International Journal of Environmental Sciences
ISSN: 2229-7359
Vol. 11 No. 16s,2025
https://theaspd.com/index.php

SeDi LMSS: A Self-Directed Learning Management and Support System for Flexible Teaching and Learning Experience

Rosalinda B. Guiyab[1], Ivy M. Tarun[2], Amy Lyn M. Maddalora[3], Dominic C. Cabauatan[4], Vince Lloyd Q. Balisi[5], Roselle M. Beltran[6]
[1,2,3,4,5]College of Computing Studies, Information and Communication Technology
[6]College of Teacher Education

Abstract: *This study explored the customization of a platform for the Learning Management and Support System (LMSS) dubbed as SeDi: Self Directed LMSS and examined how usable the platform is using the quantifiable usability metrics such as completion rate, overall relative efficiency, and task level satisfaction. The development of the platform followed the four-phased rapid application development methodology to meet the requirements of the target beneficiaries more quickly. Participants in the evaluation of usability were users who are computer literate and first-time users of the platform. Results show that the customized platform is effective in terms of completion rate, efficient in terms of overall relative efficiency, and very easy to use in terms of task-level satisfaction.*
Keywords: *Self Directed, Learning Management, and Support System, Web-based system*

INTRODUCTION

There has been a worldwide demand for flexible learning in educational institutions due to the Corona Virus 2019 (CoViD-19) pandemic. In fact, the Commission on Higher Education is encouraging all Higher Education Institutions (HEIs) to use flexible learning modes as there will be no regular face-to-face classes this 1st Semester, AY 2020-2021. Hence, there is a significant need to shift from the traditional teaching and learning modes to a more flexible one, reminding us of our greater role as a facilitator rather than a transmitter of knowledge. This calls for actions among the different HEIs to find ways to cope with the challenge of time.

In response to this call, the Isabela State University Cabagan (ISUC) called for the Workshop on Campus Design Express to come up with solutions to address the need of flexible learning as there will be no face-to-face classes thus, helping ISUC students become effective self-directed learners.

From the foregoing, three faculty members (Dr. Ivy Tarun, Dr. Rosalinda Guiyab and Prof. Dominic Cabauatan) of CCSICT have participated in the Campus Design Express. One of the solutions that were formulated by the Campus Design Express Team was the implementation of Learning Management System (LMS). With this, the TraCCER in coordination with CCSICT through the supervision of Dr. Amy Lyn Maddalora together with the office of MIST have installed and configured the Moodle-based LMS last May 11-29, 2020 which was named by the Team as SeDi (Self-Directed) Learning Management and Support System. SeDi is
now available online with the URL: https://app.isucabagan.edu.ph/sedi and was already pilot-tested by the CCSICT faculty in their MidYear classes.

Relative to the above, the research and extension project entitled "*SeDi: A Self-Directed Learning Management and Support System*" was conceptualized. This project has two components, first is its research component which involves the development of a platform, and second is its extension component where the developed platform is transferred to the target beneficiary. It may be worthy to mention that**,** in the spirit of Bayanihan, the ISUC shared this initiative with other HEIs, particularly to the Batanes State College and the Apayao State College.

This study focused on the first component where a platform was developed. Generally, this study was conducted to help address the concern about the use of flexible learning.

Specifically, it aimed to:

Develop a platform for a Self-Directed Learning Management and Support System that provides for the following features:

For the Faculty:

Account management,
Course management,
Profile management,
Participants management,
Activities and Resources management, and
Exporting and downloading of reports.

For the Students:
View course,
Mark Attendance,
Download resources,
Submit activities,
Take exam, and
Participate in the virtual classroom and discussion forum
Determine the level of usability of the developed platform using quantifiable usability metrics.
Software Methodology
The Rapid Application Development (RAD) methodology as shown in Figure 1 was adopted as the project was implemented in a short span of time emphasizing the rapid prototyping and output delivery. The following RAD phases were carried out:

