INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY: APPLIED BUSINESS AND EDUCATION RESEARCH
2023, Vol. 4, No. 6, 1767 – 1777
http://dx.doi.org/10.11594/ijmaber.04.06.02

Research Article

Development of Instruction – Augmenting Project for Faculty Members of the Department of Management Studies: An Action Research

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Article history:
Submission June 2023
Revised June 2023
Accepted June 2023

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ABSTRACT

This study aimed to assess the developed e-class record system to help the academic staff of the Cavite State University – CCAT Campus. The researchers wanted to evaluate the said system to determine the effectiveness and ease of use of the e-class record system. This study employed quasi-experimental and phenomenological designs to understand user experience to augment the Technology Acceptance Model (TAM). The intervention employed by the researchers was efficient and saved 0:25:51 of time in minutes, as indicated by the average cumulative usage time of 58:20.8 minutes. The goal of setting the intervention was to use e-class records, which had the desired result. This action research revealed the efficiency with regard to the time stamping with intervention, which helped the faculty improve their target goal of efficiency in recording grades. This study recommended having more knowledge and learning among the faculty using the said e-class record system.

Keywords: *Action Research, Department of Management Studies, Excel Sheet, Report of Rating, Technology Acceptance Model*

Introduction

The twenty-first century is commonly considered an era of technology. Today, technology is extremely important in our daily lives. It is regarded as the foundation of an economy's growth. An economy that needs more technology will be able to grow in today's situation in academe, service, businesses, and markets (Solis and Tadeo, 2022) which at the end of the day goads in achieving ease of level through increased satisfaction among clientele (Mendoza et al., 2023). This is due to the fact that technology influences our lives. Work is much easier and takes less time. The impact of technology can be felt in any field, one of which is education. In both corporate and academic settings, education is critical. Education or training is used to help workers do things differently

How to cite:
Vitobina, C. B. A., Ronas, S. M. S., Navales, B. B., & Dela Rea, K. T. (2023). Development of Instruction – Augmenting Project for Faculty Members of the Department of Management Studies: An Action Research. *International Journal of Multidisciplinary: Applied Business and Education Research*. *4*(6), 1767 – 1777. doi: 10.11594/ijmaber.04.06.02

than they did before (Raja & Nagasubramani, 2018). Teaching is a tough career. Many teachers have burnout brought on by much work and extended teaching hours. Jomuad et al. (2021) explored the relationship between teachers' workload, burnout, and job performance due to overloaded designations and other work. The academic staff of Cavite State University-CCAT Campus's Department of Management Studies (DMS) continues to prepare their Report of Ratings by hand (ROR). ROR preparation usually necessitates time and effort to accurately record and transfer the students' grades into the printable ROR.

Consequently, the researchers proposed, developed, and implemented the "Cavite State University – Cavite College of Arts and Trades Accessible Report of Rating Generator Excel Sheet, also known as project CARES" to the Department of Management Studies. In order to determine the effectiveness and ease of use of Project CARES. This research may benefit those who were currently practicing the usual process to help them do the work more efficiently. This may also contribute to the whole institution of Cavite State University-CCAT Campus to their faculty and the administration.

Objectives

Generally, this action research aimed to determine the effect of applying an Excel-based system that automatically computes the students' grades and generates a rating report for the Department of Engineering of the Cavite State University – CCAT Campus.

Specifically, the researchers aimed to:

1. Design and implement Excel-based grade computing and automatic ROR generator;
2. Evaluate the implemented system in terms of:
    a. Perceived usefulness;
    b. Perceived ease of use;
    c. User acceptance; and
    d. Time efficiency;
3. Identify challenges in the implementation of the system; and
4. Craft a possible action plan to address the challenges encountered.

Review of Related Studies

Although gratifying, teaching is a tough career. Many teachers have burnout brought on by much work and extended teaching hours. Jomuad et al. (2021) explored the relationship between teachers' workload, burnout, and job performance. The study employed a descriptive-correlational design in conducting the study. The study was conducted in the South District of Mahayag, Zamboanga de Sur. The participants of the study were elementary teachers of Mahayag South Elementary School. A total of 57 participants were selected using a convenient and purposive sampling technique. The researchers utilized two questionnaires, including the Role Overload Questionnaire and the Burnout Questionnaire, as well as an assessment tool called the Individual Performance Commitment and Review form, which rates tasks that have been completed. Mean, and standard deviation was employed to identify the teacher workload, burnout, and work performance. Moreover, the researchers utilized the Pearson correlation coefficient as a statistical tool to test the significant relationship between workload, burnout, and teachers' work performance. The study revealed that Mahayag South Elementary teachers were experiencing burnout due to work overload. Moreover, the result showed that regardless of exhaustion, teachers always give their all to complete their duties which results in excellent performance. The researchers recommended that school officials provide a balanced workload that could help develop teachers' teaching quality in public schools.

