

Virtual Communication Competencies for Effective Virtual Pedagogy in Basic Electricity

Onwusuru, I. M.^{1*}, Agbo, N. M.¹

¹ Department of Technology and Vocational Education, Faculty of Education
Nnamdi Azikiwe University, NIGERIA

*Corresponding Author: im.onwusuru@unizik.edu.ng
DOI: <https://doi.org/10.30880/ojtp.2024.09.01.010>

Article Info

Received: 13 August 2024
Accepted: 12 March 2024
Available online: 31 March 2024

Keywords

Effective virtual communication competencies, basic electricity trade, teachers, virtual pedagogy, skill upgrade

Abstract

This study was carried out to investigate virtual communication competencies required for effective online pedagogy in Basic Electricity. Basic Electricity teachers in Anambra State are expected to possess competencies that would enable them to understand the category of students in their virtual class, choose the right channel best suitable to communicate to the class, and seek out for the most suitable feedback channel within a defined time frame. Hence the need to identify the specific areas in virtual communication that Basic Electricity teachers need skills upgrade to enhance their effectiveness in implementation of virtual pedagogy. The study adopted descriptive survey research design. The study was guided by a research question and one hypothesis. A five-point scale structured questionnaire was used in data collections. This was validated by three experts and the reliability established using Cronbach Alpha Reliability technique which yielded reliability coefficient of 0.86. The research question was answered using mean while statistical t-test was used to establish the significance or otherwise of the hypothesis. The findings of the study revealed that ability to speak fluently online using voice compliant platforms, ability to lead discussion online, ability to make learning interactive online, ability to make video calls, among others are the competencies upgrade needs of the teachers. Location was not found to be a determinant factor in the skills upgrade need. Thus, self-development, in-house training, reflective practices, peer review, education, and training related courses as well as standardization meeting for the Basic Electricity teacher was recommended.

1. Introduction

Technological development, advancement, and innovation have necessitated consistent update in the manner of doing things in different sectors. In the educational sector, technological advancement continued to introduce changes in pedagogical methods. Teachers keep adjusting, engaging in deliberate activities to facilitate the learning of the intended worthwhile knowledge, skills, and values to get the necessary feedback from contemporary students (Onwusa, 2020), who are technologically compliant. This act termed pedagogy is an objectively based systematic and interactive activity, primarily involving classroom talk that takes place between a person with higher knowledge and one with lower knowledge (Edmud, 2019). It involves the use of a wide body of knowledge about the subject being taught, and another set of knowledge about the most effective ways to teach that subject to different kinds of learners. It follows that teachers in different fields of education, particularly Basic

Electricity, undertake a complex set of tasks every minute to impart worthwhile knowledge skills, and attitudes to the learners.

As outlined by The National Business and Technical Examination Board (NABTEB) syllabus, Basic Electricity is a trade-subject area in Electrical/Electronic technology which is one of the professional areas in Technical Education. Technical Education is a post-secondary vocational training program whose major purpose is the training of craftsmen and technicians at the sub-professional level (Federal Republic of Nigeria, 2013). Basic electricity as a trade-subject area deals primarily with electricity and magnetism, forces of nature and material for the benefit of mankind. It is the fundamental subject of study in the field of electricity and electronics that is taught in technical colleges (Ogbuanya, Attahiru, Tough & Obe, 2017). It is designed to provide the trainees with the basic knowledge and practical skills in electrical/electronics (Eze, Onwusuru, & Ginigeme, 2021).

Towards effective acquisition of the needful knowledge and skills in Basic Electricity, the teachers in this field are specially trained to qualify for imparting worthwhile knowledge and skills in this educational field and are addressed as technical teachers. According to Phillip (2014), technical teachers are trained technically oriented personnel who are to be the initiators, facilitators, and implementers of planned curriculum for the technological development of a nation. To maintain effectiveness and relevance, technical teachers teaching Basic Electricity are expected to move in pace with the change of the era especially in the use of technology in pedagogical activities. Traditionally, pedagogy was exclusively implemented via face-to-face interaction, but today, several changes and technologies have been introduced and blended into pedagogy as proceeds of technological advancement and precedence of occurring global events. The emergence of COVID-19 (in 2020 in Nigeria) initiated a lot of changes in the pedagogical structure. This was necessitated by the catastrophic scenario experienced in the educational system, particularly in learning Basic Electricity.