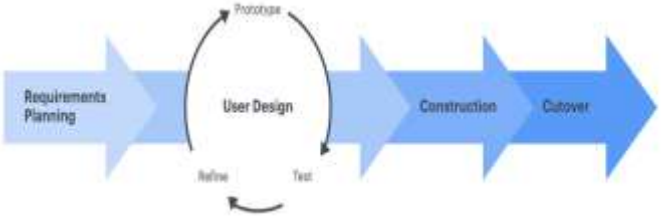

Figure 1. Rapid Application Development Methodology (Lucidchart Content Team)
Requirements Planning. This is the phase where the project scope and LMSS requirements were defined. This was done through coordination with the Design Express Team and the students. Conduct of online interviews and consultative meetings with the target clientele were undertaken.
User Design. This is the phase where initial models or prototypes were created with the help of the Design Express Team and students to ensure that their needs are met.
Rapid Construction. This is the phase where actual development, testing, and integration took place. Along with User Design, the Rapid Construction phase was repeated as often as necessary, as new components were required or alterations were made to meet the needs of the client. Along this process of customization, aside from the Design Express Team, the IT experts also gave inputs to the platform.
Cutover. This is the phase where a full-scale testing with the help of the IT experts, faculty members and students was conducted. Actual data were entered into the system to verify the accuracy of the generated reports. After the successful full-scale testing, users were selected to perform tasks in order to determine the platform's usability using the three metrics - effectiveness, efficiency, and task-level satisfaction from the ISO/IEC 9126-4 Metrics.
System Usability
To determine the extent of the platform's usability, 11 faculty members and 50 students who were enrolled in their Midyear classes participated during the evaluation of the system's usability. Each of the users was required to perform common transactions and data were collected from these tasks. The common transactions performed by the faculty members were enrolling of students, account management, course management, profile management, participants' management, activities and resources management, exporting and downloading of reports. On the other hand, students can view course, mark attendance, download resources, submit activities, take exam, and participate in virtual classroom and discussion forum.
To determine the effectiveness of the platform, completion rate was used to track the completion of tasks. It makes use of a binary measure of pass and fail that is coded as 1 or 0 and computed using the formula (Sauro, 2011):
Co*mpletion Rate*$=Number\ of\ task\ completed\ successfully\ /\ Total\ number\ of\ tasks\ undertaken\ x$ 100%
For the efficiency of the platform, task time and overall relative efficiency were considered to track the time that the task was completed using the formula:
$\boldsymbol{overall\ relative\ efficiency} = \Sigma\Sigma nijtijNi{=}1Rj{=}1/\quad \Sigma\Sigma tijNi{=}1Rj{=}1\ x$ 100%
Where:
N = The total number of tasks (goals)
R = The number of users
nij = The result of task I by user j; if the user successfully completes the task, then
Nij= 1, if not, then Nij = 0

tij = The time spent by user j to complete task i. If the task is not successfully completed, then time is measured till the moment the user quits the task

According to Sauro (2011) as stated by Mifsud (n.d.), there is actually no exact arbitrary rating for completion rate as well as efficiency as it is highly dependent on the context of the task being evaluated. However, for this study, the interval and description for the completion rate is shown in Table 1.

Table 1. Interval and Description for Completion Rate and Relative Efficiency Range

Interval and Description for Completion Rate and Relative Efficiency Range	**Description (Completion Rate)**	**Description (Relative Efficiency)**
100-91	Excellent	High
90-81	Good	Average
80-71	Fair	Good
71 and below	Unacceptable	Poor

For the task level satisfaction, Single Ease Question (SEQ) was used where each user was asked to rate the difficulty of performing the task using a 4-point Likert scale from Very Difficult (4) to Very Easy (1). The interval and equivalent description used is shown in Table 2.

Table 2. Interval and Description for Task Level Difficulty Range

Interval and Description for Task Level Difficulty Range	**Description (Completion Rate)**
4.0 – 3.25	Very Difficult
3.25 – 2.5	Difficult
2.4 – 1.75	Easy
1.74 – 1.0	Very Easy

2. RESULTS AND DISCUSSION

The SeDi: A Self-Directed Learning Management and Support System

SeDi was developed to address the worldwide demand for flexible learning to educational institutions due to the Corona Virus 2019 (CoViD-19) pandemic as well as to the call of the Commission on Higher Education to all Higher Education Institutions (HEIs) to use flexible learning mode as there will be no regular face-to-face classes. It is a platform designed to help students become effective self-directed learners. It allows the flexible delivery of educational courses and creation of personalized learning environment that will enable students to be more proactive in planning, organizing, and monitoring their course activities.

Specifically, the features were carefully designed according to the needs of the faculty members and students to become self-directed learners.

