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A Review on Modern Teaching Methods at Secondary Level in Khyber Pakhtunkhwa

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Abstract

Modern education methods are an important component of educational reform, transforming the classroom from the teaching-centered model to the teaching model centered on students, activity and interaction. For secondary levels, particularly in Khyber Pakhtunkhwa, there is a need of teaching methods which foster conceptual understanding, critical thinking, creativity, communication, collaboration and problem-solving skills in students. This paper is a review of the concept and effectiveness of modern teaching approaches at secondary school. The study is restricted to modern teaching technique in secondary level in Khyber Pakhtunkhwa. The study is of a qualitative research design with literature review approach. The review results show that modern teaching methods (brainstorming, problem solving, inquiry teaching, cooperative learning, computer-assisted teaching, and technology-assisted teaching) can enhance students' learning engagement, motivation, knowledge, achievement, and practice. Their effectiveness relies on teacher training, availability of resources, classroom environment, students' readiness and support from the institution, however.

Keywords: Modern Teaching Methods, Secondary Level, Khyber Pakhtunkhwa, Learner-Centered Teaching, Activity-Based Learning, Qualitative Review.

Introduction

Modern Teaching Methods: Background and Basic Level

Modern methods are those of the type which seek to engage the students totally in the teaching-learning process and are learner-centered, activity based, and creative. Modern teaching method emphasizes student's active learning, creativity, questioning, cooperative learning and hands-on learning rather than the traditional teaching method in which the teacher is the main source of information and the students are passive listeners. These approaches are similar to the constructivist approach since learners are building their knowledge and skill in the classroom by their own activities, interaction and guided learning. In the approach, the teacher's role is not just as a lecturer, but as a facilitator and guide to help students reach learning objectives by having meaningful lessons in the class (Hiep, 2000). Today's teaching techniques also minimize unhealthy rivalry between pupils and foster their cooperation, involvement, and positive school atmosphere (Alexandrova et al., 2020).

Modern teaching methods are particularly crucial at the secondary level, as students are developing the ability to think conceptually, to communicate with confidence and to solve problems, as well as to prepare for further study. The traditional chalk and talk approach can give the basic information but it will be inadequate to develop the creativity, analytical power and the ability to practically use the knowledge. In contrast, modern pedagogies emphasize questioning, demonstration, explanation, activity, co-operation and student-centered learning. These strategies enable students to have a deeper understanding of concepts and to make learning more meaningful, interesting and useful in real-life situations (Balliu, 2017).

The modern teaching methods have gained importance in the context of science, technology and changes in society. In today's world students must be ready for a technology based world that will require them to be innovative, creative, and critical thinkers. Thus, the teaching and learning of secondary school students should not only be memorization of facts, but also analysis of information, ask questions, solve problems and apply information practically. The application of computers, laptops, Wi-Fi, LCD projector, interactive whiteboard, multimedia resources and other learning

technologies has given new opportunities in the field of teaching. Using technology in the teaching process enables a learner to be self-reliant and gives chances to the learners to explore knowledge outside textbooks (Zofan, 2007; Shabani, 2003).

Brainstorming, problem-solving, inquiry-based teaching, computer-based teaching, collaborative learning, discussion, demonstration, project-based learning and technology-integrated instruction are some of the modern teaching methods that are used. Brainstorming is a participatory technique where participants freely share ideas and opinions to address a problem or discuss a topic. It promotes creative thinking and enables students to develop self-confidence in expressing their opinions (Aghazadeh, 2009). Problem solving is also an important technique that enables students to find strategies to get to a solution. Here, the path taken to get to the answer is as important as the answer itself, as students learn how to think, analyze and apply to what has already been learned (Parsons et al., 2006; Safavi, 2003). The Inquiry Based Learning (IBC) method is a teaching method designed to build students' capacities to ask questions, explore problems, organize information and make explanations. It promotes intellectual discipline and independent learning (Ghorchian, 1993). Computer-based teaching offers the students digital learning experiences and enables them to benefit from pre-designed educational programs, multimedia and interactive learning tools (Shabani, 2003).