Sit-at-home and physical distancing was prolonged to over six months, leading to total shutdown of almost all the schools in the world, thus cutting students off from learning. Adefuye et al., (2021) noted that students complained that this non-engagement in learning for over six months generated in them, learning, psychological, and emotional crises that led to their mental breakdown, including the development of acute depression syndrome. Allowing the occurrence of such an effect in subsequent occasions may leave very traumatic and catastrophic evidence in the welfare of the present generation, thus affecting both the immediate communities and the nation at large. There is therefore an urgent need for teachers, particularly those of Basic Electricity, to embrace virtual pedagogy as one of the major methods in the educational system which will necessitate bridging the gap.

Virtual pedagogy is one of the teaching and learning approaches used in imparting knowledge using computers and the internet facilities. Virtual pedagogy is a distance teaching and learning activities conducted in a virtual learning environment with electronic study contents designed for self-paced (asynchronous) or live web-conferencing (synchronous) online teaching and tutoring (Veronica, 2009). According to Frutos and Owen (2000), a virtual learning environment is characterized by computers, the use of the internet, the interaction between users, the exchange of views, and user access to various useful materials. In virtual learning, users could be in the same learning environment but do not experience any physical contact (Cheuk, 2021). This phenomenon reduces or eliminates the need for teachers to share classrooms with the students in times of viral diseases or needs of such likes.

Effective communication is paramount in every teaching and learning program. The advent of virtual pedagogy is accompanied by certain communication requirements. To achieve effective implementation of virtual pedagogy in Basic Electricity, teachers must possess certain competencies required for effective virtual communication with their students. Unfortunately, one of the major general challenges with the use of virtual technologies in teaching and learning is the inadequate competencies of the teachers (Abid et al., 2022) in effectively communicating with the students using the technologies. Basic Electricity teachers in Anambra State practically closed every academic activity during the COVID-19 pandemic. This may be due to a lack of competencies and perhaps facilities to alternatively migrate to virtual learning which was adopted by some developed countries. Guiding against such a scenario in the future requires improvement in the teachers' competence for the implementation of virtual pedagogy.

Effective virtual communication is a paramount competence for efficient virtual pedagogy. Communication is simply the act of transferring information from one place, person, or group to another. Communication enables the exchange of information or expression of thoughts and feelings (Richa, 2017). Effective virtual communication is therefore the process of transmitting values and subject matter to the learner through a digital medium. Effective virtual communication involves understanding the audience, choice of appropriate digital channels and feedback within a time frame. Basic Electricity teachers in Anambra state need to develop such competencies for effective virtual interaction with their students for efficient virtual pedagogy.

1.1 Statement of the Problem

The catastrophic scenario experienced during the COVID-19 era in non-engagement of students in the learning of Basic Electricity for over six months in Anambra state generated the students, learning, psychological and emotional crises, which led to their mental breakdown, including the development of acute depression syndrome. This was caused by non-readiness of the teachers to promptly migrate to virtual learning which was a measure adopted by some developed countries. Allowing the occurrence of such an effect in subsequent occasions may leave very traumatic and catastrophic evidence in the welfare of the present generation, thus affecting both the immediate communities and the nation at large. A futuristic guide against such a scenario requires that by now, Basic Electricity teachers should have fully adopted and adapted to virtual pedagogy as a proactive measure, knowing that it is the only alternative.

There is a paramount need for effective studying of basic electricity as this lays foundational walls for electrical works which is immense in human activities and in national as well as global development. In addition to catastrophic scenario adaptation, the declining academic performance of Basic Electricity students in Anambra State as reported by the latest NABTEB Chief Examiner's report (2018) has evidenced strong concern for study in Basic Electricity. Glaser and Bruostain (2017) traced down the cause of students poor academic performance to teaching method used. Currently, the method of teaching in technical colleges in Nigerian is mainly teacher-centered and content-driven; hence, sometimes do not provide teachers with the opportunity to effectively explain related theories in Basic Electricity.

Implementation of virtual pedagogy, with its accrued technological features for teaching and learning could fill the methodological gap in learning of Basic Electricity. However, it is unfortunate to note that up till now, the implementation of virtual learning in Basic Electricity subject is still a farfetched fact in Anambra state. Facilities such as computers and others have been provided to schools by the state government; yet, the practice of virtual pedagogy has not been felt. This may be due to a lack of competencies by the teachers to alternatively migrate to this teaching and learning method. There is therefore a need for improvement in the teachers' competence in implementation of virtual pedagogy.

