



The Peril of Covid-19 in Health and Education: Effectiveness of Basic Electrical Wiring System Online Teaching

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Abstract

In recent years, online teaching has emerged as a prominent educational method, especially in response to global events such as Covid-19 pandemic that necessitated changes in traditional learning environments. Despite its challenges, the utilization of online teaching has shown remarkable benefits, particularly in student performance. Based on the pre-test results reflected that there are 11 student respondents, First Year Bachelor of Technical-Vocational Teacher Education (BTVTE) students of Mindoro State University taking the basic electrical wiring system before shifting to online mode achieved a "Fair" performance, and 9 of them gained a "Satisfactory" status. On the other hand, at least one of them out of 20 individuals obtained a "Poor" performance. The overall mean for the Pre-test of the study was 11.71 treated as "Poor" performance. The analysis of post-test outcomes revealed a significant level of achievement among the student respondents. Out of the total participants, 18 students were classified as "Outstanding," reflecting a high level of understanding and engagement with the course material. Additionally, 2 students earned a rating of "Very Satisfactory," while only one student received a "Fair" performance designation. These results culminated in an overall mean score of 27.52, which is categorized as "Outstanding." This data suggests that the transition to online teaching has not only maintained educational standards but has also fostered an environment in which a majority of students thrive academically. The interactive nature of online platforms fosters greater engagement and collaboration among peers, further enhancing the educational experience.

Keywords: Covid-19, Bachelor of Technical-Vocational Teacher Education, Electrical Wiring System, Mindoro State University, Online Teaching,

Introduction

Studying is an integral part of education that should be accomplished by the students. This helps build social skills, problem solving skills, decision making skills and creative thinking skills, alongside basic academic knowledge (Abad, 2006). There are different ways to accumulate knowledge through learning, commonly through face-to-face classes, which is considered as traditional learning. Formal Education was first introduced by the Europeans during the 1800s and was fully cultivated in the 1900s. Those with Spanish blood were the only ones who were capable and were allowed to study so as to enter universities.

COVID-19 pandemic has struck the entire world with the life-threatening menace it poses to mankind causing everyone's life and even in the education sector to drastically change replacing the normal scenario with the so-called "New Normal" setting. With this on-going setting, in which digitization enforces ways of working and learning, education has been forced further into technologization, a development already well underway, fueled by commercialism and the reigning market ideology. Many authors have examined the significance of using instructional media in teaching/learning process. Wambura (2017) noted that computer has many benefits in education, for example: enhancing academic works, improving lesson and students understanding and influencing independent learning. Teaching and learning resources are important in education because they motivate and encourage learners to utilize more than one sense, hence, increasing their attention and retention capacity. In addition, teaching and learning resources create motivation in learning (Monda, 2012).

Academic performance is mainly related to assessment and it's about meeting short-term and long-term goals in education. Good academic performance of students depends on how well they have mastered the content taught and mastery of content will be aided by use of instructional media in the right way. When various learning resources are used in learning institutions like secondary schools, they arouse



students' interest towards learning and definitely might have positive effects on performance. That is why Neo (2007) emphasized on the need for adequate supply of learning materials in schools. Supply of quality textbooks for example in schools can be of immense importance towards the academic development or performance of the students. Significance of Instructional Media for effective teaching and learning has been hailed by many authors.

That teachers' failure to use a variety of media in the teaching and learning process resulted into failure in grasping subject content. The use of instructional media makes the learning process more effective because it builds greater understanding, reinforcement and retention of the subject matter. Instructional media have knowledge in an impressive way making learning more effective as they help learners in greater acquisition of knowledge. Wambura (2017) observed that computer has many benefits in education including enhancing academic works, improving lesson and students understanding and influencing independent learning. As cited by Wamalwa (2016) that teaching and learning resources are important in education because they motivate and encourage learners to utilize more than one sense hence increasing their attention and retention capacity. The self-instructional materials are those which are described to be self-contained and the manner of presentation is such that the learning activities can be undertaken individually or in small groups. These materials are most effectively used in individualized instruction programs. Separate learning is the new "traditional" self-learning course. Instructors' mail learning assets or understudies may get them online. Understudies too got to total the learning assignments based on the plans allotted. Whereas students and instructors can utilize the internet as a medium to get and yield assignments, they don't connect by means of online addresses or online gatherings to examine the learning materials. A flexible and new way of process requires adaptable and resilient students, parents, and administrators. Learning while regulating the new normal is an important activity juggled by these prominent roles. In the educational context, to sustain and provide quality education despite lockdown and community quarantine, the new normal should be taken into consideration in the planning and implementation of the "new normal educational policy".