Students' learning, understanding, motivation, engagement, academic progress and personality development can be used to weigh the effectiveness of modern teaching methods. Students are actively encouraged to involve in group work, discussions, case studies, projects, practical exercise and simulations in a modern way of teaching. Active involvement contributes to the students' deep learning, retention and critical thinking (Ullah & Iqbal, 2020). These approaches also relate theory to real life and help students appreciate the relevance and usefulness of their learning. By engaging in collaborative learning, pupils can share ideas, learn from each other and improve their communication and teamwork skills. The use of technology can offer the possibility of accessing multimedia resources, immediate feedback, online learning materials and interactive learning experiences, which can enhance understanding and motivation (Borzenko et al., 2024; Kamran et al., 2023).

Statement of the Problem

As time goes on, learners need new learning strategies that can not only impart knowledge but also give them experience, creativity, critical thinking, communication and problem solving. Traditional teaching methods, including lecture, memorization, reading from textbooks and examination teaching are still used extensively in a large number of secondary schools. Such techniques can be useful for students to use in exams but are not sufficient to equip them for the demands of a contemporary society. The present age thus demands modern teaching to suit the requirements of the present age particularly in Science, Technology and social development. In Khyber Pakhtunkhwa at secondary level, students require new teaching strategies which will enhance their skills from the initial stages and ensure they can utilize knowledge in practical situations. Hence, the present review is mainly concerned with the understanding of what is meant and how effective the modern methods of teaching are at the secondary level in K-P-Khyber Pakhtunkhwa Province.

Significance of the Study

The present study is important as it has highlighted the significance of modern teaching techniques at the secondary level of education in particular in Khyber Pakhtunkhwa Province. The teaching methods are modern, which are learner centered and activity based, so that students are active in the teaching learning process. These techniques are applicable in enhancing students' understanding, motivation, creativity, confidence, communication and problem-solving skills. The study is also significant to the teachers as it explains the application and effectiveness of modern method in classroom teaching. The activities, discussions, investigations, brainstorming, problem solving and technology assisted learning will make students a part of the lesson and practically apply what they learned. The study may also be useful for the school heads, curriculum planners, teacher trainers and education policy makers as they would see that it is imperative to bring about a change in rote memorization and emphasize on teaching of the students in a practical way with emphasis on skills. Besides, the study gives a platform to future researchers to conduct their study on modern teaching approach in secondary schools of KP.

Research Paradigm

The study is based on the interpretivist paradigm. This paradigm is appropriate because the study aimed to understand the meaning and effectiveness of modern teaching methods, in reviewing and interpreting the existing literature. The modern teaching methods are related to classroom interaction, student participation, teachers' facilitation, and learning activities, so that qualitative and interpretive can be employed to understand them. The study also adopts a constructivist approach to learning where teaching and learning activities give opportunities for the learners to construct their knowledge by doing, talking, learning from questions, working together, and solving problems respectively (Hiep, 2000; Akbari, 2010).

Research Design

The research design of the study is qualitative. It is a study based on literature review which examines the existing literature on the modern teaching methods. The study is not quantitative, but rather descriptive in nature, explaining the concept, nature and effectiveness of the modern methods of teaching at the secondary level. This qualitative review design is suitable in helping the researcher to describe and explain the way modern teaching methods contribute to the learning, understanding, motivation, engagement and skill development of students.

Review of the Related Literature

Concept of Modern Teaching Methods

The modern teaching method is based on the principle of students in the process of learning, the student is actively engaged in learning. In the traditional teaching, student is mainly dependent on the teacher and textbook, and in the modern teaching, the students are trained to have their own participation, questioning, discussion, investigation, and application of knowledge. The teaching style in school is thus learner-centered, activity-based, and constructivist. They emphasize speaker's interests, abilities, and needs of the learners and get teachers to prepare students to listen, speak, read, write, argue, compare, analyze, construct and create (Akbari, 2010; Hiep, 2000).

The secondary level is important for modern teaching methods as students should be helped to transcend from memorisation. They require approaches that enhance conceptual understanding, creativity, confidence, communication and preparation for further study and real life. This is achieved using modern teaching methods, in which students are actively engaged with the subject matter in a classroom environment. Active learning activities like group project, case study, simulation, discussion, and practical activity enable students to apply knowledge and to understand the concepts better (Ullah & Iqbal, 2020; Riley & Ward, 2017).

The concept of Learner-Centered Approach in modern teaching.

One of the primary principles for modern teaching is learner-centered teaching. On this way, the student is regarded the main body of the teaching and learning process. The teacher not only informs, but leads, supports and helps students to build knowledge. Through this way, learners can become responsible learners and participate in classroom activities (Hiep, 2000; Alexandrova et al., 2020).

