PROJECT TALA (TECHNOLOGY-BASED ACTIVITY AND LEARNING ASSISTANT): AN INTERVENTION TO MAXIMIZE PERFORMANCE OF ICT LEARNERS IN MODULAR DISTANCE LEARNING

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ABSTRACT

This study aimed to develop an intervention to maximize the performance of ICT 12-Shannon learners in Computer Programming during the first semester of S.Y. 2021-2022. The study involved 56 learners to gather data and utilized the descriptive research design. Based on the findings, learners experienced difficulties in Computer Programming specifically in one of the learning competencies during the second quarter which is apply basic of java language. To address this problem, the researcher utilized chatbot technology and came up with Project TALA (Technology-based Activity and Learning Assistant) which provides interactive and immediate responses when prompted by learners and delivers the content of the learning activity sheet. It is an automated instructional material that can be accessed by learners through the messenger application. The learner should provide the lesson code to prompt TALA to deliver the lesson. There will be two options on how to go through the lesson; text/image format and video format. The content is based on the learning activity sheet for week six of the second quarter with the learning competency of apply basic of the java language. TALA can also provide supplementary learning materials and additional examples of the lesson. Learners are expected to give their answers to the activity in real-time. After the implementation of Project TALA, it was revealed that there is an improvement in the performance of the learners as revealed by Pre-Test and Post-Test results. With this result, the researcher recommends TALA be replicated in other learning areas.

Keywords: intervention, technology-based, chatbot, interactive

INTRODUCTION

When the Covid-19 pandemic hit the world in 2020, schools were closed and students' education was moved to their homes. Teachers had been able to teach students at a distance. Digital technology played a very important role, enabling both synchronous and asynchronous communication to be used in teaching and learning. Its primary goal is to modify the way teachers and students gather, access, evaluate, present, and communicate information.

Instructions when given using technology can help create flexible learning environments where teachers can truly personalize learning and foster an environment where students are involved in their education at their most comfortable time and venue. It can offer timely communication and can serve multiple students simultaneously.

A chatbot is one of many options that technology offers. It is defined as computer programs replicating human-like conversations using natural language structures (Garcia Brustenga et al., 2018; Pham et al., 2018). It can be a powerful virtual assistant which can also be

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utilized for educational purposes. It could be deployed over messaging apps like Facebook Messenger and the like, custom school apps, or the school's website when available to facilitate automatic around-the-clock interaction and communication.

Lemery Senior High School has many enrollees utilizing two distance learning modalities namely online distance learning and modular distance learning, in modular distance learning, students are provided with a hard copy of their learning materials, and their answer sheets are retrieved regularly. However, this has consumed so many resources in terms of the reproduction and sorting of learning materials. Moreover, teachers also experienced delays in checking students' outputs and giving them feedback as they wait until the answer sheets are retrieved, resulting in difficulty keeping track of students' learning and making effective instructional decisions that significantly impact students' performance. As this has been observed especially in learners in modular distance learning, Project TALA (Technology-based Activity and Learning Assistant) is an intervention proposed to provide a more interactive way and immediate support to Grade 12- ICT learners in Computer Programming specifically section Shannon in accomplishing their learning activities to easily monitor and maximize their performance.

OBJECTIVES OF THE STUDY

This study primarily aims to: 1. Determine the level of mastery of ICT 12-Shannon in Computer Programming (Java); 2. Identify the difficulties encountered by ICT 12 Shannon in Computer Programming; 3. Propose an intervention to enhance the level of mastery of ICT 12-Shannon in Computer Programming; 4. Determine the effect of the implementation of Project TALA as perceived by ICT 12-Shannon learners in Computer Programming (Java).

METHODOLOGY

This research study used Descriptive Design. A questionnaire was used to gather the necessary data. The respondents of the study were composed of 37 males and 19 females with a total of 56 students of ICT 12-Shannon. No sampling was done among the respondents of the study to gather the exact data. Weighted mean and mean percentage scores were also used as statistical tools.

