protects the privacy of its users.	4.00	3.67	3.49	3.72	Strongly Agree
3. I feel confident that the SMS is reliable.	4.00	3.67	3.51	3.73	Strongly Agree
4. I believe it is risk-free to use the SMS.	4.00	3.50	3.31	3.60	Strongly Agree
5. I feel confident that I can keep the SMS under control.	4.00	3.67	3.51	3.73	Strongly Agree
<b>Average Mean</b>			<b>Weighted</b>	<b>3.71</b>	<b>Strongly Agree</b>

According to the table, respondents strongly agreed, with an average weighted mean of 3.71. This implies that they have a clear knowledge or notion of the functioning of the developed system, as well as because of its user-friendly environment; as a result, the respondents are completely aware of its function and can freely explore its various processes. As said by Almazán, Tovar & Quintero (2017), information systems are one of the most relevant components of the current business environment. They offer great opportunities for success for the companies, given that they have the capability of collecting, processing, distributing, and sharing data in an integrated and timely manner. However, these advantages make the organizations more dependable on the IS to carry out their day-to-day activities (Gómez & Suárez, 2012), which forces them to invest more in this type of technology (Petter, DeLone, & McLean, 2008).

#### ACTUAL SYSTEM USE

The actual system of use is the fourth component of the TAM, which is utilized to assess the acceptability of the produced Automated Instruction Document- Syllabus Management System from the respondent's perception. It accepts the respondent's acceptance regarding the capacity to utilize the Automated Instruction Document- Syllabus Management System, including the enjoyment and benefit of knowing how to use the system, as indicated in Table 4.

**Table 4. Acceptability of the Automated Instruction Document-Syllabus Management System Design Based on the Technology Acceptance Model as to Actual System Use.**

ACTUAL SYSTEM USE	Dean	Chairperson	Faculty	OVERALL	
	- x	- x	- x	- x	Verbal Description
1. I am capable of using SMS.	4.00	3.83	3.71	3.85	Strongly Agree
2. I have fun using SMS.	4.00	3.50	3.46	3.65	Strongly Agree
3. Using SMS gives me an advantage over those who don't.	4.00	3.67	3.51	3.73	Strongly Agree
4. I find it rewarding to use SMS.	4.00	3.67	3.51	3.73	Strongly Agree
5. Using SMS is a good idea.	4.00	3.83	3.66	3.83	Strongly Agree
<b>Average Weighted Mean</b>				<b>3.76</b>	<b>Strongly Agree</b>

The capability of using the designed system, AID-SMS, is an area where respondents strongly agreed on its acceptability, with a weighted mean of 3.85 or strongly agree. Thus, the total average weighted mean of the fourth component is 3.76, meaning respondents strongly agree. This implies that the majority of respondents could optimize their usage of the AID-SMS due to its user-friendly environment, as they immediately understood its features and found it beneficial, allowing them to explore it freely.

According to Demian Abrego Almazán, Yesenia Sánchez Tovar, José M. Medina Quintero,(2017), IS can be defined as the group of elements focused on processing, administering, and disseminating data and information, organized and ready for their subsequent use, generated to cover an organizational need. The same ideas was also posed by Davis and Olson (1985), Andreu, Ricart, and Valor (1996), Haag and Cummings (2013), and Turban et al. (2013).

#### **SUMMARY OF ACCEPTABILITY**

Table 5 below revealed the summary of respondent's acceptability of the developed of the Automated Instruction Document- Syllabus Management System. It also emphasized that documenting instruction documents is one of the significant areas in the system. Thus, it is indeed necessary to experience not only its functionality but also the features that surround

it. The result also showed four salient features of the AID-SMS: Usefulness, Ease of Use, Behavioral Intention to Use, and Actual Use of the System.