Learner-centred teaching is extremely helpful at the secondary level, since they are at a stage where they need confidence, being independent and are active. Students grow in understanding and learning habits when they discuss and question, when they do activities, and when they do activities in groups. This approach also allows teachers to respond to the varied abilities, interests and learning styles of students (Akbari, 2010; Stronge, 2018).

Activity-Based Learning

Activity-based learning is one of the crucial things of modern teaching. It is a method that involves students in activities rather than just listening to teachers. These activities can involve experiments, group tasks, presentations, role play, worksheets, classroom games, projects and practical demonstrations. Activity-based learning facilitates students to learn by doing, making the knowledge more meaningful and lasting (Riley & Ward, 2017; Ullah & Iqbal, 2020).

Activity-based learning is useful in the secondary level because students will learn better if they are involved in doing an activity. For instance, in science, students can learn scientific concepts through experiments, in social studies, students can learn social issues by role play, discussion, and in language, they can learn how to communicate through speaking and writing. This technique catches the students' attention and makes the educational environment more interesting and less boring for students (Javed, 2023; Kamran et al., 2023).

Brainstorming is a contemporary teaching method.Brainstorming is a modern teaching method.

Brainstorming is one of the helpful modern teaching methods. It enables students to express their ideas without risk of criticism. This approach fosters creativity, confidence and involvement. Brainstorming can be used in secondary classes prior to beginning a new topic, as part of the discussion on a social issue, or as a way to solve a classroom problem. It assists students to reflect on their prior learning and to develop new ideas (Wilson, 2013; Al-Samarraie & Hurmuzan, 2018).

Diversity of opinion stimulates creative thinking, and a more diverse number of ideas may generate better quality ideas (Aghazadeh, 2009). Brainstorming is also used to help students develop communication skills as they freely share their thoughts. It builds an atmosphere in the classroom that allows all students to voice their ideas and opinions (Aghazadeh, 2009; Tsai et al., 2020).

Problem-Solving Method

Another way of teaching that is very important in today's time is problem solving. It helps students to grasp a problem, remember previous learning, brainstorm potential solutions, and make a decision. This technique can be used in secondary school as it enables logical thinking, decision making and confidence (Güleç, 2020; Jonassen, 2010).

According to Parsons et al. (2006), problem-solving is more effective in group format, but Safavi (2003) notes that important components of problem-solving are the students' experiences and the process of reaching a new solution. Problem solving may be applied in secondary school in mathematics, science, social studies, even in language learning. It raises students' thinking skills, not what they think (Parsons et al., 2006; Safavi, 2003; Drapeau, 2014).

Inquiry-Based Teaching

Inquiry-based teaching is also an effective modern teaching method. It stimulates students to question, look for information, sort information, and build explanations. It can be helpful in fostering independent thought and intellectual rigor. However, in an inquiry based teaching students are not presented with answers ready to use, but they are given the opportunity to explore and build understanding (Kang & Keinonen, 2018; Wale & Bishaw, 2020).

Ghorchian (1993) states that inquiry based teaching allows students to make the transition from problem to exploration and supports students' thinking through questioning and investigation. This is a technique that can be utilized in science experiments, social studies projects, history, and environmental studies at the secondary level. It enables students to be curious, reflective and active learners (Ghorchian, 1993; Bruce-Davis et al., 2017; Sukontawaree et al., 2022).

The integration of computer-based teaching and technology.

The use of computer in teaching is an important phenomenon in modern education. It relies on the use of computers, digital programs, multimedia and technological tools to aid teaching and learning. In the computer-based teaching, the students can have chances to learn from the visual, interactive and self-paced materials. It also helps students to learn the subject matter in an area where it is hard to be taught through lectures only (Shabani, 2003; Ige & Hlalele, 2017).

Shabani (2003) says that computer-based teaching has direct connection between students and computers, and Zofan (2007) says that electronic technology is an important aspect of constructivist teaching. The advantages of using technology is that it gives students instant feedback, access to online resources, multimedia, simulations, and digital libraries. It can facilitate individual learning and enable students to learn at their own speed and pace (Zofan, 2007; Cueva & Inga, 2022).

Technology can be used to enhance the classroom teaching at secondary level provided there is basic technology equipment like computers, internet, projectors and digital resources. In many places where technology is not advanced, teachers can utilize simple technologies like videos, slides, mobile learning and printed digital content for effective learning (Ghory & Ghafory, 2021; Borzenko et al., 2024).

