E-ISSN : 2828-0903
P-ISSN : 2827-9077
IJESS INDONESIAN JOURNAL OF EDUCATION AND SOCIAL STUDIES
Indonesian Journal of Education and Social Studies (IJESS)
Vol. 04, No. 01 (2025), p. 57-69
Available online at https://ejournal.unuja.ac.id/index.php/IJESS

Learners' Perceptions of Using YouTube Videos in Enhancing Their Communication Skills

Maphanga Nhlakanipho, Maeko Mogale Simon Albert*, Nkwanyane Themba, Ramaboea Hendrick, Praygod Nkosi, Kola Malose Isaac
University of Limpopo, South Africa

*Corresponding Author: mogale.maeko@ul.ac.za
http://doi.org/10.33650/ijess.v4i1.11031
Received: January 2025, Revised: March 2025, Accepted: April 2025

Abstract:
Integrating YouTube videos in teaching and learning has transformed teaching pedagogies by offering educators a powerful tool for enhancing learning experiences. This study focused on using YouTube videos to enhance the teaching and learning of communication skills when executing their mini-Practical Assessment Tasks. In addition, the study intended to have a better grasp of how learners perceive the employment of YouTube videos to support them in improving their communication skills. This study adopted qualitative research as a research approach to gather non-numerical data. Hence, a case study was used in the research design to explore the effectiveness of using YouTube videos to enhance grade 9 Technology learners' communication skills during the execution of mini-Practical Assessment Tasks. Observations and semi-structured interviews were used to gather data. Inductive analysis was used to analyse the data obtained from the semi-structured interviews while thematic content analysis was used to analyze the data gathered through observations. The researchers identified YouTube videos as effective in enhancing learners' communication skills. The study also found that some learners were not focusing during the presentation, which could be influenced by the fact that learners in rural areas still prefer the traditional way of teaching.
Key Words: *Communication skills, YouTube videos, Design process, Mini-PAT, Technology*

Please cite this article in APA style as:
Maphanga, N., Maeko, M. S. A., Nkwanyane, T., Ramaboea, H., Nkosi, P., & Kola, M. I. (2025). Learners' Perceptions of Using YouTube Videos in Enhancing Their Communication Skills. *Indonesian Journal of Education and Social Studies, 4*(1), 57–69.

INTRODUCTION

Technology is a hands-on subject that equips learners with Design Process skills through mini-Practical Assessment Tasks (PAT) (Maphalala & Adigun, 2021; Wannapiroon & Pimdee, 2022). A mini-PAT is a task that addresses certain components of the Design Process or a complete ability task that comprises all steps such as Investigation, Design, Make, Evaluate, and Communication (IDMEC) of the design process (Castro & Tumibay, 2021; Ozkan & Umdu Topsakal, 2021). As such, to successfully complete a mini-PAT, an application of all the steps of the Design Process needs to be incorporated (Bizami et al., 2023; Hursen, 2021). According to the Curriculum and Assessment Policy Statement (CAPS), the Design Process forms the backbone of the technology subject and

should be used to structure the delivery of the subject (Lin et al., 2021; Oguguo et al., 2021), which advocates for learners to be exposed to a problem, need, or opportunity as a starting point.

Learners in grade 9 struggle with employing the Design Process stages to effectively complete a mini-PAT. The teaching and learning of Design Process is still a challenge for teachers and learners and they tend to rush to work on the mini-PAT without paying attention to what it is and what it entails (Asad et al., 2021; Hasin & Nasir, 2021; Sayaf et al., 2021). The learners have difficulty with the communication stage of the Design Process. The communication stage is considered to be a crucial component of the entire Design Process as it equips learners with effective communication skills.

The Design Process is considered to be a more advanced cognitive activity in Technology education; consequently, the teacher must understand the Design Process to aid learners when engaging in tasks within the Design Process, which includes IDMEC (Lufri et al., 2021; Mtshali & Pillay, 2023; Sergeeva et al., 2023). During the communication stage, learners in their groups showcase the ideas and models they have been developing (Patricia et al., 2023). In addition, the policy stipulates artistic methods like perspective, texture rendering, shading, coloring, and shadows; artistic impressions are made throughout the communication stage to market the product to potential customers (Blose & Ndlovu, 2023; Ramaboea et al., 2023). For these skills to be facilitated successfully, they require Technology teachers to have a thorough understanding of the mini-PAT teaching strategies to practice in the classroom.