Thus, the study assesses the effectiveness of the basic electrical wiring systems online teaching which consider each of the constituent parts of an electrical wiring system, as well as proper handling techniques, and installation and storage procedures for different electrical wiring components. Based on the analysis, enrichment activities will be proposed to develop essential foundational skills required by electrical students.

Methodology Research Design

This study employed quasi-experimental method of research using Pre-test and Post-test design. A quasi-experiment is an empirical intervention study used to estimate the causal impact of an intervention on target population without random assignment. Experimental design is concerned with cause-and-effect relationships in which all experimental studies involve manipulation of the independent variable or the causes and the measurement of the dependent variables also known as the effects. It is determining the effect of a single variable as well as its difference.

Respondents of the Study

The respondents of the study were the 21 First Year Bachelor of Technical-Vocational Teacher Education (BTVTE) students of the Mindoro State University taking the basic electrical wiring system during the Second semester of Academic Year (A.Y) 2021-2022

Research Instrument

The researcher used a self-made test for the Pre-test and Post-test. The Pre-test and Post-test contained the same set of questions. This study utilized a self-made 30-item multiple choice test.



Scaling and Quantification

To quantify the proficiency of the electrical students, the researcher used the following scale.

Equivalent Rating	Description
25-30	Outstanding
19-24	Very Satisfactory
13-18	Satisfactory
7-12	Fair
0-6	Poor

Data Gathering Procedure

To gather all the needed data for the research, a letter duly signed by the Campus Executive Director, Dean of the College of Teacher Education and BTVTED Program Chair. Then, the approved letter of permission to conduct study were presented to the respondents. After introducing the study, the researcher implements the formulated procedures for data collection.

Statistical Treatment of Data

Arithmetic mean was used to measure the mean scores of the pre-test and post-test performance in basic electrical wiring systems online teaching.

Frequency and Percentage were used to determine the percentage of the relative frequency of the students' responses or scores.

t-Test were used to assess whether the means of the result of the pre-test and post-test of the groups of the study are statistically different from each other. This is essential in determining the capacity of online teaching in enhancing the performance of the electrical students

Results

Based on Table 1, the Pre-test results reflected that there are 11 student respondents, First Year Bachelor of Technical-Vocational Teacher Education (BTVTED) students of the Mindoro State University taking the basic electrical wiring system before shifting to online mode achieved a "Fair" performance, and 9 of them gained a "Satisfactory" status. On the other hand, at least one of them out of 20 individuals obtained a "Poor" performance. The overall mean for the Pre-test of the study was 11.71 treated as "Poor" performance.

Table 1. Pre-test Performance of the Respondents in Basic Electrical Wiring Systems through Online Teaching

Score	Frequency	Percentage	Verbal Description
25-30	0	0	Outstanding
19-24	0	0	Very Satisfactory
13-18	9	42.86	Satisfactory
7-12	11	52.38	Fair
0-6	1	4.76	Poor
Mean: 11.71			Poor



Meanwhile on Table 2, the Post-test results showed that there are 18 student respondents that become “Outstanding”, 2 students achieved “Very Satisfactory” and only one of them falls to “Fair” performance during the utilization of online teaching. The overall mean for the Post-test of the study was 27.52 treated as “Outstanding” performance.

Table 2. Post-test Performance of the Respondents in Basic Electrical Wiring Systems through Online Teaching

Score	Frequency	Percentage	Verbal Description
25-30	18	85.71	Outstanding
19-24	2	9.52	Very Satisfactory
13-18	0	0	Satisfactory
7-12	1	4.76	Fair
0-6	0	0	Poor
Mean: 27.52			Outstanding

There is a significant difference between the Pre-test and Post-test scores of the respondents Using Online Teaching for Basic Electrical Wiring Systems considering the computed t-value of 21.49 exceeded the critical value of 2.09 with 20 degrees of freedom at 5% level of significance.

Table 3. t-test Result on the Difference Between the Pre-test and Post-test Scores of Respondents Using Online Teaching for Basic Electrical Wiring Systems

Variables	Mean	SD	df	Computed t-value	Critical t-value $\alpha = 0.05$	Result
Pre-test	11.71	3.32	20	21.49	2.09	Significant
Post-test	27.52	4.27				

Discussion

Pre-test Analysis on the Performance of the Respondents in Basic Electrical Wiring Systems before Online Teaching

The transition to online learning has reshaped the landscape of education, particularly in fields that require hands-on experience, such as Technical-Vocational Teacher Education (BTVTED). The Pre-test results from the study highlight a concerning trend among First Year BTVTED students enrolled in basic electrical wiring systems. With an overall mean score of 11.71 categorized as “Poor” performance, it is crucial to address the implications of these findings and advocate for enhanced educational support during this transition.

