Design and Development of a Syllabus Template System - A Syllabus Management Tool

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Abstract - *The syllabus is an important resource for academic information. It is a document to communicate the course design to the students. It serves as a guide of the faculty in the delivery of instructions in the classroom. The traditional syllabi-creation process is accomplished using a desktop application such as MS Word Processing, which consumed much of time to conform to institutional format particularly on the syllabus content.The study generally aimed to design and develop Syllabus Template System-a Syllabus Management Tool. Specifically, the system is designed to provide usable and efficient different modules like the File, Maintenance and Faculty which considered embedment of the predefined items in a direct template of a particular program/course. This direct template is designed in conformity to the ISO requirement in the uniformity of forms. The system's study observed developmental design with the concepts behind the System Development Life Cycle (SDLC), particularly, Agile methodology.There were 50 selected faculty who answered the questionnaire. Generally, the system was evaluated as usable as designed and highly efficient for use in the academic institution. It functioned as expected with its defined modules having predefined items on its template. The syllabus template conformed to ISO form. Since the present system's development is an independent stand-alone system by individual faculty's computer, conduct further studies and make it a Cloud-based system. Extend the system's capabilities to other HEIs for them take advantage of this management tool for well-structured syllabus requirements and the present system's widely used. The realization of the study is an indicator of creating a Sustainable Working Environment with Resilient Faculty towards subject syllabus requirements.*

Keywords: *Agile Methodology, CHED and ISO requirements, Development and Evaluation, and Syllabus Template Management Tool*

INTRODUCTION

The syllabus is an important resource for academic information. It is a document to communicate the course design to the students. It serves as a guide of the faculty in the delivery of instructions in the classroom. The traditional syllabi-creation process is accomplished using a desktop application such as MS Word Processing, which consumed much of time to conform to institutional format particularly on the syllabus content. The process gave much difficulty to the faculty, especially they are required for a syllabus of the subjects they are handling every term. Generally, faculty could submit the syllabus very late.The syllabus of the faculty is one of the important requirements of the accrediting bodies during accreditation and evaluation from different evaluating agencies particularly CHED to the Higher Educations Institutions (HEIs). CHED evaluation on the syllabus, in particular, verifies primarily if the course content, in general, is aligned with the standards as required by the subject/course. CHED requires monitoring and evaluation services to ensure program quality. CMO [1], elaborated that HEIs shall exercise academic freedom in its curriculum offerings but must comply with the minimum requirements for specific academic programs. The minimum standards are expressed as a minimum set of desired program outcomes. Moosavian [2] said that the syllabus is essentially a concise outline of a course of study, and conventionally a text document. Aldous and He [3], emphasized that a well-designed syllabus provides students with a roadmap for an engaging and

successful learning experience, whereas a poorly designed syllabus impedes communication between faculty and students, increases student anxiety and potential complaints, and reduces overall teaching effectiveness.

These days, some faculty members of different HEIs have major concerns with the institutional requirements on the syllabus. Currently, the syllabi-creation process is accomplished using a desktop application such as MS Word Processing. It consumed much of the time to conform to the institutional format and its required content. The process gave much difficulty to the faculty members, especially they are required for a syllabus of the subjects they are handling every term. This difficulty was confirmed in the study of Abdous and He [3], when they introduced the first two approaches in the syllabi creation process which were done using desktop applications like the word processing applications such as Microsoft Word, WordPerfect, or in some cases, LaTeX, to create course syllabi. Another is the HTML authoring applications such as Dreamweaver and FrontPage. One of the general strategies in the study of Davis [4], emphasized that if the course is new to the faculty but has been offered before, they have talked with the faculty who taught the subject previously, asked for their syllabus.In these approaches, they said these are conventional approaches which are time-consuming and challenging for faculty who are not tech-savvy. Besides, the faculty has to worry about content and format simultaneously.

