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Research Article

The New Norm of Learning: Implementing Learner-Centered Education with Technology Students

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ABSTRACT

This action research was conducted to determine the effect of interactive learning techniques in the motivational learning process among Bachelor of Science in Industrial Technology (BSIT) students of Cavite State University – CCAT Campus. The study utilized mixed research designs in the conduct of the study. Results showed an increase in students' cognitive, affective, and psychomotor domains after the intervention. This action research recommends utilizing coordinated-tandem teaching to maximize teaching delivery and address a huge volume of students and orienting the students to ICT/multimedia equipment to maximize online-lecture classes among BSIT Students.

Keywords: *Action research, Industrial Technology, Interactive-learning, Intervention*

Introduction

In times of crisis, the teaching and learning process at Cavite State University-Cavite College Arts and Trades takes on a new form. Schools and colleges must be persistent and come up with creative strategies to carry on with learner-centered education when crises and disasters (both man-made and natural) strike. The transition to online learning modalities to reduce the risk of face-to-face interaction is one new reality brought about by the global health crisis. The pandemic has brought about universities to interchange from in-individual teaching to online delivery. During school lockdowns, students at the majority of Philippine universities, including Cavite State University - Cavite College of Arts and Trades and particularly the Department of Industrial Technology, have turned to online study. Yet, this abrupt change has created issues, particularly for students without access to technology. Due to the pandemic, online learning is being implemented, which has caused the gap between those who have connectivity and those who do not to widen. Due to access and internet availability, teachers and students have found it difficult to maintain academic attention (Chang, 2013).

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The Department of Industrial Technology (DIT) has a wide range of specializations, including Automotive Technology, Drafting Technology, Electrical Technology, Electronics Technology, Fashion and Apparel Technology, Heating, Ventilating, Airconditioning and Refrigeration Technology, Mechanical Technology, Stationary Marine Technology, and Welding and Fabrication Technology. As a result, interactive teaching is not given much attention.

Through this, the researchers try to implement learner-centered education to make the class more engaging. Each faculty member and technology student's strategy will be improved as a result of this action research, which will be helpful to both groups.

Objectives

Generally, this action research aimed to determine the effect of interactive-learning techniques in the motivational learning process among BSIT students of Cavite State University – CCAT Campus.

Specifically, the researchers aimed to:

[1] design and implementation of learner-center strategies;
[2] evaluate the implemented learner-center strategies in terms of;
   a. cognitive;
   b. affective;
   c. psychomotor;
[3] identify challenges in the implementation of learner-centered strategies; and
[4] craft a possible action plan to address the challenges encountered in the conduct of learning intervention.

Review of Related Studies and Literature

Sivri and Sahin (2020) explored one of the impressive rising research areas of the educational world is learner-centered instructional methods and school success. The aim of this study is to investigate how the adoption of learner-centered psychological ideas by administrators and teachers and their opinions of the effectiveness of their schools relate to one another. The report offers details about quantitative research methodology. The sample for the study, which used the survey model, included 429 participants from 32 public secondary schools, including 364 teachers and 65 school administrators. The "Effective School Scale" and the "Learner-Centered Educational Principles Adoption Scale" were used to collect the study's data. Parametric and non-parametric analyses were carried out based on the distribution of the collected data. The findings showed that administrators and teachers have highly developed learner-centered psychological principles. The participants' adoption of a learner-centered approach and their opinions of the efficacy of their schools were found to be significantly and positively correlated. Finally, the findings revealed that participants' judgments of school success differed dramatically depending on their commitment to learner-centered understanding. According to one interpretation, teachers and school administrators, who serve as the main implementers of educational policies, must demonstrate a certain level of adaptability to the change initiatives that put the student at the center of educational processes. The research in this area can help teachers, administrators, and policymakers boost school performance by taking a learner-centered approach.