Basic Electricity teachers in Anambra State are expected to possess competencies that would enable them to understand the category of students in their virtual class, choose the right channel best suitable to communicate to the class and seek out the most suitable feedback channel within a defined time frame. Knowing that one is incompetent in executing an activity is one thing while being able to identify the specific areas of improvement needs is another. Basic Electricity teachers in Anambra State may be aware of their incompetency in virtual pedagogy implementation in terms of effective virtual communication with their students but may not know their specific areas of improvement needs for enhancing their virtual communication ability. This study, therefore, is aimed at identifying the specific areas of virtual communication competence enhancement needs for effective implementation of virtual pedagogy by Basic Electricity teachers in Anambra state.

2. Methods

The design of this study is a descriptive survey research design. A survey research design describes ways of assessing public opinion using qualitative or quantitative instruments to elicit responses regarding existing phenomena with the interest of justifying the current condition or practice or planning for improvement. A questionnaire was used to collect quantitative data directly from the teachers on the virtual communication competencies required for effective pedagogy in Basic Electricity; hence the design is deemed appropriate for the study. The study was conducted in Anambra State. Twelve functional technical colleges are offering Basic Electricity in Anambra state and the population of the study is 50 which comprise all the personnel involved in the teaching of Basic Electricity in all the technical colleges. The questionnaire used for the data collection was a five-point scale structured and ranged as follows; Highly Needed (HN, 4.21 – 5.00). Needed (N, 3.41 – 4.20), Undecided (U, 2.61 – 3.40), Not Needed (NN, 1.80 – 2.60), Highly Not Needed (HND, 1.00 – 1.80). Both face and content validity was conducted on the instruments by three experts in Technology and Vocational Education. The reliability of the instrument was established using the Cronbach Alpha Reliability technique which yielded a reliability coefficient of 0.86. This was considered a high reliability. Statistical Package for Social Science (SPSS) was employed for the data analysis. Mean was used to answer the research question while standard deviation was used to determine the closeness of the responses of the respondents. When the deviation is less, it means that data points are close to the mean value, and data is considered reliable. In contrast, if the deviation is wide, data points are spread farther from the mean value, and such data is considered less reliable. T-test was used to test the hypothesis at a 0.05 level of significance, with the decision rule of rejecting the hypothesis if the P value is less than the stated 0.05 level of significance, otherwise, the hypothesis will not be rejected.

3. Results and Discussion

Table 1 shows that the cluster, effective virtual communication competencies required for virtual pedagogy has a mean score of 4.19. This indicates that the respondents generally agreed that the raised items are the effective virtual communication competencies required for virtual pedagogy. The cluster standard deviation of 0.86 shows that the responses of the respondents are closely spread around the mean and this indicates a high level of reliability of the instrument. This aligns with the view of some researchers (Bestman & Iniy, 2022; Malhotra & Majchrzak, 2015) that computer-mediated communication systems are those that use computers to structure and process information and use telecommunications networks to facilitate its exchange. They further pointed out that competencies such as e-mailing, voice messaging, computer (video) conferencing, use of the internet, telephony, broadcast media, and all kinds of audio and video transmission technologies are key to achieving effective virtual communication.

Basic Electricity teachers agreed that all raised items are the effective virtual communication competence required for virtual pedagogy in Basic Electricity. These competencies include; Ability to speak fluently online using voice-compliant platforms, Ability to lead discussion online, Ability to make learning interactive online, Ability to make video calls, Ability to create virtual learning community (delivering lessons at the same time), Ability to use video screen casting, Ability to use blogs and read materials online, Ability to use webinar tools, Ability to touse facebook chat, aim chat, Skype chat and others, among others.

Table 1 Mean and standard deviation of effective virtual communication competencies required for virtual pedagogy

Item Statements	Mean	Std. Deviation	Remark
Ability to explain basic electricity concepts fluently online using voice-compliant platforms.	4.72	0.58	HN
Ability to lead discussion in Basic Electricity lesson online.	4.24	0.77	HN
Ability to make interactive demonstration of practical classes online using demonstration-compliant platforms,	4.36	0.78	HN
Ability to make video calls for Basic Electricity lessons	4.30	0.97	HN
Ability to create a virtual learning community for Basic Electricity students (delivering lessons at the same time using apps)	4.30	0.89	HN
Ability to use video screen casting for practical classes.	4.20	0.86	N
Ability to use blogs and read Basic Electricity related materials online	4.08	1.00	N
Ability to use webinar tools in teaching Basic Electricity concepts	4.06	0.93	N
Ability to touse facebook chat, aim chat, Skype chat, and others.	4.16	0.93	N
Ability to use an avatar for Basic Electricity classes	3.92	0.87	N
Ability to use an online notice board to display information for the students	4.08	0.97	N
Ability to upload and download practical instructions video link	4.32	0.79	HN
Ability to type fast in answering your audience's or student's questions	4.38	0.78	HN
Ability to use a webcam for pedagogical purpose	4.28	0.86	HN
Ability to use video conferencing for teaching Basic Electricity concepts	4.44	0.93	HN
Ability to use email and newsletter	4.12	0.94	N
Cluster Value	4.19	0.86	