In the absence of the system, faculty members are using a desktop application like MS Word and store the result in a specific folder of certain memory storage. The usual creation and storing process of the syllabus results to the redundancy of files, lacking required content, lacking the required composition of content, and used a wrong required format because the syllabus file is coming from many sources with different formats. Generally, it is a time-consuming task of a faculty. In some cases, the faculty would ask for a copy of the syllabus to the faculty previously handled the subject. One of the general strategies in the study of Davis [4], emphasized that if the course is new to the faculty but has been offered before, talked with the faculty who taught the subject previously, asked for their syllabus. This was practiced in SSCT; however, mostly the faculty could not provide because the file was lost or was corrupted, sometimes a draft file is given. In effect, the issue of reusability was sacrificed. With this, faculty has to make his copy instead of revising the original or existing syllabus. The process turned to late submission of the syllabus. Further said Abdous and He [3], faculty can adapt or create a new syllabus based on an existing syllabus structure and content. This option is intended to foster reusability and consistency between courses and reduced faculty workload.

HEIs are always conforming to CHED mandate on syllabus composition. Like the CHED Memorandum Order (CMO) for example in Information Technology Education (ITE) programs is observed and other programs offered in the institution. This CMO provides program goals, learning outcomes, and even outline of the selected subject CMO [5]. The provisions are observed in the system by embedding all program goals, outcomes, and the learning outcomes so as the faculty could choose the appropriate item for their subject. This embedment of the program goals, outcomes, and the learning outcomes are observed also in all programs offered.

With the specified concerns, a necessity in the Design and Development of a Syllabus Template System - A Syllabus Management Tool to allow the faculty to provide a well-designed and student-centered possible. It as well provides the template directly during syllabus creation. This may result in easy creation and early submission of the syllabus. According to Dalziel, Mason, and Dalziel [6], a template should provide a sequence of predefined activities that guide the teacher through a lesson plan such as a "role play" or "discussion activity" but will also allow the teacher the autonomy to adapt the template which he or she wishes to use.

In the system's study, the template provides directly with the predefined items, of the institutional Vision, Mission, Goals, and Institutional Learning Outcomes. It provides as well the predefined CHED recommended Program Goals, Educational Objectives, and Program Outcomes on its template. Generally, the system template is even ready for ISO form requirement in the syllabus. With this, the faculty would only have to enter the course content and a few others. This would justify the need to reuse the syllabus or some aspects in the syllabus. This is confirmed in the study of Dobozy, and Dalziel [7] when they talked about the template is underpinned by a re-use philosophy and the notion that such material can be adopted or adapted for various purposes by learning designers and developers. In the system's study reusability of some of the syllabi element requirements are observed. It is intentionally designed

to finish the syllabus in lesser time requirement. Besides, this direct template is designed in conformity to the ISO requirement in the uniformity of forms. It is also a syllabus management tool because all saved syllabus will be stored to its specific repository/location and can be managed for its creation, access, edit, search, print anytime and even retrieval for re-use in the future. With this, HEIs, particularly SSCT faculty ensures early or on-time submission of the required syllabus, thereby, creating a Sustainable Working Environment with Resilient Faculty towards subject syllabus requirements.

OBJECTIVES

The study generally aimed to Design and Develop a Syllabus Template System-a Syllabus Management Tool.Specifically, the system is designed to provide usable and efficient different modules like the File, Maintenance and Faculty which considered embedment of the predefined items in a direct template of a particular program/course. This direct template is designed in conformity to the ISO requirement in the uniformity of forms.

MATERIALS AND METHODS

This section presents the analysis, design, evaluation, and implementation of the system. Each part observed sequentially to conform to the institutional requirements. Case diagrams consist of actors, use cases and their relationships. The diagram is used to model the system/subsystem of an application. A single use case diagram captures a particular functionality of a system.

Analysis

This stage is where the developers do the analysis. The use case diagram (Figure 1), used to identify, clarify and organize system requirements. It is used to model the system/subsystem of an application. A single-use case diagram captures a particular functionality of a system. In the study of Waykar [8], used case diagrams are used to gather the requirements of a system including internal and external influences.

Figure 1 shows the use case diagram of the system. The faculty and admin can manage the system by closing the File module to exit the system. Likewise, the faculty can make subject syllabus according to the well-structured institutional format, particularly on content composition. The faculty allows changing, editing, saving, subject content of the syllabus. Likewise allows searching on preferred subjects. The admin can close the system, make the management by filling out data in the Maintenance module on the company profile, employees, academic year, programs, courses/subjects, and curricula. Some of the pre-defined entries will be used automatically in the creation of syllabus like entering into the system the head of the departments/colleges which is one of the signatories required of a syllabus.