Badjadi et al. (2020) said that learner-centered education is thought to have a number of learning benefits, research indicates that instructors' attitudes and behaviors are key in developing the program's fruitful outcomes. Since the start of a shift in education represented by the learner-centered reform a decade ago, this study investigates the adoption of learner-centered education and how it has been implemented in the teaching of second languages by university professors. In doing so, a survey was sent to 128 instructors who were chosen at random. The Statistical Package for Social Sciences (SPSS) 16.0 program was used to perform descriptive and inferential statistical analysis on the data gathered. Conversely, a qualitative analysis of interviews was conducted. An overview of instructors' perspectives toward learner-centered education and the degree to which it was applied in their courses is given by the quantitative analysis of data. More significantly, by connecting the learner-centered education principles' conceptual character to teachers' perceptions and actions in a specific setting, the analysis of qualitative interview results presents a

"contextualized" framework. The results shed light on how dynamically college students' second language acquisition demands are met. The report also discusses the challenges of creating teacher preparation programs that support second language acquisition in higher education in the Middle East and North Africa

Marwan et al. (2017) heard numerous claims about the effectiveness of learner-centered teaching strategies across all disciplines, this research was started. By putting a learner-centered teaching theoretical framework into practice in an EFL classroom, it aims to investigate if such a claim is accurate. A number of students from a vocational higher education institution and an English teacher participated in a qualitative design. Overall, the results of this study demonstrated that using this learner-centered teaching paradigm could affect students' learning. Their education became more purposeful, fascinating, and democratic. In addition to this beneficial development, it was found that teachers' comprehension of how to execute this framework was still restricted, which caused inconsistent application of all parts of the learner-centered teaching method. This study could shed insight on matters particular to this field of study that the framework does not address. Consequently, it resulted in a longer framework. The study's conclusions can be applied by educators who wish to employ a learner-centered teaching strategy.

Siswoyo et al. (2020) explored interactive learning tools based on augmented reality and active learning strategies used in primary schools. This study aimed to produce interactive learning media topic rotation and earth revolution learning media based on augmented reality is legitimate, usable, and productive. The independent variables were interactive learning media and active learning strategy, while the dependent variable was a primary school in the new normal era. The authors used interview, observations, questionnaires, and learning outcomes test to collect the data. This study is development research that used the ADDIE development model. The sample size utilized in this study was 20 students, and only individual experiments were conducted by the developer at the residence and small-group tests. This study used primary and secondary data. Specifically, primary data were gathered through the respondents, while secondary data were collected from previous studies. The findings revealed that active learning techniques are simple in primary schools. Students in grade VI at SDN Kamal Madura region can better comprehend the idea of the earth and moon rotating with the use of this educational material. Interactive educational tools can boost students' enthusiasm to study. Since educational media are designed to support students in the learning process, whether educators are present in the educational process, integrating instructional media with augmented reality can effectively provide learning whenever and wherever students want to carry out the learning process. It can encourage students to adopt a critical mindset when considering issues and events that arise in daily life. The student learning outcomes test results for the classical completeness in small group trials were 100% in the complete classical category. Considering this, it can be said that creating interactive augmented reality learning content based on active learning techniques is beneficial. Student response questionnaire answers from the small group trial can be used to determine the viability of augmented reality-based interactive learning material. This also attributes on the learning patterns as reflected by gender as cited in the literature used by Mendoza and Tadeo (2022).

Uppal and Ali (2022) conducted a study about the importance of interactive content in a pervasive learning environment in a new normal setting. This study aimed to examine important facets of interactivity in an e-learning environment and investigate how interactivity in a material affects learners' perceptions of quality. The main variables of the study were interactive content in a passive learning environment in the new normal. The researchers utilized questionnaires to collect data from the respondents. The authors used a five-point Likert scale for all questions in section two. The data were gathered from 430 students and most of them had already experienced e-learning materials. This study used primary and secondary data. Specifically, primary data were gathered through the respondents, while secondary data were collected from previous

works of literature. The author measured the impression of e-learning quality using the ELQ model to consider the system, information, and service aspects. The findings revealed that the course website, tangibility, and learning materials are important. This implies that learners believe the e-learning content is more superior quality, especially if the content is more engaging. This complies with the literature's assertion that the interactivity raises quality perception of the instructional materials. The researchers suggested that high-quality online courses interactivity raises student performance levels, increased learning results, motivation, and contentment with a less engaging learning environment environments.