Less research has been done on enhancing learners' Design Process skills using effective Information Communication Technology (ICT) techniques, such as YouTube videos. Previous studies undertaken outlined the Strengthening of Teaching the Mini-PAT (Alenezi, 2023; Alenezi et al., 2023). Technology Teachers' Ability to Facilitate Mini-PATs through 9E Instructional Model (Al Rawashdeh et al., 2021; Kim et al., 2022). Technology Teacher's Enhanced creativity with Mini-PAT (Mutohhari et al., 2021). A philosophical framework for enhancing the understanding of artefacts in the technology classroom (Tahmina, 2023). An exploration of creative thinking skills technology classroom, and Teaching the design process in a technology class (Lin et al., 2021; Sayaf et al., 2021). However, there are limited studies focusing on effective ICT strategies to enhance the skills etched in the design process.

This gap led to this study exploring the use of YouTube videos to enhance learners' communication skills when carrying out the mini-PAT. To address this challenge, this study explored the use of YouTube videos as an effective tool to improve Grade 9 Technology learners' communication skills when completing their mini-PAT. Using YouTube videos as supporting material in lessons will help learners understand and remember what they have been taught or exposed to in class (Harida, 2023; Purwanti et al., 2022). The use of YouTube videos has the potential to provide learners with an opportunity to physically see what was

being taught, which can assist them to understand how to navigate a mini-PAT. The successful implementation of the mini-PAT would lead to higher learner performance with hands-on practical work (Bakla & Mehdiyev, 2022; Fyfield, 2022). Furthermore, it would markedly enhance learner performance during the mini-PAT, showing that Technology as a subject can indeed prevail.

This research offers originality by situating YouTube within the specific pedagogical practice of the communication phase of the Design Process, an area often overshadowed by emphasis on creativity and product-making. Unlike prior studies that centered on teacher facilitation or overall technology performance, this study foregrounds learners' perspectives, thereby prioritizing their lived experiences as co-constructors of knowledge. The argument is that YouTube videos, when systematically integrated, can scaffold learners' capacity to communicate technical ideas more clearly and creatively, fostering both conceptual understanding and collaborative learning. Grounded in constructivist theory, the study contends that knowledge is best built through interaction with authentic resources that mirror real-world practices. By framing YouTube as both an educational tool and a cultural artifact familiar to learners, the research argues for its potential to bridge the gap between informal learning environments and formal classroom demands.

RESEARCH METHOD

This study adopted a constructivist's paradigm that is based on observation and scientific study on how people learn. A constructivist theory acknowledges different views of reality, as people learn differently (Hirose & Creswell, 2023). In a constructivist theory, knowledge is subjective and co-constructed. In addition, humans obtain knowledge from the construction of something based on their life experiences. Thus, a constructivist approach is in fact one of the best philosophical approaches that assists in understanding the complexities and multiplicity of phenomena, especially in this 21st century where creative ideas and inventions are pursued through research and education.

Constructivism is inclined to be more dependent on qualitative data collection and analysis approaches when it comes to knowledge. Therefore, to enhance communication skills among learners during mini-PAT execution, this study employed qualitative methods to understand learners' knowledge and views when YouTube videos are used to help them understand the various steps in the Design Process (IDMEC). To generate data, purposive sampling was used to sample 30 grade 9 learners from the 3 schools in the Manthole Circuit in the Limpopo Province. It should be noted that the Manthole Circuit comprises of 10 Senior Secondary schools offering technology as a subject; however, a purposive sampling technique assisted in selecting the 3 schools, which are in close proximity to the researchers (Stanley, 2023).