As a result of the daily interactions with learners to develop their skills and competencies, instructors' work productivity will decide how well education develops. Utami et al. (2021) conducted a study to determine the direct relationship between job fulfillment and absenteeism and the performance of high school teachers in the Bekasi area. A path analysis strategy was used based on the information given. A total of 198 teachers were selected using a simple random sampling procedure and given questionnaires as the study instrument. First, the study discovered a direct connection between employee satisfaction and

increased teacher work output. The path coefficient is 0.228, while the correlation coefficient is 0.431. It implies that productivity at work will grow when job satisfaction is met. Second, absenteeism harms productivity at work. The path coefficient is equal to -0.250, while the correlation coefficient is equal to -0.427. The study suggested further that a teacher's absence hinders organizational productivity and advancement. This gives rise to the idea that a teacher's output will rise with a decrease in absence. Finally, a negative direct impact on absenteeism is provided by job satisfaction. The path coefficient is equal to -0.207, and the correlation coefficient is equal to -0.341. The outcome supported the assertion that instructors are less likely to commit absenteeism once satisfied with their jobs.

Gul et al. (2021) investigated how university professors perceived the effect of their workload on their ability to manage their time. Data were collected from 100 faculty members from 25 departments at the universities of Malakand and Swat using descriptive surveys. The faculty members were chosen through a convenient sampling technique. According to the descriptive and correlational findings, university professors had good impressions of their workload, including the number of hours they worked, how satisfied they were at their jobs, how they were used, who they were responsible for, and what their jobs involved. These teachers understand how to handle factors that contribute to job satisfaction, how to complete tasks within the allotted time to reduce workload, how to understand the material they will be teaching in a semester, how to manage their working hours and workload regularly, and how to deal with personal issues to lessen stress. Subsequent research concluded that university professors' perceptions of time management abilities, such as scheduling, planning, managing paperwork, handling interruptions, and setting priorities, were favorable. According to the findings, teachers should ensure that technology is used effectively, divide long-term objectives into medium- and short-term objectives, and complete their tasks on time to prevent inconvenience and generate quality work. It is advised that university professors distribute work each week that complies with the standards of the Higher Education Commission so they can handle it and finish it by the deadline. It is only feasible if they receive workload and time management techniques instruction.

The study of Raja (2020) conducted a study to determine the work efficiency of teachers working in different schools in the Tirunelveli educational district. Teachers employed in the Tirunelveli educational district were the participants of the study. The sample was chosen using a stratified random sampling procedure. To analyze and interpret the data, statistical methods, including percentage analysis, the T-test, and ANOVA, were utilized., The researcher used the normative survey method to gather data. The study discovered that there is no significant difference between male and female teachers when it comes to working efficiency. However, there is a significant difference between teachers who work in public, nonprofit, and private schools, as well as between teachers who teach in rural and urban settings and those who hold different degrees.

However, Tindowen (2019) found that additional workload and burden, writing anxiety, lack of time, and inadequate knowledge were teachers' main challenges in conducting action research. The study primarily aimed to determine the conception and difficulties encountered by teachers of Junior High School. The study employed a mixed research design composing quantitative and qualitative methods. The study participants were 60 teachers from the Junior High school department of the Catholic Higher Education Institution in Northern Philippines from 2017 to 2018. The results found that teachers can enhance the teaching and learning process, gain more educational and instructional information, and have a good learning impact on students by doing action research. Moreover, the study showed that teachers have challenges when conducting action research, particularly regarding literature searches, findings presentations and publications, and data gathering. The researchers suggested extending its scope as the scope of the study is limited to the Philippines to provide an idea of teachers engaged in action research and their problems and challenges encountered across all racial, socioeconomic, linguistic, and cultural groups. This conforms with the study

conducted by Abug et al. (2021) which explained that improvement in teachers work around can enhance the instruction delivery's effectiveness and efficacy.