The Figures in the succeeding pages present the features of SeDi for both the faculty and students.

SeDi LMSS Features

SeDi's core features include an easy-to-use interface, personalized dashboard, collaboration tools, uploading and downloading of resources, assessment with rubrics, all-in-one calendar, automatic notifications, virtual classroom, and detailed reporting and logs. It is a web-based application and can therefore be easily accessed anytime and anywhere using any devices and web browsers.

For the Faculty

a. Account management

Figure 2 shows the account management. This feature lets the user enter his/her account information such as the username and password to login to SeDi. The password must be at least eight (8) characters long and contain uppercase and lowercase letters, digits, and special characters.

International Journal of Environmental Sciences
ISSN: 2229-7359
Vol. 11 No. 16s,2025
https://theaspd.com/index.php

Figure 2. Account Management

b. Course management

Figure 3 shows the course management. The faculty can edit the course settings and monitor the participants (students) of the course. This is where all activities and resources are added and managed.

Figure 3. Course Management Profile

c. Profile management

Figure 4 shows the profile management. The faculty can edit their own general information such as name, email address and profile picture.

Figure 4. Profile Management

d. Participant's management

Figure 5 shows the participant's management. Participants are those who are enrolled in the course. The faculty can manually enroll their students as participants in the course based on their class list.

Figure 5. Participants Management

e. Activities and Resources Management

Figure 6 shows the activities and resources management. Activities and resources are items that the teachers add to the course to support teaching and learning. There are several activities that can be added to the course such as

Assignment, Attendance, BigBlueButton, Forum, Quiz, etc. While files or links are resources that can be added to the course.

Figure 6. Activities and Resources Management

f. Exporting and Downloading of Reports

Figure 7 shows the exporting and downloading of reports. SeDi can generate reports like grades, attendance, and the like. These reports can be exported and downloaded in different file formats such as spreadsheets and documents.

Figure 7. Exporting and Downloading of Reports

For the Students

a. View course

Figure 8 shows the view course. The courses that the student is enrolled in can be viewed in the dashboard. It displays all the titles and descriptions of the course which the student can click to view the content of the course.

Figure 8. View Course

b. Mark Attendance

Figure 9 shows the mark attendance. Students can mark their own attendance based on the scheduled date and time of the course.

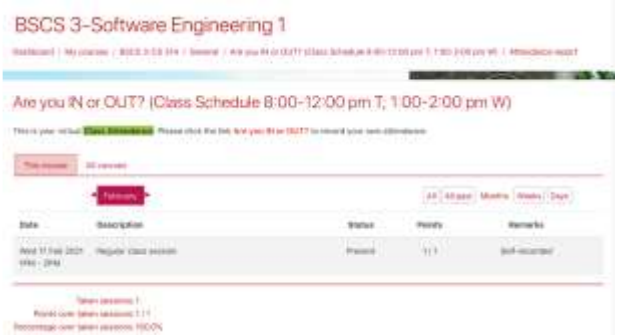

Figure 9. Mark Attendance

c. Download Resources

Figure 10 shows the download resources. Learning resources like modules can be downloaded by the students and saved on their own mobile phone, laptops, or gadgets.

Figure 10. Download Resources

d. Submit Activities

Figure 11 shows the submitted activities. Students are capable of uploading their assigned activities in different file formats up to 2MB.

Figure 11. Submit Activities

e. Take exam

Figure 12 shows the take exam. Online quizzes can be administered through SeDi. Different types of quiz include multiple choice, matching type, essay, etc. Students can take the exam online with time duration.

Figure 12. Submit Activities

f. Participate in virtual class and discussion forum

Figure 13 shows the participate in the virtual class and discussion forum. Students participate in virtual classes and discussion forums. Virtual classes can be recorded and played back.

Figure 13. Participate in virtual class and discussion forum

ii. Usability of SeDi

For the usability of SeDi, six female and five male faculty users while 30 female and 20 male student users participated in the evaluation. These users are all first-time users of the platform but are computer-literate. For the efficiency of the platform, Figures 14 and 15 show the average completion rate per task of faculty and students, respectively. All the users both faculty and students were able to successfully complete their task. Generally, 97.68% of the faculty users managed to complete the task as shown in Figure 14 while 95.11% of the student users managed to complete the task as shown in Figure 15 which means that an excellent completion rate was obtained for both faculty and student users.