**Table 5. Summary of Acceptability of the Automated Instruction Document-Syllabus Management System Design Based on the Technology Acceptance Model.**

TAM Constructs	Dean	Chairperson	Faculty	OVERALL	
	- x	- x	- x	- x	Verbal Description
1. Perceived Usefulness	4.00	3.73	3.70	3.81	Strongly Agree
2. Perceived Ease of Use	4.00	3.60	3.54	3.71	Strongly Agree
3. Behavioral Intention to Use	4.00	3.64	3.51	3.71	Strongly Agree
4. Actual System Use	4.00	3.70	3.57	3.76	Strongly Agree
<b>Average Weighted Mean</b>	<b>4.00</b>	<b>3.67</b>	<b>3.58</b>	<b>3.75</b>	<b>Strongly Agree</b>
<b>Standard Deviation</b>	<b>0.00</b>	<b>0.10</b>	<b>0.12</b>	<b>0.09</b>	

Based on the technology acceptance model, the average weighted score is 3.75 with a standard deviation of 0.09, indicating that respondents agree with the acceptability of the Automated Instruction Document- Syllabus Management System.

According to Anushia Chelvarayan, et. al (2011) that "A Document Management System like Syllabus Management Systems allows users to track and manage documents across work groups which include handling critical information assets such as lecturer's teaching background, subject learning outcomes and programme outcomes. However, as mentioned by (Lucero, C., 2018) while this can be a time-consuming process, the freedom that comes along with moving away from paper is more than worth the extra effort, and the process also allows Quality Assurance Office to pick and choose which documents to hold on to and which can be eliminated; (4) Save time, allows quicker access to documents when needed; and (5) Regular progress reporting creates a valuable written record of the programs' life.

Moreover, the gathered data were processed further to determine if there is a significant relationship between perceived usefulness, perceived ease of use, behavioral intention to use, and actual system use as perceived by the respondents. ANOVA Test is utilized to determine if survey or experiment results have significant difference at significant level 0.05. Table 8 - 11 illustrates the tabulated data on the perception of the perceived usefulness, perceived ease of use, behavioral intention to use, and actual system. The following are the details of the hypothesis testing.



### Null Hypothesis ( $H_0$ )

There is a significant difference between the respondents' perceptions of perceived usefulness, perceived ease of use, behavioral intention, and actual system use.

If the P-Value is greater than alpha which is 0.05 then it is accepted.

If the P-Value is smaller than alpha which is 0.05 then it is rejected.

**Table 6. ANOVA Test on Perceived Usefulness**

ANOVA: Single Factor

#### SUMMARY

Groups	Count	Sum	Average	Variance
Faculty	5	18.51429	3.70285714	0.001878
Chairperson	5	18.66667	3.73333333	0.008333
Dean	5	20	4	0

ANOVA

Source of Variation	SS	df	MS	F	P-value	F critical
Between Groups	0.267223	2	0.13361149	39.25561	5.43E-06	3.885294
Within Groups	0.040844	12	0.00340363			
Total	0.308067	14				

**Result: Insignificant**

### $H_0$ : ACCEPTED

Using the ANOVA test statistic to determine the significant difference between the AIDSMS perceived usefulness as perceived by the respondents. The result revealed that the computed P-value = 5.43E-06 at a level of significance at

0.05. The result concluded that computed P-value is greater than alpha which is 0.05 as seen on Table 6 above. Therefore, the null hypothesis is accepted. There is no significant difference between AID-SMS perceived usefulness as perceived by the respondents. Thus, no sufficient evidence to prove that the null hypothesis is false.

**Table 7. ANOVA Test on Perceived Ease of Use**

ANOVA: Single Factor

#### SUMMARY

Groups	Count	Sum	Average	Variance
Faculty	5	17.71429	3.542857	0.011429

Chairperson	5	18	3.6	0.008333
Dean	5	20	4	0

ANOVA

Source of Variation	SS	df	MS	F	P-value	F critical
Between Groups	0.620408	2	0.310204	47.09122	2.08E-06	3.885294
Within Groups	0.079048	12	0.006587			
Total	0.699456	14				

**Result: Insignificant**

**H<sub>0</sub>: ACCEPTED**

Applying the ANOVA test statistic to determine the significant difference between the AID-SMS perceived ease of use as perceived by the respondents. Table 7 reflected that the computed P-value = 2.08E-06 at a level of significance at 0.05. The result concluded that computed P-value is greater than alpha which is 0.05. Therefore, the null hypothesis is accepted. Likewise, there is no significant difference between AID-SMS perceived ease of use as perceived by the respondents. Hence, there is no sufficient evidence to prove that the null hypothesis is false.