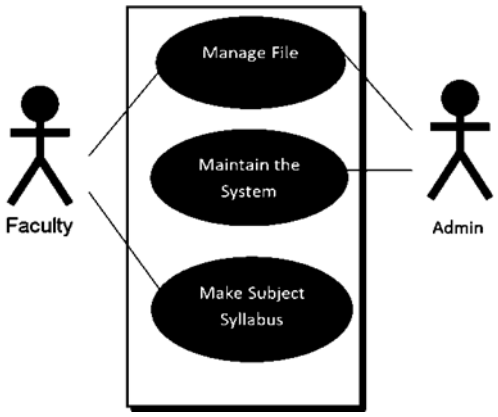

Figure 1. Use Case Diagram of the System

Design

In the design phase, the system was developed with the use of the Power Builder language - trial version as the front end and the open-source MySQL server express database as the back end. According to Rani and Jos [9], MySQL is easy, fast and efficient and can store a large number of records and requires a little configuration.

During the design, the system's study observed the developmental design in the design and development of a Syllabus Template System-a Syllabus Management Tool.

The system's study determined the faculty acceptability level through the researcher-made questionnaire accompanied by an unstructured interview to validate the responses of the selected faculty of the Institution.

During its development, the researcher applied the concept of System Development Life Cycle (SDLC), particularly Agile model. As stated [10] Agile model is characterized by short iterative cycles and extensive testing, active involvement of users for establishing, prioritizing, and verifying requirements.

Implementation

The system was installed for use to the selected faculty in their laptops. These faculty installed with

the system were demonstrated before they had used the system. The selected faculty served as the evaluators of the system to determine their acceptability level on usability and efficiency of the system. Their feedbacks were considered and incorporated right away because the system is adaptive to changes and quickly respond to user requirements.

Evaluation

A structured questionnaire was used in the study. It is structured because the set of questions are defined based on ISO 9126, particularly on usability and efficiency systems characteristics. ISO 9126 covers a wide spectrum of system features, including both technical requirements and human interaction with the system [11]. There were 50 selected faculty members who answered the questionnaire. This questionnaire was validated by an expert in the field of the system's development and technological researches. As mentioned in [11], the system characteristics are reliability, efficiency, functionality, usability, maintainability, and portability. In the system's study, usability and efficiency were considered for the evaluation because these characteristics were appropriate for the need of the faculty for a usable and efficient system. Stressed out in the study of Losavio et. al [12], the usability is the capability of the software product to be easily understood, learned, and used under specified conditions. According to Sangeetha et al. [13], usability means the ease of use for a given function.

In the system's study, the system's usability as follows: provides an easy way of storing and retrieving the syllabus; provides clickable functions which are easy to operate; functions are easily learned; faculty learned the system with minimal effort; provides the user friendly interface; and the system generally provides a good looking/friendly environment. In like manner, the efficiency of the system is the capability of the software product to provide appropriate performance, relative to the number of resources used, under stated conditions. Mentioned by Omorog [14], efficiency speaks of productivity. In the system study, efficiency talks on lesser time consumption when retrieving of existing syllabus to its repository; speedily respond during navigation of functions; efficient in editing and searching of syllabus; function's provision which can be carried out easily and quickly; quick in printing the syllabus; and print outs provision consistent to institutional format.

The study used descriptive statistics to determine the weighted mean as the basis for the evaluation of the usability and efficiency system's characteristics. Questions were put a five-point Likert scale with responses ranging as Highly Effective (HE): 4.50 – 5.00; Effective (E): 3.50-4.49; Moderately Effective (ME): 2.50-3.49; Ineffective (I): 1.50 – 2.49; Very Ineffective (VI): 1.00 – 1.49.

RESULTS AND DISCUSSIONS

This section present results as shown in Figures 2-14 and Tables 1-2 with discussion in conformity to the claimed specific objectives. It presents different figures of the three claimed modules: the File; Maintenance; and Faculty.