Collaborative Learning

Co-operative learning is also an important contemporary learning approach. This approach is a collaborative process in which students are assigned to pairs or groups to accomplish a task, discuss an issue, solve a problem, or create a project. Collaborative learning helps students exchange ideas, listen to one another, tolerate diverse points of view and foster teamwork (Barkley et al., 2014; Zheng et al., 2015).

Collaborative learning is also very beneficial at the secondary level as it enhances communication and social skills. Pupils teach and learn from one another and are more confident in voicing their opinions. Weak students can also benefit from collaborative learning as they can get support from other students. Establishes a positive, caring classroom atmosphere (Kamran et al., 2023; Stronge, 2018).

Course focuses on the use of modern teaching methods and student motivation

The effectiveness of modern teaching methods is because of the increase of students' motivation and engagement. Substantial engagement during lessons increases student interest in learning. Learning is made more fun and meaningful through activities, real-life scenarios, technology, discussion and group work. Furthermore, the modern teaching methods enable students to acquire the knowledge on a practical basis that feed into their theoretical learning, thereby enhancing their understanding (Oudeyer et al., 2016; Ullah & Iqbal, 2020).

The application-oriented learning enables students to grasp the knowledge value in real-life situations, which enhances their motivation and understanding. Motivation is very important at the secondary level as students tend to lose their interest when teaching is solely based on lecture and memorization. The classroom is more active and attractive with the use of modern teaching methods (Javed, 2023; Kamran et al., 2023).

The current teaching approach is also helpful in teaching students to think critically. Students develop critical thinking abilities when they consider problems, evaluate information, discuss perspectives, and come up with solutions. Inquiry, debate, case studies, problem solving, project work etc., allows students to think deeply (Dumbuya, 2024; Wale & Bishaw, 2020).

Current educational practices can help students develop critical thinking skills by posing them with problems, asking them to evaluate the challenges, analyze them, and propose solutions (Guo and Lee, 2023). Critical thinking is required in the second grade level due to the need for students to comprehend and apply concepts, make judgments, and to solve academic and real-life problems (Guo & Lee, 2023; Jonassen, 2010).

Modern Teaching Methods and Communication Skills

Communication skills are also enhanced by use of modern teaching methods. Students express their ideas and learn from each other through group work, peer learning, classroom discussion, role play, presentations and collaborative projects. The activities foster students' confidence in speaking, listening, explaining, and presenting their thoughts (Barkley et al., 2014; Zheng et al., 2015).

Modern teaching methods equip students for the situations in life where communication and cooperation is required. Communication skills are particularly significant at the secondary level as it is a time when students are preparing for higher education, for interviews, for social participation and for the future world of work (Kamran et al., 2023; Stronge, 2018).

Effectiveness of modern methods of teaching at secondary level

The effectiveness of modern teaching methods can be seen in the following aspects: learning, understanding, motivation, involvement, students' learning progress and personality development. These strategies enable students to actively engage in learning rather than passively listening. They facilitate deeper understanding and learning through discussion, activity, inquiry, problem solving and practice (Ullah & Iqbal, 2020; Riley & Ward, 2017).

The use of modern approaches in teaching also enhances pupils' performance in academic work well as their conceptual understanding. If a student grasps a lesson, it stays in his or her memory longer and can be used in various scenarios. These techniques also build confidence, creativity, collaborative working and self-learning. Hence, secondary level students are very well addressed with the modern approaches of teaching (Kamran et al., 2023; Javed, 2023; Carpenter et al., 2022).

Problems faced in the application of modern teaching methods

While the use of modern teaching methods is effective, there may be some problems in implementing them. Teachers may not be properly trained, technologically competent, have proper materials, have time, or lack institutional support. Other teachers might be reluctant to change due to their comfort with conventional teaching styles based on lectures (Szymkowiak et al., 2021; Spaska et al., 2025).

Additionally, students might struggle with learning in an active manner, in a group, through self-directed learning, and/or technology-based activities. Some secondary schools of Khyber Pakhtunkhwa might face problem of large class size, limited resources, absence of internet, less number of computers, examination pressure etc. which may have an impact on the proper

implementation of modern teaching methods. Hence teacher training, planning, availability of resources, leadership support from teachers, and continuous assessment is required for successful implementation of modern teaching methods (Meylani, 2024; Srinivasa et al., 2022).