The research instrument used was a questionnaire. To measure the difficulties encountered by ICT 12 Shannon in Computer Programming as well as the effect of the implementation of Project TALA as perceived by ICT 12-Shannon learners in Computer Programming (Java) weighted mean was used. On the other hand, the mean percentage score was utilized to determine the level of mastery of the respondents among Learning Competencies in Computer Programming during the first semester.

Likewise, the researcher seeks consent from the District and School heads to conduct the study. Parental consent is also requested from each of the respondents before they were given the questionnaire. The research instrument was used to undergo content validation and reliability testing to ensure that the data that will be gathered is reliable.

RESULTS AND DISCUSSION

1. Level of mastery of ICT 12-Shannon in Computer Programming (Java)

Table 1 presents the level of mastery of ICT 12-Shannon among the learning competencies in Computer Programming during the first semester. The data shows that in Quarter 2, there is near mastery in apply basics of java language which has the least mean score of 23.45 and 73.45 mean percentage score among the learning competencies during the first semester.

This could mean that the learning competency that deals with java programming language is challenging among learners. This shows that learners experience difficulties in creating their program due to limited examples before the hands-on activities which is parallel to the idea of Rusminah et.al (2018) that learners perform poorly while learning programming courses due to insufficient examples provided to them.

Table 1
Level of Mastery of ICT 12- Shannon in Computer Programming (Java) during First Semester

Learning Competencies	Mean Score	Mps	Remarks
Quarter 1			
1. Lead workplace communication (LWC)	37.39	87.39	Mastered
2. Lead small teams (LST)	38.44	88.44	Mastered
3. Develop and practice negotiation skills (DPN)	34.11	84.11	Mastered
4. Solve problems related to work activities (PRW)	24.02	74.02	Nearly Mastered
5. Apply quality standards (AQS)	37.28	87.28	Mastered
6. Use relevant technologies (URT)	24.38	74.38	Nearly Mastered
7. Apply quality standards (AQS)	24.15	74.15	Nearly Mastered
8. Perform computer operations (PCO)	24.15	74.15	Nearly Mastered
Quarter 2			
9. Access information using computer	24.00	74.00	Mastered
10. Maintain computer equipment	24.22	74.22	Mastered
11. Performing Object Oriented Analysis and Design: Apply Basics of Java Language	23.45	73.88	Nearly Mastered

2. Difficulties encountered by ICT 12 Shannon in Computer Programming

Table 2 presents the difficulties encountered by ICT 12- Shannon learners in Computer Programming. The data shows that the learners strongly agreed that the absence of an interactive medium to engage interest in learning is their most encountered difficulty which got the highest rank with a 3.84 weighted mean. It indicates that learners can learn more if teachers utilize interactive media in the delivery of instruction.

Table 2
Difficulties encountered by ICT 12 Shannon in Computer Programming

Difficulties Encountered	Weighted Mean	VI	Rank
1. Ineffective time management in reading the learning materials and answering the activities	3.32	SA	6
2. Lack of real-time feedback from teachers	3.65	SA	4
3. Lack of supplementary examples to clearly understand the lesson	3.72	SA	2
4. Absence of interactive medium to engage interest in learning	3.84	SA	1
5. Limited instructions to easily understand how to do the learning activities	3.69	SA	3
6. Limited time of access to Learning Activity Sheets and Weekly Home Learning Plan	3.54	SA	7
7. Lack of well-timed communication on performance and learning progress	3.31	SA	5
Average Weighted Mean	**3.58**	**SA**	

This could also mean that to be able to enhance Grade 12-Shannon learners' performance in Computer Programming the teacher should devise ways on incorporating interactive activities in modular distance learning which is similar to the idea of Allen (2021) who has proven that interactive learning increases learner's performance and help them learn independently. Moreover, he mentioned that it also improves learners' retention of material and promotes self-directed learning. In addition, Grade 12- Shannon

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learners strongly agreed that limited time of access to learning activity sheets and weekly home learning plan is one of the difficulties encountered in the subject as supported by the lowest weighted mean of 3.54. It indicates that the learners have insufficient time in using the learning activity sheets. It could also mean that their given time is not enough to complete the different learning activities. With this, it can be inferred that some of the learners submit incomplete outputs due to time pressure which could affect the transfer of learning. This can be supported by the study conducted by George (2013) where he recommended that learners should be given a study timetable long enough for effective academic exercises. It is found that there is an improvement in the academic performance of the learners with long study times.