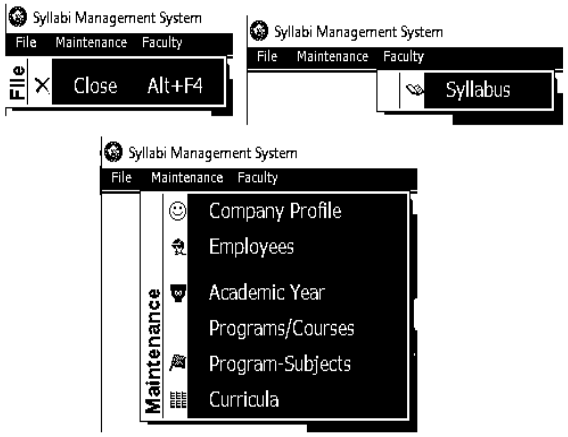

Figure 2. The File, Maintenance and Faculty Modules

Figure 2 presents the three different modules as specified in the analysis phase: the File, Maintenance and the Faculty modules. In this Figure, the faculty can manage by clicking the close label/icon to exit the system. Likewise, the faculty can make subject syllabus to the defined well-structured template for entering particularly the course content. The faculty allows changing, editing, saving, subject content of the syllabus. Likewise allows searching on preferred subjects. The Admin can manage through entering the required data on its company profile, employees, academic year, programs, courses/subjects, and curricula. It will be filled out with information for use in the syllabus creation as shown in Figures 3-9.

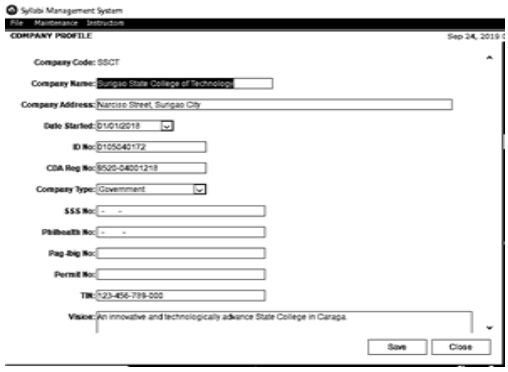

Figure 3. The Company Profile Entry Form

Figure 3 presents the company profile, the company name being entered would reflect right away as heading of the final syllabus.

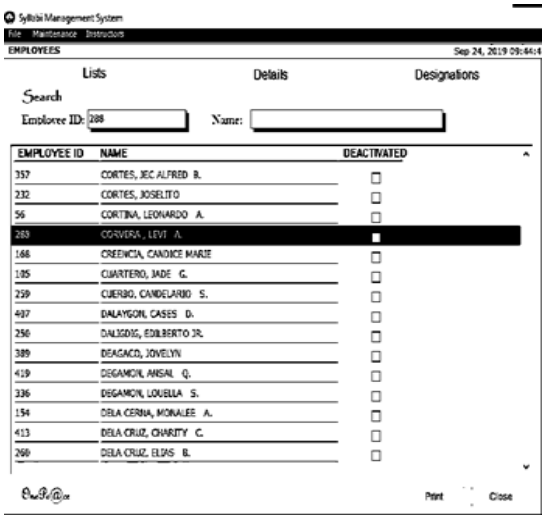

Figure 4. The Employees Entry Form

Figure 4 presents a list of Employees. It will be selected by the Faculty during syllabus creation. The employee's complete name selected will be carried to the syllabus template under the "Prepared by" section for a signature.

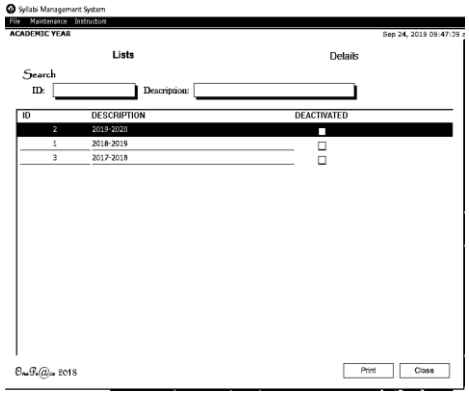

Figure 5. The Academic Year Form after the Entry

Figure 5 shows the academic year in its proper repository. This will be selected as to what academic year during retrieval or syllabus creation.