The 3 schools comprise of 80 learners in total; the study selected 30

learners, where 10 learners from each of the three schools were selected based on their academic achievements. These learners were top achievers in the Technology subject and were seen as participants who could add value to the study. Data was collected through interviews and observations. Semi-structured interviews were used to gain a better understanding of learners' perspectives concerning the effectiveness of YouTube videos in improving their communication skills during mini-PAT activities. Because the sample size was 30 learners, focus group interviews was used to group them into 10 learners per group, translating to 3 groups named G1-G3. Pseudonyms L1-L30 were used to conceal learner identities. The observations data assisted the study to gain a comprehensive understanding of the real-life context in which YouTube videos were used to enhance learners' communication skills during mini-PAT implementation. As a result, the participants were shown YouTube videos on how to successfully communicate their mini-PAT, which provided them with a chance to think creatively and critically to enhance their communication abilities (Matta, 2022).

The study used inductive analysis to analyze the data obtained during semi-structured interviews, and thematic content analysis was used to analyze data from observations. Thematic content analysis of data involves discovering recurring themes, patterns, or concepts, followed by describing and explaining those categories (Williams, 2021). In addition, thematic analysis takes coding frequencies into account while developing themes. The researchers observed the lessons and answered the observation schedule. Field notes were used, analyzed, and coded into themes in line with the constructivism framework.

RESULT AND DISCUSSION

Result

The use of YouTube Videos Enhances Technology Learners' Communication Skills.

In responding to the above question, observation was used as one of the data collection approaches. The researchers observed three sessions, one per school, where the participants were presented with two YouTube videos on how to communicate and present a mini-PAT. The researchers gathered and recorded information in the following ways:

- The researchers prepared ICT tools (laptop, overhead projector, and speaker) and made seating arrangements, then invited the participants to watch two YouTube videos. Throughout the session, the researchers sat in the back of the classroom, recording the presentation and taking notes.
- The researchers observed the learners as they watched YouTube videos during their mini-PAT presentation, which is part of the communication stage. An observation tool was used to collect data.

Observation for G1 (A Narration)

G1 was able to share their progress using a flowchart. In addition, they outlined their chosen design and marked the process on the flowchart. G1 was able to present and share their basket solution in terms of sketches, working drawings, and artistic impressions. G1 was able to explain their two initial ideas when presenting and identified the chosen for the proposed solution. They further explained the roles they played during the design and making of the proposed basket solution. Meaning and understanding on how to communicate a mini-PAT when watching YouTube videos was shown. The group was paying full attention to the videos that were played. Moreover, the skills embedded in the communication phase did reflect during the presentation. G1 was able to show creative communication skills using a flowchart, sketches, and drawings to show the process of design and the making of the actual basket model. Furthermore, the model was also presented. Group members were collaborating and interacting before and during the communication or presentation of their basket solution.

Observation for G2 (A Narration)

G2 did not use a flowchart to present their progress. Nevertheless, G2 was able to present their basket solution using sketches and working drawings. G2 did not present any artistic impressions but was able to present their proposed ideas and the design selected. Moreover, the roles played in the designing and making of the basket solution were outlined. However, G2 presented little meaning and understanding on how to communicate a mini-PAT when watching YouTube videos. The group did not pay attention to the videos played. The skills embedded in the communication phase were partially reflected during the presentation. Moreover, the basket prototype was not creatively communicated; only sketches and drawings were communicated. However, a flowchart was not used, and the actual model was not presented. Group members interacted and collaborated before and during communication about their basket solution.

Observation for G3 (A Narration)

G3 was able to share their progress using a flowchart. G3 creatively created the flowchart using colors, sharing a design, and detailing the making process. G3 was able to present and share their basket solution using sketches and artistic impressions. Bright colors were used to infuse the artistic impression. G3 was able to present and explain their ideas and the chosen design for the proposed basket solution. Furthermore, the role each group member played from the beginning to the completion of the product were also outlined. The group showed meaning and understanding of how to communicate a mini-PAT as they were watching YouTube videos. This was also shown during the presentation as the skills embedded in the communication phase did reflect. The group creatively communicated their basket solution using a flowchart, drawings, and pictures to illustrate the design and making of the basket. The group also imaginatively presented the actual model. Group members were interacting and collaborating before communicating and presenting their basket solution.