Conclusion

The use of modern teaching techniques is crucial for enhancing the quality of teaching and learning in secondary schools of KPK. These approaches are essentially learner-centred, activity-based, interactive, and practical, so that the classroom changes from a passive listening and rote-learning environment to one of active learning, enquiry, creativity, collaboration and meaningful understanding. The review reveals that the use of modern classroom strategies (Brainstorming, Problem Solving, Inquiry-based Teaching, Computer-based Teaching, Collaborative Learning, Discussions, Demonstrations, and Technology Integrated Instruction) can have a positive impact on students' motivation, engagement, confidence, conceptual clarity, critical thinking, communication skills, and academic performance. These techniques also enable students to transfer their knowledge from the classroom to the real world, making the learning more relevant, useful, and lasting to the needs of the modern world.

Pupils in secondary education are at a crucial stage in terms of intellectual and social development; it is important that they encounter teaching methods that are suitable to both examinations and the world of work as well as higher education and future challenges. These opportunities are present in modern teaching methods, which involve students in asking questions, offering ideas, solving problems, collaborating in groups, embracing technology, and building their own understanding with the support and guidance of the teacher. But what works well, relies on some factors such as teachers' professional training, teaching materials availability, application of technology, school leadership support, manageable class size, and the readiness of students to learn actively. So, it has been concluded that modern teaching techniques should be promoted in the secondary schools of KP by teacher training, provision of basic technical facilities, supporting curriculum and classroom practices by minimizing rote-learning and promoting practical, creative and critical learning. When well executed, modern pedagogy can be effective, meaningful and responsive for the students of the twenty-first century in secondary education.

References

Aghazadeh, M. (2009). *Methods and principles of teaching*. Tehran: Aeezh Publications.

Akbari, R. (2010). Modern and active teaching methods and their influence on student learning. *Educational Sciences Review*.

Akour, M., & Alenezi, M. (2022). Higher education future in the era of digital transformation. *Education Sciences, 12*(11), 784.

Al-Samarraie, H., & Hurmuzan, S. (2018). A review of brainstorming techniques in higher education. *Thinking Skills and Creativity, 27*, 78–91.

Alexandrova, E., et al. (2020). Modern approaches to teaching and learning in contemporary education. *Educational Research Studies*.

Awidi, I. T., & Paynter, M. (2019). The impact of a flipped classroom approach on student learning experience. *Computers & Education, 128*, 269–283.

Balliu, V. (2017). Modern teaching methods and the changing role of teachers. *Journal of Educational Development*.

Barkley, E. F., Major, C. H., & Cross, K. P. (2014). *Collaborative learning techniques: A handbook for college faculty*. John Wiley & Sons.

Borzenko, O., Tamozhska, I., Varhata, O., & Shevchuk, V. (2024). Development of modern teaching methods under the influence of information technologies. *Pakistan Journal of Life and Social Sciences, 22*(2), 4269–4279.

Bransford, J. D., & McCarrell, N. S. (2024). A sketch of a cognitive approach to comprehension. In *Cognition and the symbolic processes* (pp. 189–230). Routledge.

Bruce-Davis, M. N., Gilson, C. M., & Matthews, M. S. (2017). Fostering authentic problem seeking: A step toward social justice engagement. *Roeper Review, 39*(4), 250–261.

Campbell, L. O. (2016). Concept mapping: An "Instagram" of students' thinking. *The Social Studies, 107*(2), 74–80.

Carpenter, S. K., Pan, S. C., & Butler, A. C. (2022). The science of effective learning with spacing and retrieval practice. *Nature Reviews Psychology, 1*(9), 496–511.

Cueva, A., & Inga, E. (2022). Information and communication technologies for education considering the flipped learning model. *Education Sciences, 12*(3), 207.

Drapeau, P. (2014). *Sparking student creativity: Practical ways to promote innovative thinking and problem solving*. ASCD.

Dumbuya, E. (2024). Curriculum development for lifelong learning: Role of critical thinking and problem-solving skills. *IUP Journal of Soft Skills, 18*(4), 5–10.

Fink, L. D. (2013). *Creating significant learning experiences: An integrated approach to designing college courses*. John Wiley & Sons.

Ghory, S., & Ghafory, H. (2021). The impact of modern technology in the teaching and learning process. *International Journal of Innovative Research and Scientific Studies, 4*(3), 168–173.

Ghorchian, N. G. (1993). Inquiry-based teaching and intellectual development. *Educational Planning Studies*.

Guo, Y., & Lee, D. (2023). Leveraging ChatGPT for enhancing critical thinking skills. *Journal of Chemical Education, 100*(12), 4876–4883.