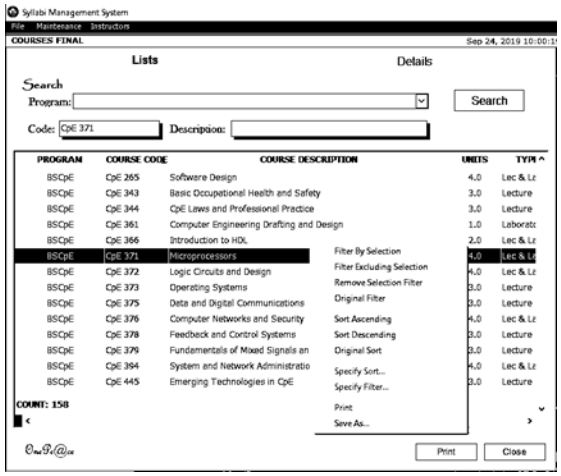

Figure 6. The Programs/Courses Form after the Entry

Figure 6 presents the different programs offered in the institution. This will be selected because each program is embedded with a generic content of the syllabus like the CHED recommended Program Goals, Educational Objectives, and Program Outcomes with the embedment of the institutional Vision, Mission, Goals, and Institutional Learning Outcomes. As soon as the program is selected, this embedment will be passing over to the final syllabus.

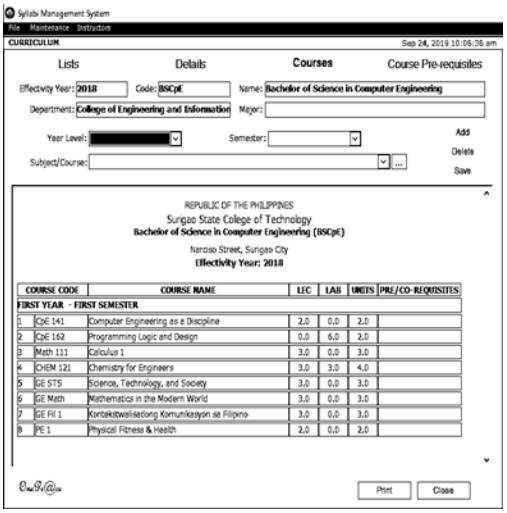

Figure 7. The Subjects of the Specific Program/ Course Form after the Entry

Figure 7 presents the subject of a specific program. This will be selected during curriculum and syllabus creation, updating and printing.

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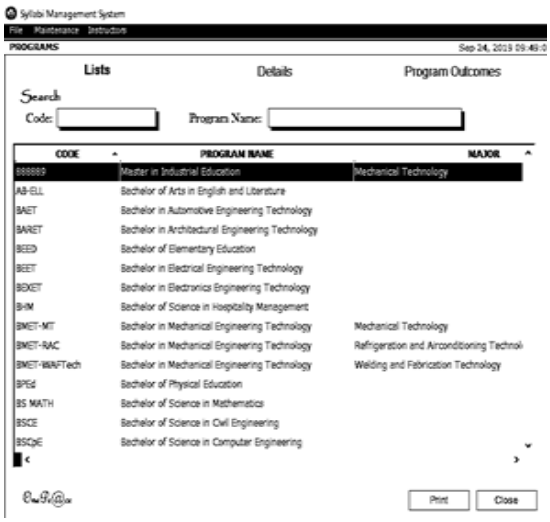

Figure 8. The Program Curriculum

Figure 8 presents the list of subjects per curriculum with corresponding codes. The numbers of units, hours, pre/co-requisites, lecture class or laboratory are also considered in the final syllabus.

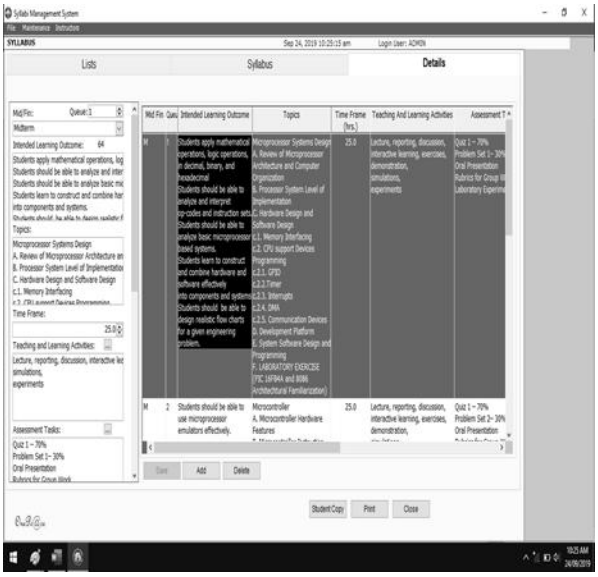

Figure 9. The Embedded Educational Objectives, Program Goals and Program Outcomes