Conceptual Understanding

Conceptual understanding is the knowledge of concepts in an integrated and ordered form, as well as knowing additional ideas throughout the novice-expert spectrum. Conceptual understanding is important in learning the concept of the Design Process. The implementation of YouTube videos enhanced learners conceptual understanding of how to effectively communicate their mini-PAT. Stating that different teaching modes, such as the use of videos, are used to equip learners with the necessary skills. As such, G1 and G3 showed a conceptual understanding of the Design Process, particularly how to effectively communicate their mini-PAT. Konicek-Moran and Keeley (2015) support this by stating that the primary purpose of education is to develop conceptual knowledge. Groups G1 and G3 showed an understanding of the skills embedded in the communication phase during the presentation.

In addition, when watching YouTube videos, G1 and G3 were paying attention to the videos and seemed to make meaning of the content being taught on the videos. Using YouTube videos as supporting material in your lessons will help learners understand and remember what they have been taught or exposed to during lessons. However, during the presentation, G2 showed minimal comprehension and understanding of the communication phase. This clearly indicates that there is a lack of conceptual understanding from G2. Moreover, during the lesson, G2 did not pay attention to the YouTube videos presented. The cause of this could be that some learners are more used to the traditional way of teaching than the modern teaching pedagogies. Therefore, integrating ICTs into the classroom could facilitate this transition and enhance the teaching and learning process.

Interaction and Collaboration

Technology encourages learners to be creative and critical thinkers by encouraging them to be inventive. Furthermore, it facilitates collaborative learning and fosters interaction (DBE, 2011). To some extent, collaboration and interaction were facilitated. Participants in respective groups were collaborating and interacting with one another before and during the presentation. Moreover, the use of YouTube videos enabled all group members to exchange ideas in coming up with the structure of the presentation for their mini-PAT. Kubheka (2018) corroborates this, asserting that a mini-PAT fosters collaborative learning and teamwork.

The Learners' Perceptions and Videos Assist

In this study, the researchers formulated five questions based on the theoretical framework to address the research question above. The researchers conducted 1 interview with each respective group. The researchers performed the interviews personally to clarify any questions that could emanate from the process. This helped to ensure that participants understand each question before answering. The findings were organized in such a manner that the question was

posed first, then the interpretation of the question, and lastly the participants' replies with interpretation to their responses**.**

This question was posed to determine whether learners were able to draw conclusions about how to use flowcharts to communicate their progress during a task after watching YouTube videos. Communication as the final stage in the design process, providing evidence of the preceding stages. The learner should record all stages of the design in their portfolio file. Moreover, CAPS states that during the Design Process, communication requires learners to provide a record of the processes from the beginning of the problem to the realization of the solution. Communication can be done orally, in writing, graphically, or electronically. The following are excerpts from the participants:

L1*: "Yes, the YouTube videos helped us because we wrote the steps on how we started the making of the basket. We made a frame using wires, then we knitted plastics and thereafter we join the plastics together on the frame".*

L5*: "No, we do not have flowchart".*

L3*: "Yes, the YouTube videos assisted us on how to structure and do a flowchart".*

The participants L1 and L3 responded that they were able to share their progress in terms of simple flowcharts after watching YouTube videos. It is evident that YouTube videos assisted the learners to communicate and record their progress using simple flowcharts. As stated by CAPS (2011), learners need to provide a record of the process from the beginning of the problem to the realization of the solution, which can be done orally, in writing, graphically, or electronically. However, only L5 did not share their progress using simple flowcharts. Even after watching YouTube videos, it is likely that the learners still do not understand how to share their progress using flowcharts.

Second question was posed to gain insights on whether students were able to communicate their products using sketches, working drawings, and artistic impressions after watching YouTube videos. Learners should present their solution in the form of sketches, artistic impressions of the solution, working drawings, and their model. Participants' responses are presented below:

L4*: "Yes, we did two sketches. The first one had plastic bottle caps and the second only incorporated knitted plastics bags. We decided to choose the second sketch and work with it".*

L6*: "Yes Sir, we have working drawings that we used to make the basket".*

L7*: "Yes they did because we did have Sketch 1 and 2. We chose the first one because it was easier, and plastics bags are easy to find compared to the one with bottle caps".*

It is evident that YouTube videos enabled or assisted learners to successfully present and communicate their mini-PAT model in the form of sketches and working drawings. The participants indicated that the videos helped them to present their product using sketches and working drawings. These findings indicate that YouTube videos were successful in enhancing learners' communication skills.