Sirait et al. (2021) studied the use of interactive learning tools based on YouTube for learning English in the new normal era. The purpose of this study was to identify the interactive learning materials based on YouTube as well as to see how instructors and students react to its utilization. The main variables of the study were YouTube-based interactive learning media in learning English in the new normal. The researchers employed interviews and observations to collect the data. The population the authors wanted to study were the students in the seventh semester of English instruction who are familiar with YouTube. The sample size that the researchers used was six students. This study used primary and secondary data. Specifically, primary data were gathered from the participants, while secondary data were collected from previous works studies. The author used a qualitative research design to describe and analyze occurrences, events, social actions, and beliefs. A thematic analysis was used in this study to analyze the data. The authors found out that UMN AW English language education students used interactive multimedia learning resources based on YouTube mostly for accessing news media. YouTube has emerged as an alternative platform for learning English, with both good and negative emotions being expressed by educators and students. The researchers suggested that the efficacy and characteristics of YouTube as a learning tool for English are more commonly utilized by students for beneficial purposes and can boost their credibility. The channel may be used as a portfolio for students' works and wholesome pastimes in the form of written works, images, poems, and videos, among other media, so that it not only satisfies the demand for information, communication, and enjoyment.

Sahronih et al. (2019) conducted a study entitled the effect of the use of interactive learning media environment-based and learning motivation on science learning outcomes. The main objective of this research is to ascertain the impact of interactive learning media, environment-based learning motivation, and learning outcomes on science. Students in Grogol Petamburan District's Class V SDN Wijaya Kusuma 07 West Jakarta served as the study's target group. There will be 61 pupils in total for the classes that will serve as the control and experiment classes in West Jakarta City. It was done by drawing stages two classes V with parallel classes for the multi-stage random sampling technique (VA and VB). The study used primary and secondary sources in collecting data. The primary data comes from the respondents who answered the questions in questionnaires. Secondary data comes from the internet, journals, and any related sources. Test necessities examination is finished by testing the ordinariness and homogeneity. The normality test is finished by utilizing the Lillifors test. Information examination is performed utilizing two-way Variation Investigation (ANAVA) through the F-test to test the principal impact speculation. Then likewise testing the speculation of connection impact and a straightforward impact. Gathering learning inspiration information utilizing a survey questionnaire with a Likert Scale, while the science learning results from information utilizes a learning result test that has been approved and tested. Findings and conclusions discussed that the results of the main hypothesis test results show that environment-based intelligent learning media is all the more effectively used in science learning. Interactive gaining knowledge of substances are notion to be essential in contemporary lecture rooms due to the fact millennial students, who are responsible for learning, are familiar to using technology and do not get easily bored. The results of the second hypothesis test demonstrate the relationship between learning media and motivation, demonstrating

that motivation for learning will improve the consumption of learning media. It also demonstrates how choosing the right educational tools can influence students' intellectual development, as seen in how well they learn science, for instance. The third hypothesis test demonstrates that students who learn utilizing interactive learning media have higher average values than student groups who learn using non-interactive learning media student groups with strong learning motivation. This is due to the fact that learning through interactive media can enhance students' ability to engage by moving through various phases, including the phase of the attention. retention. reproduction. and the stage of motivation. Based on the fourth hypothesis, students who learn using interactive media-based learning media perform on average worse than students who learn using non-interactive learning media on student groups with low learning motivation. Theoretically, this is demonstrated by the fact that students with poor motivation typically delay their participation in a learning process and wait for outside help. This is ideal for learning activities that employ passive learning media and require greater supervision and guidance from the teacher throughout the learning process. In contrast, non-interactive learning mediums demand independence from the learner so that the motivation of learning took priority over those of the individual.