The study by Rusman et al. (2020) explored a performance development model of the certified instructors at private vocational schools through school principal leadership, working environment, and teachers' reduced motivation. A descriptive correlational design with a multiple regression analysis was employed in the study. A total of 118 certified teachers from different private vocational schools in Tegal, Central Java, Indonesia, were selected using a purposive random sampling technique. A survey questionnaire was utilized to gather data and analyze it using SPSS. The study revealed that principal school leadership and working environment positively and significantly influence the teachers' performance. However, affiliating motivation did not correlate with the performance of teachers. The regression analysis showed that the leadership of the school principal, the working environment, and affiliating motivation of teachers influenced the certified teacher's performance. The study suggested that principals of private vocational schools should continuously improve their leadership and formulate positive working environments.

Olivo (2021) conducted a descriptive-correlational study to identify and analyze the time management techniques used by the district's public elementary teachers. A total of 103 elementary school teachers from a district participated in the study. The complete enumeration sampling technique was utilized since all of the district's teachers were the participants in the study. The researcher created a time management questionnaire based on the tasks that instructors must do and disseminated it with the assistance of the principals. The teachers provided a 24-hour summary of their time on each assignment. The data on time management were analyzed using the weighted mean, and Pearson R was used to assess the relationship between teachers' time management and their educational performance. Findings showed that teachers were generally very satisfied with their work. Classroom instruction received the most time allocation among the teachers. Teachers' time management strategies included using the internet for their needs in teaching, making a list of their day's most important tasks, planning ahead of time, and working late at home to complete tasks. Work delegation was the least effective of their time management strategies. Furthermore, the results of this study demonstrated that the teachers' evaluations of their teaching performance were influenced by their time management techniques. It might be a trend because most teachers received very high ratings. The results showed that only 12 participants gave an excellent rating. The factor that determined or predicted teaching performance should be explored if time management was not a factor, which the relationship test indicated was accepted as the null hypothesis. The research recommended that teachers continue giving the same passion and dedication to their work to produce students imbued with the right values, knowledge, and skill competence. Teachers must also continue dedicating the majority of their time in school to classroom instruction. Finally, they must accept the challenge of the work responsibilities associated with being a teacher since they allotted more time for preparations and classroom teaching; teachers have mastered the art of time management. The researchers created an action plan to enhance and sustain teachers' time management strategies.

According to Marcel and Faustin (2019), the majority of current institutions of higher education use manual systems to manage their students' records. As a result, workers were under pressure to complete their work accurately. The service level is always based on the person using manual student management systems, which mandates that management provide ongoing training for staff to maintain employee motivation and guarantee that they follow the proper processes. The quality of services offered to students suffers when manual information systems are used since it is quite simple to unintentionally result in inaccurate student data input procedures and even hand-written student recording registers. The researchers developed a student information management system that is both efficient and easy to use. The study aims to provide a way for registrars

to retrieve information about students, courses, curriculum, instructors, and student grades to manage student-related data and track student information. Users can produce semester grade reports, student transcripts after graduation, batch and placement information, and other resource-related information. Students can register with GSMIS, update their personal information, and receive information about their academic progress, access reports, any other assignment information, and results from their final exams. The University of Gitwe's website includes a safe and attractive online interface called the Gitwe Student Management Information System. It gives employees and students access to faculty information, batch execution details, student information in all respects, and any academic notifications the university administration has updated. Many reports and inquiries can be generated depending on various variables linked to students, batches, courses, faculty, exams, semesters, and certification. It also enables and explores all the activities in the institution. The system was constructed using technologies including PHP, HTML, Jquery, JavaScript, CSS, and MySQL. The research revealed that the Gitwe Management Information System met all user expectations. The system is necessary for the personnel to have less work to do, which lowers malpractice. Also, it has a protected, digitized, and user-friendly interface. Formerly manual processes have been digitized and are now available online around the clock. The researchers concluded that the new system is a highly effective GUI-based component that now functions as intended and satisfies all user needs. The system was developed to address the issues without introducing data or information corruption. This also conforms to the innovations of personal streamers in transitioning technological improvement to improve their activities (Mendoza et al., 2023). Hence improving both in industry and academe, technology posits improvement in process and output.