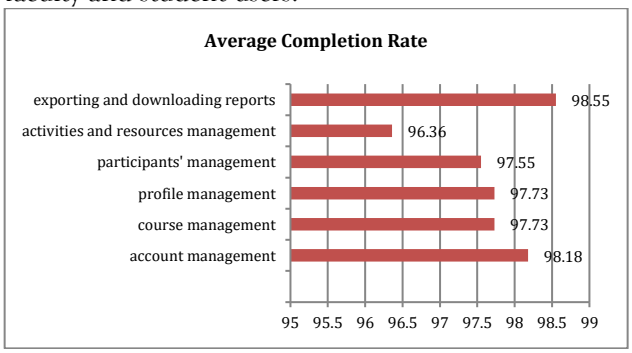

Figure 14. Average Completion Rate per Task of Faculty

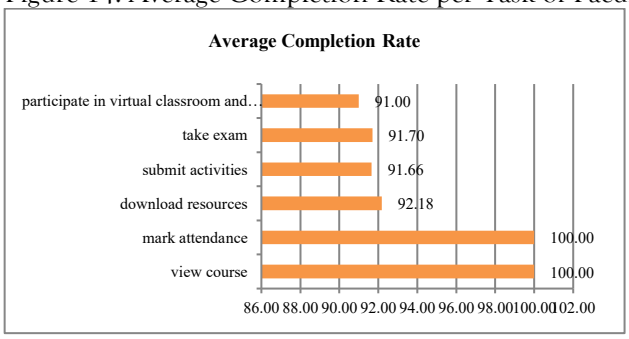

Figure 15. Average Completion Rate per Task of Students

Figures 16 and 17 show the average task time per task of faculty and students, respectively.

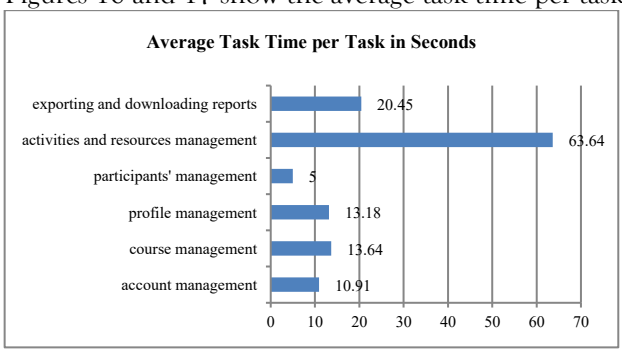

Figure 16. Average Task Time per Task of Faculty

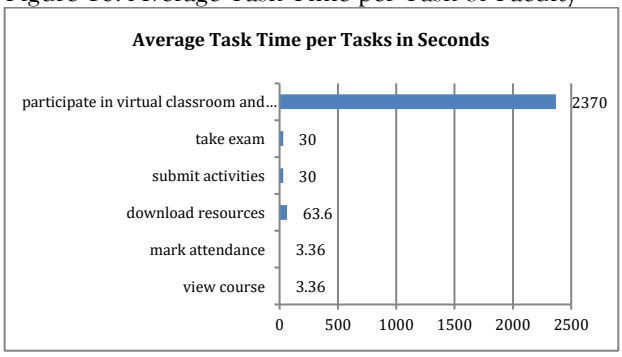

Figure 17. Average Task Time per Task of Students

From the task time collected, the computed overall relative efficiency per task is shown in Figures 18 and 19. Generally, the overall relative efficiency yields 91% for both the faculty and students. This means that the platform has relatively high efficiency when it comes to time taken by the users who successfully completed the task.