Banayo (2021) conducted a study entitled online education as an active learning environment in the new normal. This study tested students' awareness towards collaborative-constructivist learning experience in online education of the Laguna State Polytechnic University (LSPU) throughout 'new normal' learning modality because of COVID-19 pandemic. The author used descriptive-survey research using the Online Learning Environment Survey (OLLES) questionnaire comprising the seven (7) components namely: student collaboration, computer competence, active learning, teacher support, information design and appeal, material environment, and reflective thinking and the Community of Inquiry (COI) survey on the online learning experiences on social, teaching, and cognitive presence. Through google form, the researchers accumulated information to 106 fourth 12 months college students in College of Teacher Education (CTE). The responses were downloaded as CSV file and converted to Microsoft Excel file for further statistical analysis. The author used quantitative research to summarized the numerical findings while descriptive research design was used to examine the data. The study used primary and secondary sources in collecting data. The primary data comes from the respondents who answered the questions in questionnaires and secondary data comes from the internet, journals, and any related sources. The author used one-shot survey design and it was sent to respondents at one specific time through google forms and emails. Findings revealed learners used communication and personal devices to their courses online and they usually ask for help to their classmates that resulted in being cooperative by supporting each other. Next, learners are capable engaging in technologies when it comes to online learning environment and they used it to communicate to others to obtain information. Learners accept the important of feedback as an online learning environment. Feedbacks bring out to consider learning activities and increase their comprehension of the data presented. Learners considered digital material displayed such as; color, style, text, and many more. Also, they considered themselves as in charge to their online learning environment particularly in relevant support files that used in software applications. They appreciated the computers and internet on their online course. On the other hand, even they are contented in learning online, they still considered the advantage of learning traditionally. The authors concluded that learners perceived the online learners as favorable and view their learning experiences during the new normal as meaningful and collaborative-constructivist.

Methods

Research Design

A mixed research design was utilized in the conduct of the study. To characterize the participants' mean scores, this research used a descriptive design (Mendoza et al., 2023). The structuring of the intervention and participant analysis made heavy use of quasi-experimental

methods. To supplement and support the results of the last-mentioned design, inferential and observational designs were also used. This action research has a previous null hypothesis that states there are no appreciable changes between the variables being studied between classes using interactive, motivational learning methodologies and classes without receiving any intervention.

Research Instrument

Additionally, the authors used Likert-scale questionnaires, checklist, field and observation notes as research instruments as basis for data analysis. In support of calibrated and standard measure of variables the researchers have used the motivation-matrix of University of California Davis, Center for Educational Effectiveness as key research instruments in this action research.

Participants of the Study

The teachers used the two heterogeneous classes of BSIT for every two lecture subjects of the BSIT program offered on campus namely AUTO 50 as Auto electrical and electronics system and AUTO 55 as Engine overhauling and performance testing.

Results and Discussion

Adoption and Implementation Process

The authors aimed to look into strategies for enhancing students' learning experiences by utilizing the Google Suite as a primary delivery tool in instruction delivery through their collective and collaborative thoughts to understand and explore the dimensions of the new normal of learning. This action research examined the application of motivating interactive learning strategies prior to class discussion to investigate potential effects on students' motivation, engagement, and performance. Consequently, providing suggestive techniques to improve the delivery of the lesson in terms of technology education.

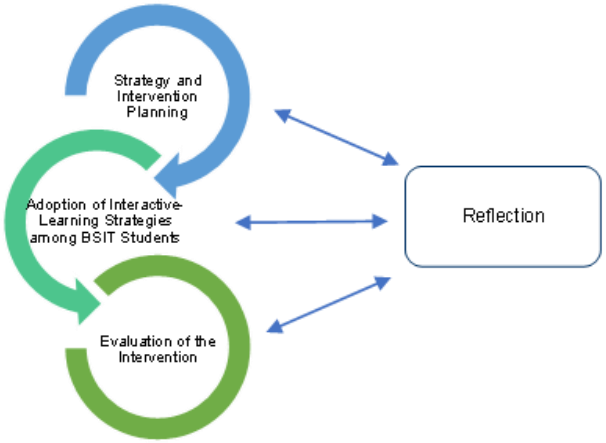

Figure 1. Ideation to Evaluation Framework

Intervention Assessment

Table 1. Teachers' Observation

Areas of Observation	Without Intervention	With Intervention
Class atmosphere of motivation	Students finish their work without valuing what they learn	Students are more engaged in activities and excited to do other on activity
Excitement among students / Fun environment towards learning / Class involvement and participation.	Students feel more pressure and tense to participate	Through group activities, the students are excited to collaborate with one another and share their ideas