The third question was presented to respondents and aimed to determine whether YouTube videos assisted learners in explaining their ideas and the role they played in the design and making of the product. According to CAPS (2011), during the communication phase, explaining ideas and the role played is one of the skills learners are required to attain.

The participants indicated the role they played during the design and making of the product. In addition, the participants' replies matched what the researcher demanded, proving that the YouTube videos enabled learners to explain their ideas and the role they played. An assumption can be made that the participants understood how to communicate about a product.

Last question aimed to determine whether the learners were able to construct meaning and comprehend the key idea that was centered around communicating a mini-PAT. Secondly, the study aimed to determine if the YouTube videos can assist learners with challenges that result from their inexperience of the technology Design Process. Below are some of the replies received from the participants:

L2: *"Yes Sir, we now fully understand how to communicate a mini-PAT. The videos helped us."*

L9: *"Not sure Sir."*

L8: *"Yes, we now understand the steps in communicating a mini-PAT. For examples, we can now do flowcharts and put in pictures before presenting".*

The replies from L17 and L19 to this question showed how YouTube videos enabled them to construct meaning and understanding when communicating a product during the mini-PAT. However, L19 confirms the researcher's observation that they did not construct much meaning and understanding from the YouTube videos. An assumption can be made that L21 are not familiar with the use of ICT tools in the classroom and that they prefer traditional ways of lesson delivery, as at first they could not focus and follow the lesson presentation.

Discussion

The results provide clear evidence that YouTube videos can enhance learners' communication skills in the technology classroom. Groups that paid closer attention to the videos, such as G1 and G3, demonstrated stronger conceptual understanding and creative presentation, while G2 showed weaker outcomes. This suggests that the effectiveness of video-based learning is closely tied to learner engagement (Maisuroh & Aisyah, 2024; Michaelsen et al., 2023). These findings confirm the potential of video integration as a supportive pedagogical tool for communication within the Design Process.

The findings align strongly with constructivist learning theory, which emphasizes knowledge construction through interaction and experience. Learners who actively engaged with the videos constructed meaning by translating visual input into flowcharts, sketches, and artistic impressions. This

supports Piaget's notion of learning as active construction and Vygotsky's emphasis on collaborative meaning-making (Tiba, 2023). The success of G1 and G3 illustrates how learners build on prior knowledge to develop new skills when guided by multimedia resources.

The findings resonate with previous studies. Nungu et al. (2023) showed YouTube's role in enhancing comprehension and retention in language learning, while, Rukavina et al., (2021) reported its effectiveness in improving procedural learning in nursing education. The importance of structured mini-PAT teaching (Patricia et al., 2023). This study extends those insights by focusing specifically on the communication phase of the Design Process, demonstrating that video-based learning can support not only knowledge acquisition but also the articulation of ideas through visual and oral communication.

The contrast between G1/G3 and G2 highlights that not all learners benefit equally. G2's limited attention to the videos and weaker communication outcomes suggest that learner readiness and attitudes toward ICT play a critical role. This finding echoes (Bogomolova et al., 2021; Faiz et al., 2023), who noted that many learners in rural contexts are more familiar with traditional teaching methods, making ICT integration initially challenging. Addressing these barriers requires strategies that scaffold learners' transition from traditional to digital pedagogies.

The study demonstrates that YouTube videos foster communication not only in technical terms (flowcharts, sketches, working drawings) but also in collaboration and role articulation. Learners articulated individual contributions and collaborated effectively in presenting their products. This indicates that communication skills in technology education extend beyond product representation to include teamwork, leadership, and negotiation—skills that are vital for preparing learners for real-world technological problem-solving.

While the overall findings are positive, challenges remain. Some learners, particularly in G2, struggled with focus and conceptual understanding. This may reflect digital divides, limited exposure to ICT, or lack of prior training in video-based learning. Teachers' role in curating appropriate videos, providing structured guidance, and scaffolding communication activities becomes crucial. Without such support, learners may fail to fully utilize the affordances of YouTube as a pedagogical tool.