**Table 8. ANOVA Test on Behavioral Intention to Use**

ANOVA: Single Factor

SUMMARY

Groups	Count	Sum	Average	Variance
Faculty	5	17.54286	3.508571	0.020163
Chairperson	5	18.16667	3.633333	0.005556
Dean	5	20	4	0

ANOVA

Source of Variation	SS	df	MS	F	P-value	F critical
Between Groups	0.65252	2	0.32626	38.05696	6.38E-06	3.885294
Within Groups	0.102875	12	0.008573			
Total	0.755395	14				

**Result: Insignificant**

**H<sub>0</sub>: ACCEPTED**

Utilizing the ANOVA test statistic to determine the significant difference between the AID-SMS behavioral intention to use as perceived by the respondents. Table 8 illustrates that the computed P-value = 6.38E-06 at a level of significance at 0.05. The result concluded that computed P-value is greater than alpha which is 0.05. Therefore, the null hypothesis is accepted. Therefore, no significant difference between AID-SMS behavioral intention to use as perceived by the respondents. There is no sufficient evidence to prove that the null hypothesis is false.

**Table 9. ANOVA Test on Actual System Use**

ANOVA: Single Factor

SUMMARY

<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>
Faculty	5	17.85714	3.571429	0.011837
Chairperson	5	18.5	3.7	0.019444
Dean	5	20	4	0

ANOVA

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F critical</i>
Between Groups	0.483673	2	0.241837	23.19319	7.54E-05	3.885294
Within Groups	0.125125	12	0.010427			
Total	0.608798	14				

**Result: Insignificant**

**H<sub>0</sub>: ACCEPTED**

Employing the ANOVA test statistic to determine the significant difference between the AID-SMS perceived ease of use as perceived by the respondents. Table 9 illustrates that the computed P-value = 7.54E-05 at a level of significance at 0.05. The result concluded that computed P-value is greater than alpha which is 0.05. Therefore, the null hypothesis is accepted. Therefore, no significant difference between AID-SMS behavioral intention to use as perceived by the respondents. There is no sufficient evidence to prove that the null hypothesis is false.

Granting the perception of the respondent groups along the AID-SMS is highly accepted, the reality is that a new work setting will be changed if an Information System will be utilized is still an issue. Lack of confidence and training in the implementation of ICT may be the case.

As reiterated by Nigel H. Lovell, Farah Magrabi et. al., (May/ June 2001), the advantages associated with a web interface include familiarity with browser design and navigation (for the user), as well as the ability to rapidly customize interfaces for particular requirements (for the programmer). Likewise, Traditional human computer interfaces have emphasized uniformity and consistency; thus, experienced users had a shortened learning curve for use of software and systems, while novice users often required extensive instruction before profitable use of a system as Szabo, A. J. (2010) mentioned.

According to Ashby (2011), "Going paperless requires a great deal of planning and progressive transition. Thinking that the paperless journey will be fast and easy will only lead to frustration". Moreover, she added that employees must receive training and learns new skills. Time is indeed of the essence because organizations would need enough time to implement the new system one at a time. Nevertheless, parallel implementation would be a smart strategy in slowly implementing the technology-based process.

## Conclusion

Based on the study's findings, it can be concluded that the Cebu Technology University – Main Campus needs an information system focused on instruction document management for the faculty syllabus, specifically the Automated Instruction Document- Syllabus Management System (AID-SMS). The existing instruction document-syllabus management system was paper-based and manual based in acquiring and retrieving, storing, monitoring, and evaluating processes. The study also showed the requirements needed for the development of the system. Likewise, it illustrated the acceptability of the system design implementation. And also, the study revealed no significant difference between the perception of the respondent groups on the acceptability of the automated instruction document-syllabus management system.

## References

1. Almazán, D. A., Tovar, Y. S., & Quintero, J. M. M. (2017). Influence of information systems on organizational results. *Contaduría y Administración*, 62(2), 321-338. 15.
2. Hassan, M. S., & Bhatti, A. M. (2016). Web-based System for Assessment and Continuous Improvement. *International Journal of Computer Applications*, 141(14).
3. Camarero, R., Fortin, C., Huet, G., Raynauld, J., & Gerbé, O. (2009, March). XML-based Course Syllabi-An Electronic Implementation of the CDIO Syllabus. In *International Conference on Computer Supported Education* (Vol. 1, pp. 160-165). SCITEPRESS.
4. Chelvarayan, A., Jayothisa, C. M., Hashim, H., & Lajis, K. N. (2011). Syllabus Management System for Academics Practicing Knowledge Management. *Journal of Organizational Knowledge Management*, 2011, g1-11.
5. Chung, H. S., & Kim, J. M. (2014, September). Semantic model of syllabus and learning ontology for intelligent learning system. In *International Conference on Computational Collective Intelligence* (pp. 175-183). Springer, Cham.
6. Cole, J., & Foster, H. (2007). Using Moodle: Teaching with the popular open source course management system. " O'Reilly Media, Inc."