Figure 9 shows the embedded Educational/ Institutional Objectives and Program Goals. The Faculty has to choose which of the given items is suited to the subject created. They are also allowed to add an item if the item is not in the list.

Figure 10 shows the existing syllabus upon searching either the code or description of the subject. It can be added, edited if necessary by assigning its specific queue. In this section, the Faculty can make syllabus by pointing to specific queue and then type the required columns, some are to be selected if there are listed items already like time frame, teaching and learning, assessment tasks and others.

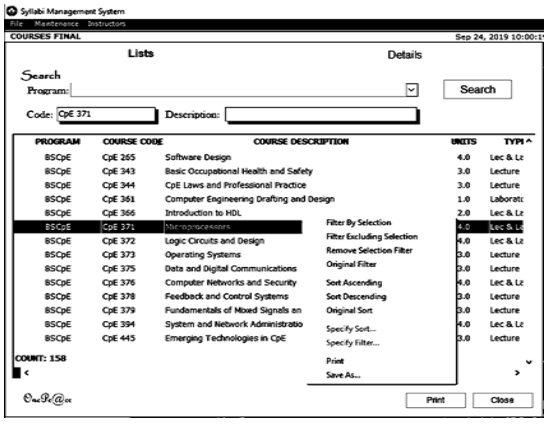

Figure 10.List of Topics per Subject.

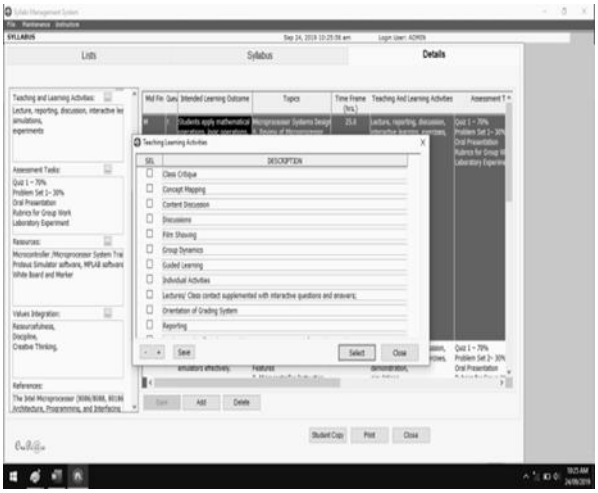

Figure 11. Embedded Teaching and Learning Strategies

Figure 11 shows the embedded Teaching and Learning Strategies. The Faculty has to choose which of the given items is suited to the subject created. They are also allowed to add an item if the item is not in the list.

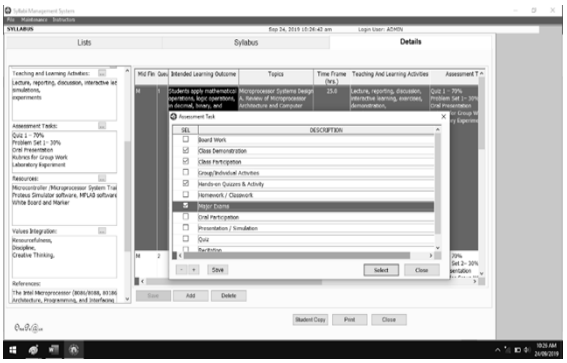

Figure 12. Embedded Assessment Task

Figure 12 shows the Embedded Assessment Task. The Faculty has to choose which of the given items are suited to the subject created. They are also allowed to add an item if the item is not in the list.