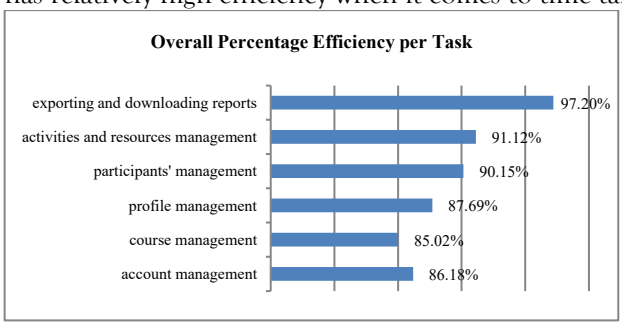

Figure 18. Overall Relative Efficiency per Task of Faculty

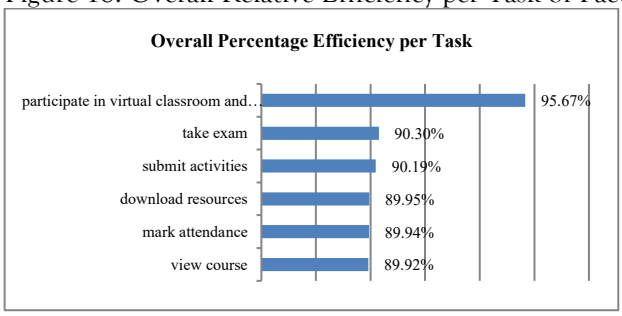

Figure 19. Overall Relative Efficiency per Task of Students

For the task level satisfaction, Figures 20 and 21 shows the frequency of users per level of difficulty. One hundred percent of faculty users perceived that the SeDi is very easy to use while none of them said it was very difficult. On the other hand, student users, that is 66.67%, perceived that SeDi is very easy to use while none of them said that it was difficult. The mean difficulty is 1.45 which implies that SeDi is very easy to use. This could be attributed to the simple design interface of SeDi where options can be easily accessed. Sergeev (2010) said "that good design can boost User satisfaction and partially even Efficiency".

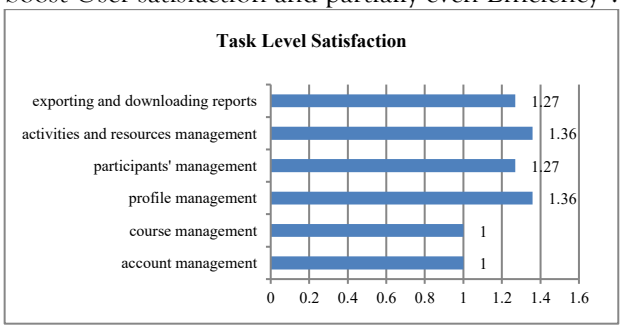

Figure 20. Task Level Satisfaction of Faculty

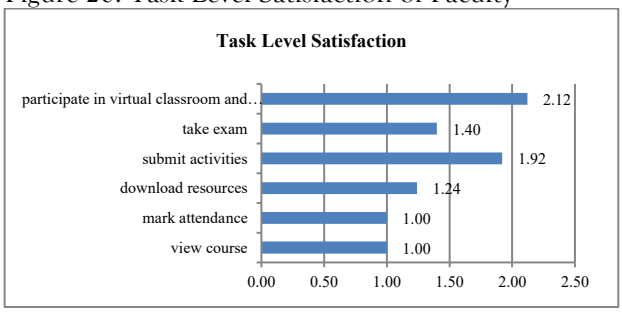

Figure 20. Task Level Satisfaction of Students

CONCLUSION

Based on platform development and evaluation, the following conclusions were drawn:

The SeDi: Self Directed Learning Management and Support System has fully met its desired functions for both the faculty and the students of providing a platform for account management, course management, profile management, participants' management, activities and resources management and exporting and downloading of reports; and view course, mark attendance, download resources, submit activities, take exam and participate in virtual classroom and discussion forum respectively.

The SeDi: Self Directed Learning Management and Support System is effective and efficient as far as completion of tasks by the users is concerned. It is further concluded that the platform is very easy to use based on the tasks performed by the users.

REFERENCES

1. Lucidchart Content Team (n.d.). 4 Phases of Rapid Application Development Methodology. Lucidchart. https://www.lucidchart.com/blog/rapid-application-development-methodology
2. Mifsud, Justin (n.d.). Usability Metrics – A Guide To Quantify The Usability Of Any System. Usability Geek. https://usabilitygeek.com/usability-metrics-a-guide-to-quantify-system-usability/
3. Sauro, Jeff (2011). What is a Good Task-Completion Rate?. Measuring U. https://measuringu.com/task-completion/
4. Sauro, Jeff (2011). 10 Things to Know about Completion Rates. Measuring U. https://measuringu.com/completion-rates/
5. Sergeev, Anton (2010). Visual Design of Interfaces. UI Designer. http://ui-designer.net/graphics_design.htm