This study contributes both theoretical and practical insights. Theoretically, it demonstrates that constructivist pedagogy can be enriched through video integration, especially in enhancing communication during mini-PAT execution. Practically, it highlights the need for teacher training in ICT-based instruction, structured classroom implementation of video content, and contextual adaptation for rural schools. Policy-makers and curriculum developers should consider embedding digital video resources in technology education to bridge gaps in communication skills. Future research should explore comparative studies across urban and rural contexts, and employ mixed

methods with pre- and post-intervention measures to validate the observed impacts.

CONCLUSION

The goal of the research was to explore the effectiveness of the use of YouTube videos to enhance Grade 9 Technology learners' communication skills. Furthermore, this study is intended to gain a better grasp of how learners perceive the use of YouTube videos to support them in improving their communication skills. The findings of this study were consistent with the original research problem; hence, the objective was achieved. YouTube videos were found to be effective in enhancing learners' communication skills. However, some learners were not focusing during the presentation, which could be influenced by the fact that learners in rural areas are not used to ICT tools in the classroom; they prefer the traditional ways of teaching.

ACKNOWLEDGMENT

We want to thank all parties who have supported this research, especially the participants, fellow researchers, the district and schools involved. Their support was invaluable in completing this research.

REFERENCES

Al Rawashdeh, A. Z., Al Arab, A. R., Alara, M., & Al-Rawashdeh, B. (2021). Advantages and Disadvantages of Using E-Learning in University Education: Analyzing students' perspectives. *Electronic Journal of E-Learning*, *19*(3), 107–117. https://doi.org/10.34190/ejel.19.3.2168

Alenezi, M. (2023). Digital Learning and Digital Institution in Higher Education. *Education Sciences*, *13*(1), 88. https://doi.org/10.3390/educsci13010088

Alenezi, M., Wardat, S., & Akour, M. (2023). The Need of Integrating Digital Education in Higher Education: Challenges and Opportunities. *Sustainability*, *15*(6), 4782. https://doi.org/10.3390/su15064782

Asad, M. M., Hussain, N., Wadho, M., Khand, Z. H., & Churi, P. P. (2021). Integration of E-Learning Technologies for Interactive Teaching and Learning Process: An Empirical Study on Higher Education Institutes of Pakistan. *Journal of Applied Research in Higher Education*, *13*(3), 649–663. https://doi.org/10.1108/JARHE-04-2020-0103

Bakla, A., & Mehdiyev, E. (2022). A Qualitative Study of Teacher-Created Interactive Videos Versus YouTube Videos in Flipped Learning. *E-Learning and Digital Media*, *19*(5), 495–514. https://doi.org/10.1177/20427530221107789

Bizami, N. A., Tasir, Z., & Kew, S. N. (2023). Innovative Pedagogical Principles and Technological Tools Capabilities for Immersive Blended Learning: A Systematic Literature Review. *Education and Information Technologies, 28*(2), 1373–1425. https://doi.org/10.1007/s10639-022-11243-w

Blose, P., & Ndlovu, E. C. (2023). An Investigation on Factors Affecting the Teaching of Practical Assessment Tasks in the Senior Phase Technology Classrooms. *Research in Social Sciences and Technology, 8*(4), 345–359. https://doi.org/10.46303/ressat.2023.46

Bogomolova, K., Sam, A. H., Misky, A. T., Gupte, C. M., Strutton, P. H., Hurkxkens, T. J., & Hierck, B. P. (2021). Development of a Virtual Three-Dimensional Assessment Scenario for Anatomical Education. *Anatomical Sciences Education, 14*(3), 385–393. https://doi.org/10.1002/ase.2055

Castro, M. D. B., & Tumibay, G. M. (2021). A Literature Review: Efficacy of Online Learning Courses for Higher Education Institution Using Meta-Analysis. *Education and Information Technologies, 26*(2), 1367–1385. https://doi.org/10.1007/s10639-019-10027-z

Faiz, H., Al-Amin, M. F., & Mundiri, A. (2023). Transforming Organizational Quality Through Effective Administrative Training. *Communautaire: Journal of Community Service, 2*(2), 157–167. https://doi.org/10.61987/communautaire.v2i2.352