The findings of the study show that Basic Electricity teachers need effective virtual communication competencies for efficient implementation of virtual pedagogy in teaching Basic Electricity. These competencies include; Ability to speak fluently online using voice-compliant platforms, Ability to lead discussion online, Ability to make learning interactive online, Ability to make video calls, Ability to create virtual learning community (delivering lessons at the same time), Ability to use video screen casting, Ability to use blogs and read materials online, Ability to use webinar tools, Ability to touse facebook chat, aim chat, Skype chat and others, among others. This finding supported the work view of Iglesias-Pradas et al. (2021), that virtual synchronous communication

has risen to prominence in 2020, with higher and further education institutions looking for a digital effective communication alternative to the traditional classroom experience. Iglesias-Pradas et al (2021), also added that how one delivers the learning material and makes virtual class engaging determines the success of the learning. This follows that Basic Electricity teacher may not have implemented virtual pedagogy effectively during the COVID-19 era due to their inability to apply effective virtual communication skills that would enable them to deliver learning materials and make their virtual class engaging to ensure learning success.

Alma et al. (2017) grouped the virtual competencies into six competencies. They are pedagogical, educational interaction, digital, instructional design, professional, ethical, and legal responsibility, and research. They explained each of these six competencies thus; pedagogical competency refers to implementing, developing and evaluating the teaching-learning process in a virtual environment. The competency of educational interaction refers to the ability to develop the process of accompaniment, follow-up, and educational interaction in virtual tutorial classes. Digital indicates the ability to handle technological, communication, and informational tools in the teaching-learning process, as well as in the tool's management of the virtual learning educational platform. The instructional design competency indicates the ability of the teacher to plan and generate pedagogical training and evaluation devices in the design of virtual learning environments. Professional, ethical, and legal responsibility refers to the ability to commit to the institution and its values, as well as to assume a personal commitment as an instructor at work in virtual learning environments. The research competency indicates the ability to design, execute, and participate in the development and dissemination of relevant research for virtual learning environments. These competencies align with the virtual communication competencies need found in the current study. However, the current study didn't group the competencies.

Abdulrasaq (2020) agrees with the teachers' incompetency by noting that virtual technology-supporting devices such as printers, photocopying machines, desktop computers, laptop computers, Android phones, electronic typewriters, and scanners were available, but were not utilized for virtual learning. This may be probably because of the teachers' incompetency hence the need for teachers to acquire virtual pedagogy effective competencies. Again, the study found that there is no significant difference in the mean responses of Basic Electricity teachers on effective virtual communication competencies needed for virtual pedagogy based on location. To the knowledge of the researchers, there is not yet any finding in agreement or disagreement with this fact, hence, the finding is subject to concurrence or disparity.

4. Conclusion and Recommendation

Basic Electricity teachers in Anambra state need effective communication competencies for the successful implementation of virtual pedagogy. These teachers may be aware of their need for virtual communication competency development but may not know the specific effective areas of focus for the skills development and upgrade. This study identifies the specific areas of effective virtual communication competencies required for the successful implementation of virtual pedagogy in the Basic Electricity trade area. These competencies include; Ability to speak fluently online using voice-compliant platforms, Ability to lead discussion online, Ability to make learning interactive online, Ability to make video calls, Ability to create virtual learning community (delivering lessons at the same time), Ability to use video screen casting, Ability to use blogs and read materials online, Ability to use webinar tools, Ability to touse Facebook chat, aim chat, Skype chat and others, among others. The study also found that there is no significant difference in the mean responses of Basic Electricity teachers on effective virtual communication competencies needed for virtual pedagogy based on location. The study therefore concludes that the development of these identified effective virtual communication competencies would enhance teachers' successful implementation of virtual pedagogy in Basic Electricity subjects in Anambra state. Thus, it is recommended that the National Board for Technical Education (NBTE) and all the concerned stakeholders should organize a professional development program for the Basic Electricity teachers in these identified competencies to enable them to improve their effectiveness and enhance the successful implementation of virtual pedagogy when the paramount need arises. These could be achieved through workshops/seminars/conferences; professional related skill upgrade courses as well as holding skill upgrade standardization meetings. In addition, the teachers should engage in self-development as is a very motivating and effective way for skill upgrade.