Güleç, S. (2020). Problem solving skills in social studies education and problem solving skills of social studies teachers. *Journal of Education and Training Studies, 8*(3), 48.

Hiep, P. H. (2000). Traditional versus modern teaching methods. *Educational Practice Review*.

Ige, O. A., & Hlalele, D. J. (2017). Effects of computer-aided and blended teaching strategies on students' achievement in civic education concepts in mountain learning ecologies. *Education and Information Technologies, 22*(6), 2693–2709.

Javed, M. (2023). The effectiveness of different teaching methods in education: A comprehensive review. *Journal of Social Signs Review, 1*(1), 17–24.

Jonassen, D. H. (2010). *Learning to solve problems: A handbook for designing problem-solving learning environments*. Routledge.

Kamran, F., Kanwal, A., Afzal, A., & Rafiq, S. (2023). Impact of interactive teaching methods on students learning outcomes at university level. *Journal of Positive School Psychology, 7*(7), 89–105.

Kang, J., & Keinonen, T. (2018). The effect of student-centered approaches on students' interest and achievement in science: Relevant topic-based, open and guided inquiry-based, and discussion-based approaches. *Research in Science Education, 48*(4), 865–885.

Maki, P. L. (2023). *Assessing for learning: Building a sustainable commitment across the institution*. Routledge.

Meylani, R. (2024). A comparative analysis of traditional and modern approaches to assessment and evaluation in education. *Batı Anadolu Eğitim Bilimleri Dergisi, 15*(1), 520–555.

Mutch, C. (2005). *Doing educational research: A practitioner's guide to getting started*. NZCER Press.

Oudeyer, P. Y., Gottlieb, J., & Lopes, M. (2016). Intrinsic motivation, curiosity, and learning: Theory and applications in educational technologies. *Progress in Brain Research, 229*, 257–284.

Parsons, R. D., Hinson, S. L., & Brown, D. S. (2006). *Educational psychology: A practitioner-researcher model of teaching*. Thomson.

Riley, J., & Ward, K. (2017). Active learning, cooperative active learning, and passive learning methods in an accounting information systems course. *Issues in Accounting Education, 32*(2), 1–16.

Safavi, A. (2003). *General methods and techniques of teaching*. Tehran: Contemporary Publications.

Shabani, H. (2003). *Educational skills and teaching methods*. Tehran: SAMT Publications.

Spaska, A., Kozub, H., Abylasynova, G., Kozub, V., & Koval, Y. (2025). Evaluation of innovative teaching methods using modern information technologies. *Jurnal Ilmiah Ilmu Terapan Universitas Jambi, 9*(1), 422–440.

Srinivasa, K. G., Kurni, M., & Saritha, K. (2022). *Learning, teaching, and assessment methods for contemporary learners*. Springer.

Stronge, J. H. (2018). *Qualities of effective teachers*. ASCD.

Sukontawaree, N., Poonputta, A., & Prasitnok, O. (2022). Development of problem-solving abilities in science by inquiry-based learning with cooperative learning for Grade 4 students. *Journal of Educational Issues, 8*(2), 771–782.

Szymkowiak, A., Melović, B., Dabić, M., Jeganathan, K., & Kundi, G. S. (2021). Information technology and Gen Z: The role of teachers, the internet, and technology in the education of young people. *Technology in Society, 65*, 101565.

Tsai, M. N., Liao, Y. F., Chang, Y. L., & Chen, H. C. (2020). A brainstorming flipped classroom approach for improving students' learning performance, motivation, teacher-student interaction and creativity in a civics education class. *Thinking Skills and Creativity, 38*, 100747.

Ullah, O., & Iqbal, M. (2020). Comparison of impact of traditional and modern teaching methods on students' performance at elementary school level. *Global Regional Review, 1*, 386–395.

Wale, B. D., & Bishaw, K. S. (2020). Effects of using inquiry-based learning on EFL students' critical thinking skills. *Asian-Pacific Journal of Second and Foreign Language Education, 5*(1), 9.

Wilson, C. (2013). *Brainstorming and beyond: A user-centered design method*. Newnes.

Zheng, B., Niiya, M., & Warschauer, M. (2015). Wikis and collaborative learning in higher education. *Technology, Pedagogy and Education, 24*(3), 357–374.

Zofan, S. (2007). Technology and constructivist teaching methods. *Journal of Educational Technology*.