In addition, Ndukwe et al. (2019) noted that it is difficult to mark written essays in big classes and that being able to give students fast and precise feedback is essential to learning. The study aimed to examine the automated grading system, which uses chatbots to pose questions and collect responses from students. For automated grading, the researchers used unsupervised machine learning techniques. The researchers then tested how well the chatbot performed compared to human grading. A total of 15 students participated in the study and were expected to provide brief written responses to the study's questions. The study used online semantic text analytics, a large question-and-answer dataset, and a term-frequency inverse-document function with cosine Euclidean distance. The study found that the automated grading and the human instructor had a high level of inter-rater agreement. The study opens up possibilities for deploying chatbots to provide automated assessment while encouraging student interaction. The need for computational thinking instruction in K–12 has grown as computing has become a fundamental aspect of our world. Alves (2019) stated that one of its basic competencies is programming, often taught by learning activities without a predefined solution using block-based visual programming languages. Moreover, teachers are helped with their assessment and grading as well as it guides the students throughout their learning process by utilizing automatic assessment tools. This study conducted a systematic mapping study to obtain an overview of the existing approaches for K-12 computing education. A total of 14 approaches were identified, focusing on the analysis of the code crafted by the students inferring computational thinking competencies related to algorithms and programming. Only all available published articles on Scopus, the largest abstract ad citation database of peer-reviewed literature, in the English language, related to the assessment of algorithms and programming concepts were utilized in the study. The researchers primarily focused on K-12 education, where the approaches could also be utilized in other stages of education, including higher education. The researchers found 23 articles that are relevant and describe 14 different approaches that are mainly developed to assess code created with Scratch. Nevertheless, while some techniques also examine subjects like design and creativity, most approaches only examine aspects directly connected to algorithms and

programming. The methods frequently offer feedback in the form of a score based on the analysis of the code, including binary or polytomous ratings for individual sections or concepts, as well as composite scores offering a broad conclusion. According to the study's findings, eight techniques have been automated to support the teacher; some of these approaches also give feedback directly to the learners. The study concluded that a larger range of block-based programming languages needed such support and that there was a lack of agreement on the assessment criteria and instructional feedback. Moreover, the researchers also concluded that there is a lack of contextualization of these approaches within the educational setting to provide more thorough feedback covering also concepts and practices that may be challenging to be assessed automatically. The researchers suggested a need for further research toward a consensus on the assessment criteria and instructional feedback that could support the implementation of computing education in K–12 schools.

Methods

Research Design

The researchers used a quasi-experimental research design in conducting this action research. Descriptive methods were employed to discuss and interpret mean analysis and nominal descriptions of time-stamping. Descriptive-survey design is used to describe the observable variables and its components (Mendoza, et al., 2023). Considerably, a simple phenomenological design was used to understand user experience to augment Technology Acceptance Model (TAM).

Participants of the Study

The study selected five (5) faculty members of the Department of Management Studies as the purposive sample element of the study. They used the system to prepare their grades and print their Report of Ratings.

Findings and Action Research Narrative

Adoption and Implementation Process

The selected faculty members of the Department of Management Studies at the Cavite State University-CCAT Campus were still preparing their report of rating manually. The authors developed an automated system where faculties can input the students' grades, automatically compute their final grades, and generate a rating report ready to be printed. This action research utilized the full potential of the Excel software. Alpha testing was done to determine whether the faculty could use the system in their actual grading sheet preparation. The system was evaluated using the Technology Acceptance Model (TAM), which determines the perceived usefulness and ease of use. Time stamping was also done to compare the time efficiency in the preparation of the grading sheet with the use and without the use of the developed system.