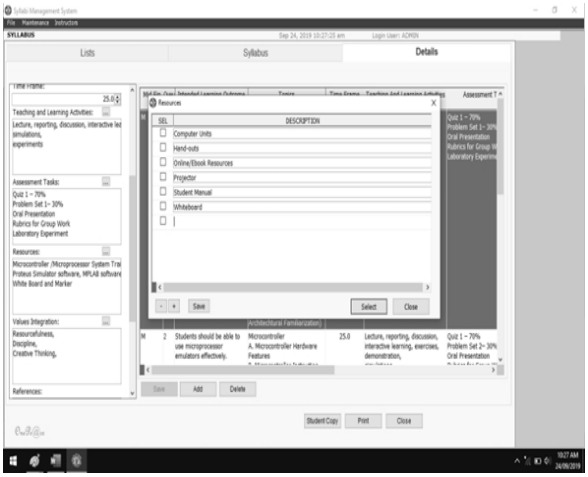

Figure 13. Embedded Resources

Figure 13 shows Embedded Resources. Faculty can choose an item of resources applicable to the subject. The faculty can add other resources if there is no available in the item lists.

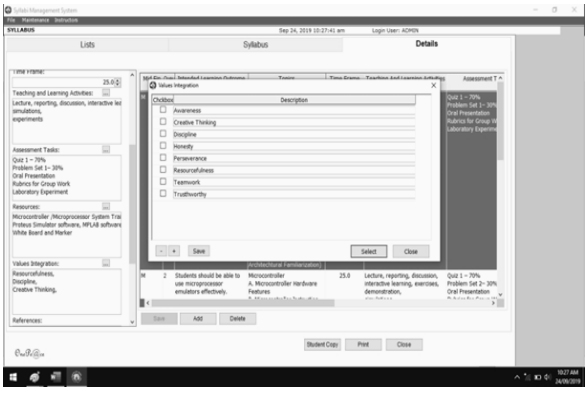

Figure 14. Embedded Values Integration

Figure 14 shows the Embedded Values Integration. Faculty can choose an item of values integration used during the delivery of instructions. The faculty can add other values if there is no available in the item lists.

Finally, thefinal output can be retrieved at its repository and can be modified by adding, deleting, and even renaming if deemed necessary with aspecified date of revision. However, the original one would be retained to its repository. This can be printed right away at the specified paper size. The final output is consistent with the institutional format and this could be changed whenever necessary.

Table 1. Level of Usability System's Characteristic

System's Evaluation on the Level of Usability: The Faculty perceives/accepts that the system provides:	**Mean**
1. an easy way of storing and retrieving to its repository;	**4.44**
2. clickable functions which are easy to operate particularly in the syllabus making;	**4.16**
3. functions which are easily learned particularly the embedded items;	**4.36**
4. features which require a user with minimal effort;	**4.68**
5. the user-friendly interface; and	**4.58**
6. a good looking/friendly environment.	**4.50**
Weighted Mean	**4.45**

Table 1 as shown, depicts the system evaluation "mean" and "mean weighted" ratings on the level of usability. Golden [15], said that usability needs to be addressed early in the design process in ways that enable it to be successfully incorporated into software architecture designs and software engineering implementations. As vouched by Sangeetha et al. [13], in the study of Buctuan [16], usability means the ease of use for a given function. As shown in the Table the weighted mean of 4.45 which is qualitatively interpreted as "Effective". It means that the system is effective in its efficiency characteristics. This connotes that the system provides an easy way of storing and retrieving to its repository; clickable functions which are easy to operate particularly in the syllabus making; functions which are easily learned particularly the embedded items; features which require a user with minimal effort; the user-friendly interface; and a good looking/friendly environment.

In detail, the item which emphasized that provides features which require a user with minimal effort garnered the highest mean of 4.68 qualitatively interpreted as "Highly Effective" system characteristic. This is true because this is the most consideration of the developers in the early stage of development to eliminate faculty pressure in the creation of syllabus. On the other hand, the item which emphasized that the system provides clickable functions which are easy to operate particularly in the syllabus making garnered the lowest mean rating of 4.16, but still qualitatively interpreted as "Effective". This is not too alarming to note considering it is still on its effective rating. However, this least result is attributed to unfamiliarity in using the syllabus template due to lack of proper training and proper venue. Jianyang Mei, [17] considered challenges

which include having poor time management skills and unfamiliarity with using syllabi. Toland et al. [18], considered problematic issues related to ease of use were exacerbated by a lack of adequate training. Thus, in the system's study, the least rating can be resolved by allowing faculty to be familiar with the system through proper training in a proper venue.