Fyfield, M. (2022). YouTube in the Secondary Classroom: How Teachers Use Instructional Videos in Mainstream Classrooms. *Technology, Pedagogy and Education, 31*(2), 185–197. https://doi.org/10.1080/1475939X.2021.1980429

Harida, R. (2023). YouTube to Promote Critical Thinking in Critical Listening Course. *Journal of English Language Learning, 7*(1), 363–373. https://doi.org/10.31949/jell.v7i1.5941

Hasin, I., & Nasir, M. K. M. (2021). The Effectiveness of the Use of Information and Communication Technology (ICT) in Rural Secondary Schools in Malaysia. *Journal of Education and E-Learning Research, 8*(1), 59–64. https://doi.org/10.20448/journal.509.2021.81.59.64

Hirose, M., & Creswell, J. W. (2023). Applying Core Quality Criteria of Mixed Methods Research to an Empirical Study. *Journal of Mixed Methods Research, 17*(1), 12–28. https://doi.org/10.1177/15586898221086346

Hursen, C. (2021). The Effect of Problem-Based Learning Method Supported by Web 2.0 Tools on Academic Achievement and Critical Thinking Skills in Teacher Education. *Technology, Knowledge and Learning, 26*(3), 515–533. https://doi.org/10.1007/s10758-020-09458-2

Kim, J., Lee, H., & Cho, Y. H. (2022). Learning Design to Support Student-AI Collaboration: Perspectives of Leading Teachers for AI in Education. *Education and Information Technologies, 27*(5), 6069–6104. https://doi.org/10.1007/s10639-021-10831-6

Lin, K.-Y., Wu, Y.-T., & Williams, P. J. (2021). Effects of Infusing the Engineering Design Process into STEM Project-Based Learning to Develop Preservice Technology Teachers' Engineering Design Thinking. *International Journal of STEM Education, 8*(1), 1. https://doi.org/10.1186/s40594-020-00258-9

Lufri, L., Elmanazifa, S., & Anhar, A. (2021). The Effect of Problem-Based Learning Model in Information Technology Intervention on Communication Skills. *Ta'dib, 24*(1), 46–52. https://doi.org/10.31958/jt.v24i1.2456

Maisuroh, S., & Aisyah, N. (2024). Connecting Tradition With Innovation: The Impact of WordWall on Learning Outcomes in Fiqh Studies. *Fondatia, 8*(3), 715–728. https://doi.org/10.36088/fondatia.v8i3.5294

Maphalala, M. C., & Adigun, O. T. (2021). Academics' Experience of Implementing E-Learning in a South African Higher Education Institution. *International Journal of Higher Education, 10*(1), 1–13. https://doi.org/10.5430/ijhe.v10n1p1

Matta, C. (2022). Philosophical Paradigms in Qualitative Research Methods Education: What Is Their Pedagogical Role? *Scandinavian Journal of Educational Research, 66*(6), 1049–1062. https://doi.org/10.1080/00313831.2021.1958372

Michaelsen, L. K., Knight, A. B., & Fink, L. D. (2023). Team-Based Learning: A Transformative Use of Small Groups in College Teaching. In *Team-Based Learning: A Transformative Use of Small Groups in College Teaching*. Taylor & Francis. https://doi.org/10.4324/9781003447535

Mtshali, T. I., & Pillay, A. S. (2023). Pedagogical Capital Strategies for Civil Technology Skills-Based Activities. *International Journal of Learning, Teaching and Educational Research, 22*(5), 389–409. https://doi.org/10.26803/ijlter.22.5.20

Mutohhari, F., Sutiman, S., Nurtanto, M., Kholifah, N., & Samsudin, A. (2021). Difficulties in Implementing 21st Century Skills Competence in Vocational Education Learning. *International Journal of Evaluation and Research in Education, 10*(4), 1229–1236. https://doi.org/10.11591/ijere.v10i4.22028