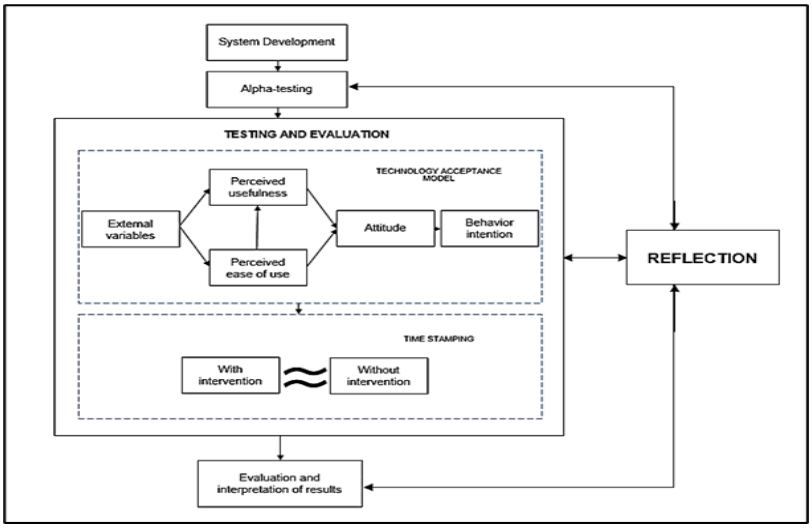

Figure 1. Conceptual framework

Intervention Assessment

Table 1 showcases the perceived use of Cavite State University - CCAT accessible ROR generator Excel sheet. The results reveal that using the e-class record makes work easier to compute grades. The participants find the e-class record useful in work as a professor/instructor with the same mean value of 4.80 with the description of highly agree. In contrast, the use of the e-class record system helped them to accomplish work quickly, also the use of e-class records improved productivity, with the same mean value of 4.60, which represents it as highly agree in terms of the performance of the e-class record system the participants answered that it makes them improved their performance. Considerably, the findings revealed that the per perceived use of Cavite State University - CCAT accessible ROR generator excel sheet, with a grand mean of 4.64 which describes as highly agree. The result means that there is a high level of work proficiency, and this would give impact to professional self-development of the instructors/professors in the utilization of modern technology.

Table 1. Perceived Use

Variables	Mean	Description
Using the e-class record system helps me to accomplish work more quickly	4.60	Highly Agree
Using an e-class record system will improve work performance	4.40	Highly Agree
Using e-class records will improve productivity	4.60	Highly Agree
Using e-class records will make work easier to grade computations	4.80	Highly Agree
The e-class record useful in work	4.80	Highly Agree
Grand Mean	**4.64**	**Highly Agree**

Table 2 presents the perceived ease of use of the Cavite State University - CCAT accessible ROR generator Excel sheet. The results imply that the use of e-class records was easy, with a mean score of 4.60 which describes as highly agree. The participants answered that they easily learned to use the e-class record. They said they could easily customize and do what they want to do in the system with a mean score of 4.40, with the description highly agree, while the participants somehow find the e-class record system confusing and eventually understand how to use it and somehow easy to familiarize with the features and adapt in the usage of e-class record with the mean score of 4.20 with the description of agree. Consequently, the results show that the overall perceived ease of use of the Cavite State University - CCAT accessible ROR generator Excel sheet with a grand mean value of 4.90 with the description of highly agree, revealed that they highly agreed on the variables, which concluded that the participants had developed a positive attitude and set their goals in establishing a smooth procedure flow in initializing the e-class record system.

Table 2. Perceived Ease of Use

Variables	Mean	Description
Learning to use the e-class record is easy	4.40	Highly Agree
I find it easy to use the e-class record	4.40	Highly Agree
Interaction and user experience with the e-class record is very clear and understandable	4.20	Agree
It is very easy to familiarize the features and adapt to the usage of e-class record	4.20	Agree
The use of e-class records easy to use in general	4.60	Highly Agree
Grand Mean	**4.36**	**Highly Agree**

Table 3 reveals the user acceptance of Cavite State University - CCAT accessible ROR generator Excel sheet. Out of five faculty members who participated, the result denotes that the e-class record is an acceptable intervention for improvement and to be used by the campus faculty members with the same total mean value of 4.80, representing it as highly agree. The total grand mean of user acceptance is 4.80, representing it as highly agree. Therefore, it concluded that there is a successful and effective intervention which is the use of the e-class record among the faculty on the campus, which would promote a vast measure of the process of the outcomes of this intervention implemented.

Table 3. User Acceptance

Variables	Mean	Description
This e-class record is an acceptable intervention for improvement	4.80	Highly Agree
This e-class record is an acceptable intervention to be used by faculty members of the campus	4.80	Highly Agree
Grand Mean	**4.80**	**Highly Agree**

Table 4 shows the time stamping (in minutes) and comparing "with intervention" and "without intervention." It shows that in the preparation of grades with intervention or with the use of a developed system, traditionally, the participants consumed a cumulative usage time of 1:24:12, while using the intervention or using the e-class record system garnered an average cumulative usage time of 58:20.8, this proves and implies that the intervention employed by the researchers is efficient and save 0:25:51 of time. It revealed the efficiency with regard to the time stamping with intervention. This meant that the goal of setting the intervention, which was the use of e-class records had achieved which had the desired result.