Areas of Observation	Without Intervention	With Intervention
Clear understanding of the students toward concepts	Students need to read and understand the discussion to do activities	Students practice their skills while participating to group activities with their modules
Class comfortability of interaction	Students feel nervous during discussion and participation	Students think comfortably brainstorming with their groupmates
Attention of students / Stimulation of class curiosity and thinking	Students are bored in long discussion	Self-learning and collaborative learning help them conceptualize situation to the problem

Table 1 shows the teachers' observations across BSIT students with induced intervention and placebo classes. It generally shows that there were positive results of observed responses from the students such as the willingness of the students in class participation and engagement, confidence in sharing their ideas, and observed attentiveness to queries on observation, it is noted that there were positive observation in relation to class atmosphere, class involvement, concept understanding, comfortably for student attention.

Table 2. Students' Responses

	Variables	Without Intervention		With Intervention	
		Mean	Description	Mean	Description
Cognitive	I understood the concepts, ideas, and terminologies well	4.36	Highly Agree	4.64	Highly Agree
	I understood of subject concept and relevance to (Please put your course here example; Computer Engineering, Automotive) general practices	4.20	Highly Agree	4.63	Highly Agree
	Linking of subject concepts with the view of the competitiveness of my course	4.23	Highly Agree	4.73	Highly Agree
Affective	I am comfortable with socializing with classmates and other colleagues via online	4.33	Highly Agree	4.36	Highly Agree
	I cooperate peacefully and amicably with classmates or group mates.	4.53	Highly Agree	4.53	Highly Agree
	I empathize with my classmates during discussions and idea confrontation	4.33	Highly Agree	4.63	Highly Agree
Psychomotor	I following the procedures and instructions of the facilitator towards the subject	4.55	Highly Agree	4.59	Highly Agree
	I apply the subject skill in conceptualization of plan	4.31	Highly Agree	4.54	Highly Agree

Table 2 reveals the students' responses towards their experiences in their respective classes both from classes that have intervention and without the intervention of interactive motivational strategy. Generally, the students were motivated and participated more in classes with intervention as revealed by higher mean values compared to classes without intervention.

Table 3. t-test values of with and without intervention phases

t-test value	p-value	decision
3.83	0.01	Rejected

Table 3 shows the t-test results of the intervention conducted in this action research. It reveals that the t-stat value of 3.83 with a significant value of 1.76 is statistically significant following and complying with the critical value of 0.05. Hence, the null hypothesis that there is no significant difference among the means observed as caused by the intervention is thereby REJECTED.

It can be significantly inferred that the utilization of student-centered activity in the classes of BSIT101-A (Auto 50 as Auto electrical and electronics system & Auto 55-Lab as Engine overhauling and performance testing) is a causal determinant of the increased value of means, translating improvements in cognitive, affective and psychomotor domains and subvariables under study.

Table 4. Teachers' Observation: Challenges

There are numerous students in each class.
The familiarity of students with industrial and technology applications.

Table 4 shows the challenges that were observed by the teachers. It was identified that the number of students in the classes and the familiarity of students with industrial and technology applications were identified as key challenges.

Conclusion

The researchers conclude the following:

1. The DIT has implemented an intervention of utilizing teacher-centered activity in the classes of BSIT101 and BSIT301 (Auto 50 as Auto electrical and electronics system and Auto 55-Lab as Engine overhauling and performance testing).
2. There is an increase in the cognitive, affective, and psychomotor domains of students after the intervention.
3. It was identified that the number of students in the classes BSIT101 & 301, and the familiarity of students with industrial and technology applications were identified as key challenges.

Recommendations

Recommend the following:

1. It is recommended to utilize coordinated-tandem teaching to maximize teaching delivery and to address a huge volume of students; and
2. It is recommended to orient the students to ICT/multimedia equipment to maximize online-lecture classes among DIT Students.

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