Nungu, L., Mukama, E., & Nsabayezu, E. (2023). Online Collaborative Learning and Cognitive Presence in Mathematics and Science Education: Case Study of University of Rwanda, College of Education. *Education and Information Technologies, 28*(9), 10865–10884. https://doi.org/10.1007/s10639-023-11607-w

Oguguo, B. C. E., Nannim, F. A., Agah, J. J., Ugwuanyi, C. S., Ene, C. U., & Nzeadibe, A. C. (2021). Effect of Learning Management System on Student's Performance in Educational Measurement and Evaluation. *Education and Information Technologies, 26*(2), 1471–1483. https://doi.org/10.1007/s10639-020-10318-w

Ozkan, G., & Umdu Topsakal, U. (2021). Exploring the Effectiveness of STEAM Design Processes on Middle School Students' Creativity. *International Journal of Technology and Design Education, 31*(1), 95–116. https://doi.org/10.1007/s10798-019-09547-z

Patricia, M. M., Isaac, M. T., & Manto, R. S. (2023). Enhanced Creativity With Mini-PAT: A Case of Grade 9 Technology Teachers in Sekhukhune East. *African Perspectives of Research in Teaching and Learning, 7*(1), 110–121.

Purwanti, N. K. R., Suwastini, N. K. A., Adnyani, N. L. P. S., & Kultsum, U. (2022). YouTube Videos for Improving Speaking Skills: The Benefits and Challenges According to Recent Research in EFL Context. *Jurnal Pendidikan Teknologi dan Kejuruan, 19*(1), 66–75. https://doi.org/10.23887/jptk-undiksha.v19i1.41108

Ramaboea, H. K., Ramaligela, M. S., & Mtshali, T. I. (2023). Teaching Mechanical Systems Practical Assessment Task Through 9E Instructional Model in a Technology Senior Phase Classroom. *African Perspectives of Research in Teaching and Learning, 7*(3), 537–547.

Rukavina, T. V., Viskić, J., Poplašen, L. M., Relić, D., Marelić, M., Jokic, D., & Sedak, K. (2021). Dangers and Benefits of Social Media on E-Professionalism of Health Care Professionals: Scoping Review. *Journal of Medical Internet Research, 23*(11), e25770. https://doi.org/10.2196/25770

Sayaf, A. M., Alamri, M. M., Alqahtani, M. A., & Al-Rahmi, W. M. (2021). Information and Communications Technology Used in Higher Education: An Empirical Study on Digital Learning as Sustainability. *Sustainability, 13*(13), 7074. https://doi.org/10.3390/su13137074

Sergeeva, O. V., Zheltukhina, M. R., Bikbulatova, G. I., Sokolova, E. G., Digtyar, O. Y., Prokopyev, A. I., & Sizova, Z. M. (2023). Examination of the Relationship Between Information and Communication Technology Competencies and Communication Skills. *Contemporary Educational Technology, 15*(4), ep483. https://doi.org/10.30935/cedtech/13819

Stanley, M. (2023). Qualitative Descriptive: A Very Good Place to Start. In *Qualitative Research Methodologies for Occupational Science and Occupational Therapy: Second Edition* (pp. 52–67). Routledge. https://doi.org/10.4324/9781003456216-4

Tahmina, T. (2023). Students' Perception of the Use of YouTube in English Language Learning. *Journal of Languages and Language Teaching, 11*(1), 151–159. https://doi.org/10.33394/jollt.v11i1.6883

Tiba, C. (2023). Motivation to Explicitly Teach Reading Comprehension Strategies After a Workshop. *Reading and Writing (South Africa, 14*(1), 1–8. https://doi.org/10.4102/rw.v14i1.405

Wannapiroon, N., & Pimdee, P. (2022). Thai Undergraduate Science, Technology, Engineering, Arts, and Math (STEAM) Creative Thinking and Innovation Skill Development: A Conceptual Model Using a Digital Virtual Classroom Learning Environment. *Education and Information Technologies, 27*(4), 5689–5716. https://doi.org/10.1007/s10639-021-10849-w

Williams, H. (2021). The Meaning of "Phenomenology": Qualitative and Philosophical Phenomenological Research Methods. *Qualitative Report, 26*(2), 366–385. https://doi.org/10.46743/2160-3715/2021.4587