Table 4. Time stamping of "with intervention" and "without intervention"

ACTIVITIES	WITHOUT INTERVENTION						WITH INTERVENTION					
	Subj 1	Subj 2	Subj 3	Subj 4	Subj 5	Mean	Subj 1	Subj 2	Subj 3	Subj 4	Subj 5	Mean
Computing for raw grades	13:00.0	08:00.0	15:00.0	45:00.0	59:59.0	**28:11.8**	10:00.0	05:00.0	20:00.0	20:00.0	59:59.0	**22:59.8**
Computing for final grades	07:00.0	10:00.0	15:00.0	10:00.0	10:00.0	**10:24.0**	05:00.0	05:00.0	20:00.0	05:00.0	00:00.0	**07:00.0**
Class record printing	05:00.0	05:00.0	20:00.0	10:00.0	30:00.0	**14:00.0**	02:00.0	03:00.0	20:00.0	05:00.0	30:00.0	**12:00.0**
ROR preparation	05:00.0	08:00.0	10:00.0	10:00.0	59:59.0	**18:35.8**	02:00.0	05:00.0	20:00.0	03.00.0	00:00.0	**06:45.0**
ROR printing	05:00.0	05:00.0	15:00.0	0:10	30:00.0	**13:00.0**	02:00.0	03:00.0	20:00.0	10:00.0	13:00.0	**09:36.0**
	CUMULATIVE USAGE TIME					**1:24:12**	**CUMULATIVE USAGE TIME**					**58:20.8**

Table 5 reveals the challenges encountered using the Cavite State University - CCAT accessible ROR generator Excel sheet. The participants mentioned that using the e-class record system resulted in a more efficient result. It is recommended to have more range of knowledge and learning among the faculty in the use of the e-class record system that is free from mistakes in putting the data on the system for not just efficiency and effectiveness that needs consideration but also the accuracy of the data input for a well-balanced time of work.

Table 5. Intervention Observation: Challenges

Lack of knowledge of modern technology among the faculty
Lack of engagement and motivation on the use of e-class record
Lack of time management in recording the data on the e-class record
Lack of accuracy of formula on data on the e-class record

Conclusion

Based on the findings, the following conclusions were drawn:

1. Majority of the participants highly agreed with the use of the e-class record system. The result means that there is a high level of work proficiency, and this would give impact to professional self-development of the instructors/professors in the utilization of modern technology.
2. In terms of perceived ease of use of e-class record, it revealed that they highly agreed on the variables, which concluded that the participants had developed a positive attitude and set their goals in establishing a smooth flow of the procedure in initializing the e-class record system.
3. Based on the result, it showed that most participants highly agreed with the acceptance of the use of the e-class record for their improvement and for the sake of the users on the campus. Therefore, it concluded that there is a successful and effective intervention which is the use of the e-class record among the faculty on the campus, which would promote a vast measure of the process of the outcomes of this intervention implemented.
4. With the result given, revealed that there was efficiency with regard to the time stamping with intervention. This meant that the goal of setting the intervention which was the use of e-class records had achieved which had the desired result. Further, this would also be an aspect of promising approaches in putting into practice the intended interventions which would help the faculty improve their target goal of efficiency in recording grades.

Recommendation

The researchers recommend the following programs based on the findings and conclusions:

1. It is recommended to have further study be initiated in utilizing the output of the e-class record system so they could develop further their skills, training, and mentoring sessions on the use of the said system;
2. To further enhance the smoothness and comprehensive use of the e-class record, it is highly recommended to have a mixed balance recording of the data on the e-class record not just for the easy application of the system but also the passion-based learning where the faculty would be working together in the analyzation and recording of data on the e-class record;
3. It is recommended that there should be more assessment and evaluation tools in the acceptability of the interventions, not just for improvement or utilization but also for the conduct of a systematic review of the interventions that focus not only on the efficacy and effectiveness but also on the feasibility of a highly technological approach; and
4. Since the use of an e-class record system resulted in a more efficient result, then it is recommended to have more range of knowledge and learning among the faculty in the use of the e-class record system that is free from mistakes in putting the data on

the system for not just efficiency, effectiveness that needs consideration but also the accuracy of the data input for a well-balanced time of work.

Acknowledgement

The researchers would like to supremely acknowledge God, who has created the universe and all the creatures and has continuously lent the researchers' life and provided everything and who has provided the following individuals who have helped them realize this humble action research: To our co-researchers and collaborator from the Department of Management Studies and Research and Extension Office, who have dedicated and spared time in drafting the action research; To our Beloved Cavite State University – Cavite College of Arts and Trades, headed by our ever-supportive Campus Administrator, Dr. Lauro B. Pascua, for his encouragement and unwavering support, *per aspera ad astra!*

"MABUHAY ANG PANANALIKSIK, PARA SA MANINGNING NA CVSU!"

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