In general, the average weighted mean of 3.58 revealed that the learners strongly agreed that they experienced some difficulties taking computer programming subjects. This indicates that the learners can further improve their performance in programming if the identified difficulties are addressed properly. Moreover, it also implies that the teachers should devise strategies that are parallel to the needs of the learners. This shows that appropriate intervention must be given to be able to improve the learning delivery in computer programming subject. This is supported by the study of Othman et.al (2010) who concluded that learning interventions are useful in improving learners' academic performance and should be considered a routine tool in the teaching and learning process.

3. Proposed intervention strategy to enhance the level of mastery of ICT 12-Shannon in Computer Programming

To enhance the level of mastery of ICT 12-Shannon in Computer Programming, Project TALA (Technology-based Activity and Learning Assistant) is proposed by the researcher. It is an automated instructional material that can be accessed by learners through the messenger application. The learner should provide the lesson code to prompt TALA to deliver the lesson. There will be two options on how to go through the lesson; text/image format and video format.
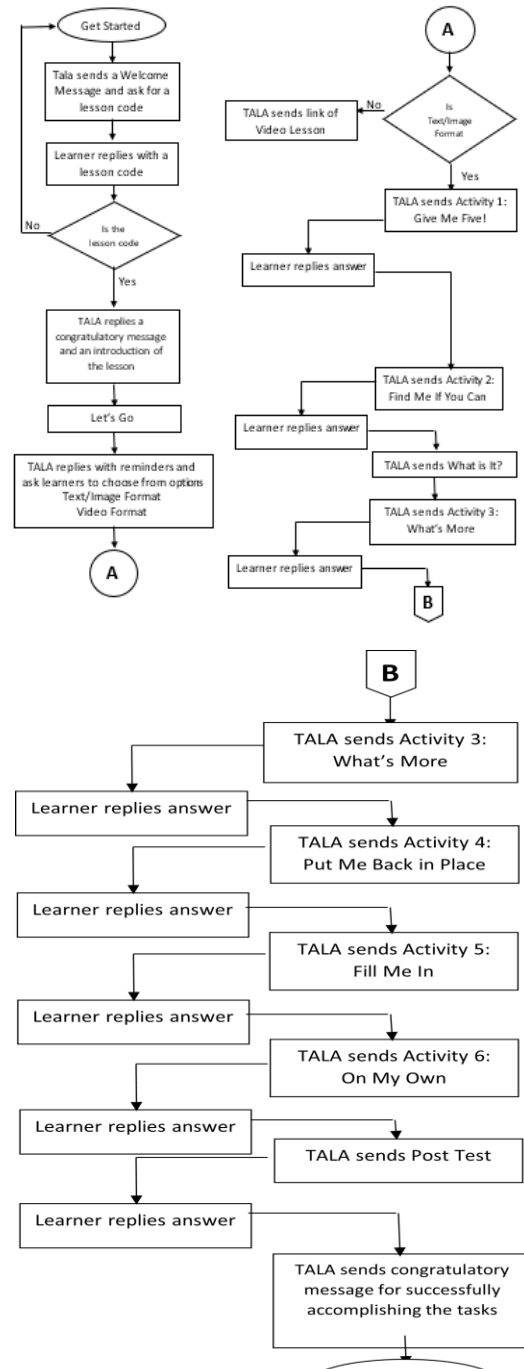

Figure 1. Flowchart of TALA (Technology- based Activity and Learning Assistant)

Figure 2. Use Case Diagram of TALA (Technology-based Activity and Learning Assistant