Acknowledgement

We would like to thanks those who was contribute directly or indirectly to the publication of this work.

Conflict of Interest

Authors declare that there is no conflict of interests regarding the publication of the paper.

Author Contribution

The authors confirm contribution to the paper as follows: **study conception and design:** Onwusuru, I. M., Agbo, N. M.; **data collection:** Onwusuru, I. M., Agbo, N. M.; **analysis and interpretation of results:** Onwusuru, I. M., Agbo, N. M.; **draft manuscript preparation:** Onwusuru, I. M., Agbo, N. M. All authors reviewed the results and approved the final version of the manuscript.

References

- Abdulrasaq (2020). Availability and utilization of e-learning facilities in the teaching of senior school Physics in Ilorin, Nigeria. *Journal of Education and Learning (EduLearn)* 14 (3).
<https://doi.org/10.11591/edulearn.v14i3.16342>
- Abid H., Mohd J., Mohd A. Q., & Rajiv S. (2022). Understanding the role of digital technologies in education: A review, *Sustainable Operations and Computers*, 3, 275-285.
<https://doi.org/10.1016/j.susoc.2022.05.004>.
- Adefuye A.O., Adeola H.A., Busari J. (2021). The COVID-19 pandemic: The benefits and challenges it presents for medical education in Africa. *Pan African Medical Journal*. 2021;40(September)
doi: 10.11604/pamj.2021.40.42.28489.
- Alma, L.S.A., Domingo, S.O. & Minerva, C. (2017). Teaching Competences in Higher Education Virtual Learning Environments. *International Journal of Strategic Property Management*, 6 (4).
- Bestman, E. A and Iniye, A. (2022). Virtual communication and organizational responsiveness of indigenous oil and gas companies in Rivers State. *International Academic Journal of Management and Marketing*, 7(1).
- Cheuk, F. N. (2021). The physical learning environment of distance learners in higher education - A conceptual model. *Frontiers in Psychology*. <https://doi.org/10.3389/fpsyg.2021.635117>
- Edmund, H. (2019). *Creating significant learning experiences: An integra approach to designing college courses*. Calif: Jossey-Bass San Francisco
- Eze, T.I., Onwusuru, I.M. & Ginigeme, O. (2021). Gender-Relative Effect of Project-Based Learning Method on Academic Achievement and Retention Of Technical College Students in Basic Electricity. *Journal of Vocational Education Studies*, 4, <https://doi-10.12928/joves.v4i1.3379>
- Federal Republic of Nigeria. (2013). *National Policy on Education*. Lagos: NERDC Press.
- Frutos, B. M & Owen, M. (2000). Implementing Virtual Learning Environments: Looking for Holistic Approach. *Educational Technology & Society*, 3(3).
- Glaser, C. & Bruostain, J.C (2017). Improving fourth grade students' composition skills: effects of strategy instruction and self regulation procedures. *Journal of Education Psychology*, 99(2), 297-310.
- Iglesias-Pradas S, Hernández-García Á, Chaparro-Peláez J, Prieto J.L. (2021). Emergency remote teaching and students' academic performance in higher education during the COVID-19 pandemic: A case study. *Computers in Human Behaviour*. <https://doi.org/10.1016/j.chb.2021.106713>
- Malhotra, A. & Majchrzak, A. (2015). Virtual workspace technologies: Enabling virtual teams. *Sloan Management Review*, 46 (2), 11-14.
- Ogbuanya, T.C., Attahiru, A., Tiough, M. D., & Obe, O. M. (2017). Influence of psychosocial environment on students' achievement in Basic Electricity in government technical colleges in Niger state, Nigeria. *Global Journal of Pure and Applied Mathematics*, 13 (8), 4199-4221.
- Onwusa, C. (2020). Effect of Information and Communication Technology on Students' Cognitive Achievement and Interest in Metalwork Technology in Technical Colleges OSR. *Journal of Research & Method in Education, (IOSR-JRM)*, 7 (10).

- Phillip B. (2014). *26 Words that can change your life: Nurture your mind, heart and soul to transform your life and relationships*. Book B.pp.76-ISBN978-0-9939006-0-0
- Richa, S. (2017). Communication: The Lifeline. *World Wide Journal of Multidisciplinary Research and Development*, 3 (9): 259-262
- Veronica, S.P. (2009). Reasons to Use Virtual Reality in Education and Training Courses and a Model to Determine When to Use Virtual Reality. *Themes in Science and Technology Education Special Issue*, 59-70 Klidarithmos Computer Books.