Table 2. System's Evaluation on the Level of Efficiency

The Faculty perceives/accepts that system:	**Mean**
1. consumes lesser time when retrieving of the existing syllabus to its repository to adopt or reuse;	4.76
2. responds speedily during navigation;	4.90
3. is efficient in editing and searching of the syllabus;	4.92
4. has a function which can be carried out easily and quickly;	4.84
5. is quick in printing the syllabus; and	4.88
6. provides print outs consistent to institutional format.	5.00
Weighted Mean	4.88

Table 2 as shown, depicts the system evaluation mean and weighted mean ratings on the level of efficiency. According to Nhan (2014) in the study of Caraig [19], efficiency is the system's ability to provide suitable functions to optimize resources and improve performance in specific conditions. As shown in the Table the efficiency weighted mean of 4.88, qualitatively interpreted as "Highly Effective" characteristic. It means the system is a highly effective efficient system's characteristics. It implies that the system generally consumes lesser time when retrieving of the existing syllabus to its repository; responds speedily during navigation; efficient in editing and searching of the syllabus; has a function which can be carried out easily and quickly; is quick in printing the syllabus; and provides print outs consistent to institutional format.

In detail, the item which stressed out that system provides print outs consistent to institutional format garnered the highest mean of 5.00, qualitatively interpreted as "Highly Effective" system characteristic. This is true considering Figures 15-20, which show the institutional format as required and approved for use with SSCT. This is intentionally designed to submit right away without worry of inconsistency to the format. However, an item which emphasized that the system consumes lesser time when retrieving of the existing syllabus to its repository to adopt or reuse got the lowest mean of 4.76 but still in "Highly Effective" efficiency systems' characteristics. Thus, it shows not alarming to note but still can be modified for efficiency purposes. In the system's study, it allows reusability for consistency of the syllabus structure. This reusability function/feature is similar to the study of Abdous and He [3], when they said that faculty can adapt or create a new syllabus based on an existing syllabus structure and content. This option is intended to foster reusability and consistency between courses and reduced faculty workload.

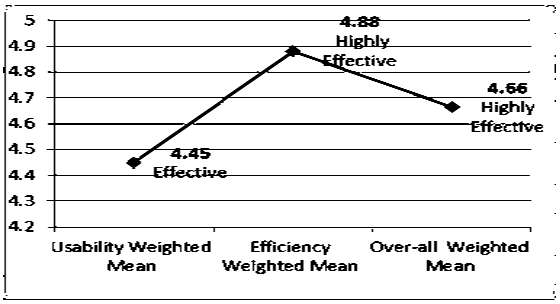

Figure 15. Summary Result of the Faculty Acceptability Level

As reflected in Figure 15, efficiency gained the highest weighted mean of 4.88, described as "Highly Effective" followed by the usability got the weighted mean of 4.45,still "Effective" as construed. The overall system faculty acceptability level on usability and efficiency garnered a rating of 4.66 which indicates that the system is "HighlyEffective". It means that the Design and Development of a Syllabus Template System - a Syllabus Management Tool functioned as designed that is effective usability in the institution and it's highly effective efficiency is observed with the faculty.

CONCLUSION AND RECOMMENDATION

The system was perceived effective usability system's characteristics and highly effective efficiency system's characteristics as designed. It is concluded that the system met the defined objectives to design and develop a usable and efficient the Syllabus Template System - a Syllabus Management Tool to eliminate the difficulty of the faculty of the syllabus requirement. It implied that the system is a Syllabus Management Tool because the system can be retrieved anytime and reuse whenever necessary. Generally, the system was perceived highly usable as designed and highly efficient for use in the institution. It functioned

as expected with its defined modules having predefined items as recommended by CHED and the syllabus template conformed to ISO form. The realization of the study is an indicator of Creating a Sustainable Working Environment with Resilient Faculty towards subject syllabus requirements. Since the present system's development is an independent stand-alone system by individual faculty's computer, conduct further studies and make it a Cloud-based system. Extends its capabilities to other HEIs for them to take the advantage of this management tool for well-structured syllabus requirements and the present system's widely used.

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