6. Crispi, E. L., & Stivers, J. (2015). The syllabus re-imagined: From paper to website. *Syllabus*, 4(2).
7. DU, L. J., & JU, H. J. (2014). Design and Implementation of Syllabus Management System Based on Campus Network. *Journal of North China Institute of Science and Technology*, (9), 24.
8. Gómez, B. S. (2012). Violencia filio-parental: Aproximación a un fenómeno emergente. *Revista de humanidades y ciencias sociales*, (11), 73-107.
9. Gerbé, O., & Raynauld, J. (2009, June). An open syllabus model. In *EdMedia+ Innovate Learning* (pp. 4200-4209). Association for the Advancement of Computing in Education (AACE).
10. Hassan, M. S., & Bhatti, A. M. (2016). Web-based System for Assessment and Continuous Improvement. *International Journal of Computer Applications*, 141(14).
11. Ida, M., Nozawa, T., Yoshikane, F., Miyazaki, K., & Kita, H. (2005, February). Syllabus database and web service on higher education. In *The 7th International Conference on Advanced Communication Technology, 2005, ICACT 2005*. (Vol. 1, pp. 415-418). IEEE.
12. Kim, Y., & Ekachai, D. G. (2020). Exploring the Effects of Different Online Syllabus Formats on Student Engagement and Course-Taking Intentions. *College Teaching*, 68(4), 176-186.
13. Lovell, N. H., Magrabi, F., Celler, B. G., Huynh, K., & Garsden, H. (2001). Web-based acquisition, storage, and retrieval of biomedical signals. *IEEE Engineering in Medicine and Biology Magazine*, 20(3), 38-44.
14. Lim, L. P. (2004). *Syllabus Management System (SMS)/Lim Lay Poh* (Doctoral dissertation, University of Malaya).
15. Medina-Ortiz, D., Contreras, S., Quiroz, C., Asenjo, J. A., & Olivera-Nappa, Á. (2020). DMAKit: A user-friendly web platform for bringing state-of-the-art data analysis techniques to non-specific users. *Information Systems*, 101557.
16. Mosharraf, M., & Taghiyareh, F. (2019). Automatic Syllabus-Oriented Remixing of Open Educational Resources Using Agent-Based Modeling. *IEEE Transactions on Learning Technologies*.
17. O'Brien, J. G., Millis, B. J., & Cohen, M. W. (2009). *The course syllabus: A learningcentered approach* (Vol. 135). John Wiley & Sons.
18. Odeh, A. H., & Odeh, H. A. (2019). An Online Course File Management System (OCFMS). *International Journal of Simulation: Systems, Science & Technology*, 20(2), 9-1.
19. Petter, S., DeLone, W., & McLean, E. (2008). Measuring information systems success: models, dimensions, measures, and interrelationships. *European journal of information systems*, 17(3), 236-263.
20. Szabo, A. J. (2010). U.S. Patent No. 7,801,896. Washington, DC: U.S. Patent and Trademark Office.
21. Ta'a, A., & Abdullah, G. M. A. (2019). Course syllabus ontology for supporting elearning program.
22. Tungare, M., Yu, X., Cameron, W., Teng, G., Pérez-Quiñones, M. A., Cassel, L., ... & Fox, E. A. (2007, March). Towards a syllabus repository for computer science courses.

In Proceedings of the 38th SIGCSE technical symposium on Computer science education (pp. 55-59).

23. Woods, A. F., Luke, A., & Weir, K. (2010). Curriculum and syllabus design. In International encyclopedia of education (pp. 362-367). Elsevier.
24. Vizer, A. (2002). U.S. Patent Application No. 09/897,959.