4. Difficulties encountered by ICT 12 Shannon in Computer Programming

Table 3
Difficulties encountered by ICT 12 Shannon in Computer Programming

Effects of the Implementation of Project TALA	Weighted Mean	VI	Rank
1. Acquire advanced learning in Computer Programming	3.32	SA	6
2. Motivate to complete different learning tasks	3.65	SA	4
3. Promote time management in accomplishing different learning tasks.	3.72	SA	2
4. Improve the quality of performance outputs	3.84	SA	1
5. Reduce academic stress in completing assigned learning activities	3.69	SA	3
Average Weighted Mean	**3.58**	**SA**	

Table 3 presents the effects of the implementation of Project TALA as perceived by ICT 12-Shannon learners in Computer Programming (Java). The data shows that the learners strongly agreed that TALA improves the quality of performance which got the highest rank having a weighted mean of 3.84. It indicates that TALA, when used, can contribute to increasing the level of performance of the learners. This could also mean that TALA contributes to alleviating the difficulties encountered by ICT 12-Shannon in doing their activities in computer programming. This is like the idea of Okonkwo (2021) who cited that the primary advantage of implementing a chatbot system in education is that it will improve students' learning performance.

CONCLUSION

Based on the findings the following conclusions were drawn. The study revealed that ICT 12-Shannon learners experienced difficulties in Computer Programming specifically in one of the learning competencies during the second quarter of the first semester which is apply basics of java language. The absence of an interactive medium to engage interest in learning greatly impacts their performance. Moreover, they need additional examples to clearly understand the lesson. The implementation of Project TALA (Technology-based Activity and Learning Assistant) served as an effective intervention to maximize the performance of ICT learners in modular distance learning. The implementation of Project TALA improved the quality of performance of ICT 12-Shannon learners in computer programming.

RECOMMENDATION

Given the findings and conclusions drawn, the researcher recommends the following:

1. Further evaluation of Project TALA using a quasi-experimental approach.
2. Other teachers should replicate TALA (Technology-based Activity and Learning Assistant) as an intervention to maximize the performance of learners in other subjects. Further study as well as consistent monitoring and evaluation should be conducted to enhance the project.

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REFERENCES

Allen M. (2021) Interactive learning: methods & tools to improve collaboration. https://jimmyesl.com/interactive-learning/

Dutta, D. (2017) Developing an intelligent chatbot tool to assist high school students In learning general knowledge subjects. https://smartech.gatech.edu/handle/1853/59088

Garcia Brustenga, G., Fuertes-Alpiste, M., & Molas-Castells, N. (2018). *Briefing paper: Chatbots in education.* eLearn Center, Universitat Oberta de Catalunya. https://doi.org/10.7238/elc.chatbots.2018.

I. N. George & D. E. Ukpong (2013) Length of study-time behaviour and academic achievement of social studies education students at the university of Uyo https://files.eric.ed.gov/fulltext/EJ1067747.pdf

Jain, M., Kumar, P., et.al (2018). Evaluating and informing the design of chatbots. https://dl.acm.org/doi/10.1145/3196709.3196735

Keegan, M., Boyle, D., et.al. (2012). Turi: Chatbot software for schools in the Turing centenary. https://www.researchgate.net/publication/262288248_Turi_chatbot_software_for_schools_in_the_Turing_centenary

Othman, N., (2020). The impact of electronic gadget uses with academic performance among secondary school students. Prac Clin Invest 2(2): 56-60. https://www.researchgate.net/publication/338791252_The_Impact_of_Electronic_Gadget_Uses_with_Academic_Performance_among_Secondary_School_Students

Rosminah, S., Derus M,.et.al, (2018). Difficulties in learning programming: Views of students. https://www.academia.edu/4230359/DIFFICULTIES_IN_LEARNING_PROGRAMMING_VIEWS_OF_STUDENTS

Serrano, J., Ph.D., Belegal, J., et.al (2021). Ask Iska and IskOU: Analysis of UPOU's chatbot for information support services. https://www.researchgate.net/publication/357826481_Ask_Iska_and_IskOU_Analysis_of_UPOU's_Chatbot_for_Information_Support_Services

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