The data indicates that 11 respondents achieved a “Fair” performance, while 9 students were rated as “Satisfactory.” However, it is alarming that at least one out of the 20 students demonstrated a “Poor” performance. This raises questions about the effectiveness of online learning in conveying complex technical skills that are traditionally taught in a hands-on environment. The disparity in performance levels suggests that students may struggle to grasp essential concepts without the direct guidance and physical interaction that in-person instruction provides.



Moreover, the shift to online education has introduced barriers that disproportionately affect students pursuing technical-vocational courses. These students often require immediate feedback and practical demonstrations to fully understand the intricacies of electrical wiring systems. Online platforms may not adequately simulate the learning experience necessary for mastering such skills. Therefore, it is imperative to implement strategies that cater to the unique needs of BTVTED students in an online setting.

To improve student outcomes, educational institutions must invest in resources that enhance online learning for technical-vocational programs. This could include providing access to virtual labs, interactive simulations, and comprehensive video tutorials that can replicate the hands-on experience. Additionally, establishing a mentorship system where students can connect with instructors for real-time support can significantly bolster their learning experiences. Furthermore, incorporating blended learning approaches, which combine online instruction with in-person sessions, can bridge the gap between theoretical knowledge and practical application. This hybrid model allows students to benefit from the flexibility of online learning while still receiving the critical hands-on training necessary for their field (Valderama, 2012).

The Pre-test results serve as a wake-up call for educators and administrators within Technical-Vocational Teacher Education. The current performance levels indicate that students require more robust support systems during this transition to online learning. By prioritizing the development of effective online resources and implementing blended learning strategies, educational institutions can enhance the learning experience for BTVTED students, ultimately leading to better performance and skill acquisition in the field of electrical wiring systems. It is vital to recognize that the future of technical education depends on our ability to adapt and innovate in response to the challenges posed by online learning (Adefuye, 2006).

Post-test Analysis on the Performance of the Respondents in Basic Electrical Wiring Systems during the Online Teaching

In recent years, online teaching has emerged as a prominent educational method, especially in response to global events that necessitated changes in traditional learning environments. Despite its challenges, the utilization of online teaching has shown remarkable benefits, particularly in student performance. A recent study highlights these benefits, with notable results from post-test evaluations of students engaged in online learning. The data indicates that 18 out of the respondents achieved an "Outstanding" rating, 2 garnered "Very Satisfactory," and only one student was rated as "Fair." The overall mean score of 27.52 categorizes the majority of students as performing at an outstanding level, suggesting that online teaching is not only viable but also effective for fostering academic success.

Advocates of online teaching argue that it offers flexibility and accessibility that traditional classroom settings may not provide. Students can engage with materials at their own pace, enabling them to revisit concepts until they achieve mastery. This self-directed learning approach fosters a sense of responsibility and independence among students, equipping them with essential skills for future academic and professional pursuits. Moreover, the integration of various digital tools enhances the learning experience, allowing for interactive and engaging methodologies that can cater to diverse learning styles.

Critics of online teaching often point to the potential for decreased motivation and engagement among students. However, the results from the aforementioned study challenge this notion. The high number of students achieving outstanding performance illustrates that, when properly implemented, online education can motivate learners to excel. The dynamic nature of online platforms can stimulate interest and facilitate collaboration through discussion forums, group projects, and multimedia resources, which can enhance the overall educational experience (Rule, 2008).

Furthermore, the ongoing development of technology and online resources continues to improve the quality of online education. As instructors adapt to these tools and modify their teaching strategies, the



effectiveness of online learning will only increase. This adaptability suggests that educators are capable of meeting the needs of their students, regardless of the learning environment.

Analysis on the t-test Result regarding the Difference Between the Pre-test and Post-test Scores of Respondents Using Online Teaching for Basic Electrical Wiring Systems

The significant difference observed between the Pre-test and Post-test scores of respondents using online teaching for Basic Electrical Wiring Systems highlights the effectiveness of this educational approach. With a computed t-value of 21.49, which far exceeds the critical value of 2.09 at a 5% level of significance and 20 degrees of freedom, the data clearly indicates that students' understanding and skills improved substantially after engaging with online instructional methods. This result not only underscores the potential of online education to facilitate learning in technical subjects but also suggests that it can be a viable alternative to traditional classroom settings. As such, educators and institutions should consider integrating online teaching methodologies into their curriculum to enhance student learning outcomes in technical fields like electrical wiring.

Conclusion

The evidence presented in the study underscores the effectiveness of online teaching in promoting student achievement. With a significant number of students performing at an outstanding level, it is clear that online education can serve as a powerful alternative to traditional learning methods. As we move forward, it is essential for educators and institutions to embrace this mode of instruction, recognizing its potential to enhance learning experiences and outcomes. The success observed in this study is not an isolated incident; rather, it reflects a broader trend towards the effectiveness of online teaching and its role in shaping the future of education.

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