

Impact of Project-based Learning Approach for Social Studies on the Academic Scores of 6th-Grade Students in one of the Middle Secondary Schools under Trashigang Dzongkhag

Kesang Wangchuk^{1*}, Kinga Tshering²

¹Trashigang Middle Secondary School, Trashigang, Bhutan.

²Education Monitoring Division, Ministry of Education and Skills Development, Bhutan.

*Correspondence: kesangwangchuk@education.gov.bt

Received: 30 April 2023

Accepted: 12 March 2024

DOI: <https://orcid.org/0000-0001-7907-9767>

Abstract

The study explored the effectiveness of the project-based learning approach and students' perceptions of it. The study employed an explanatory sequential mixed-method research approach. The participants consisted of 37 students in 6th grade students in one of the middle secondary schools in eastern Bhutan. The study employed an achievement test as the quantitative data that was analysed using histograms and paired-sample t-tests. The qualitative data were collected using semi-structured interviews from 10 students. To generate themes for the qualitative data, Braun and Clarke's thematic analysis was used in the study. The quantitative result of the study revealed that there were significant improvements in students' scores on achievement tests after intervention using a project-based learning approach. The qualitative results indicated that students' perceptions and views on the project-based learning approach were positive since the majority of the students were engaged on the group level. The project-based learning approach also fosters collaborative skills such as communication and teamwork.

Keywords: *Collaborative learning Project-based learning, Social studies, Student engagement*

Background

Project-based learning approach has a long history in American education, dating back to the progressive era in the early 20th century (Kliebard, 2004). John Dewey popularised a project-based learning approach in his notion of student-centred educational approaches that encouraged real-world relevance and applications, these methods promoted self-initiated learning by giving students more prospects for learning (Dewey, 1902). Furthermore, the project-based learning approach is considered one of the effective strategies for providing 21st-century skills such as the exchange of information, teamwork, planning, management of time, investigation, self-evaluation, and reflection skills (Dorji, 2019).

In Bhutan modern education started with a curriculum borrowed from the neighbouring country India (Department of Curriculum and Professional Development [DCPD], 2022); Dorji, 2019). Students learned concepts mostly by rote memorisation, and teaching and learning were mostly teacher-centred (Lhamo & Chalermnirundorn, 2021). Classroom practices in Bhutan are teacher-centred but apply student-centred methods (Utha, 2016) thus contextualising the teaching and learning process (Royal Education Council [REC], 2018). Further, teachers act as facilitators or encourage collaborative learning. However, Rabgay (2018) asserted that conventional teaching is still carried out where it is dominated by the lecture method consisting of chalk and chalkboard and teachers simply provide information. Moreover, in Bhutanese schools, rote learning and memorisation are widely used (Lhamo & Chalermnirundorn, 2021). Thus, the teaching and learning process in Bhutanese classrooms needs a necessary shift from a teacher-centred to a learner-centred approach.

The project-based learning approach was implemented by the Bhutanese government as part of a larger initiative to modernise the nation's educational system. The conventional rote learning method, which placed a strong emphasis on memorisation and repetition (Dorji, 2022) was acknowledged by the Royal Government of Bhutan as an insufficient method for educating students for the demands of the contemporary world. Further adopting a strategy to achieve excellence is crucial for making the subject content easier to teach (Boadu, 2015). Additionally, the contemporary world and changing scenarios require child-centred teaching and learning (Dorji, 2019). The goal of this study was to replace the long-established traditional technique of teaching social studies with a current but effective instructional strategy, namely a project-based learning approach.

A teaching approach known as a project-based learning approach emphasises the improvement of students' knowledge and abilities after the completion of projects.

The purpose of the project-based learning approach is to provide students with the chance to learn by doing, and by having them work on real-world projects that require them to apply what they have learned in class.

Bhutan's social studies curriculum incorporates history, geography, and economics from grades 4th to 6th grades, branching out into specialised subjects of history and geography from grade 7th, leading to a complete educational foundation. According to Peldon and Chalermnirundorn (2018), in the context of Bhutanese education students who scored 86-100% in history, geography, and economics in the Bhutan Council for School Examination and Assessment were comparatively low, attributable to a lack of proper understanding of social studies concepts in lower grades. Thus, to improve the proper comprehension of social studies in lower grades it is necessary to employ the right and adaptable teaching and learning strategies consequently leading to improvement in academic scores.

Owing to the aforementioned challenges and issues in social studies in the 6th grade in the Bhutanese curriculum, this study examined the effectiveness of a project-based learning approach. Moreover, there are adequate studies that examine the impact of a project-based learning approach on students' academic scores. Nevertheless, no studies have been conducted on the impact of the project-based learning approach in social studies in Bhutan. Consequently, this study endeavoured to bridge the gap and contribute to the pool of knowledge.

Literature Review

The project-based learning approach involves students working on a project for an extended period to solve a challenging problem with a goal in mind (Sheppard, 2022). It uses an inquiry-based and student-centred approach where students are involved in knowledge construction and development of real objects (Brundiers & Wiek, 2013; Krajcik & Shin, 2014). Project-based learning approach combines several academic fields with student-centred activities, and students complete projects with specific objectives (Han et al., 2015). Larmer et al. (2019) pointed out that the project-based learning approach places a strong emphasis on contextualising, coupled with the inquiry-based learning method. Additionally, active student participation, research-based learning methods, and comparative learning are all components of a project-based learning approach (Loyens et al., 2015).

The six characteristics of the project-based learning approach are guiding questions, emphasis on learning objectives, involvement in educational activities,

student cooperation, use of scaling technology, and production of physical objects (Krajcik & Shin, 2014). The solution to the guiding question is provided as a written report summarising the issues and their challenges, the possible solutions based on gathered data (e.g., through calculations or estimations), and the criteria used to choose the best option (Beneroso & Robinson, 2022). It emphasises student-centred activities and problem-oriented learning. Moreover, students achieve skills and knowledge through projects that they carry out in groups (Condliffe et al., 2016). In light of this, a project-based learning approach can be defined as a collaborative inquiry-based teaching strategy where students can also perform project-based learning activities.

Compared to the conventional way of teaching, where the teacher leads instruction, a project-based learning approach significantly improves academic scores (Balemen & Özer Keskin, 2018; Chen & Yang, 2018). It has also been demonstrated to raise students' capacity for critical thinking and questioning (Sasson et al., 2018). A study conducted by Dorji (2019) in Bhutan revealed that the implementation of a project-based learning approach made students excited and curious, furthermore, they were motivated and engaged throughout the learning session. Additionally, the project-based learning approach also aids in building teamwork and collaboration skills, key aspects of the project-based learning approach were thought to be the growth of collaborative abilities and the integration of theory and practice (Viro et al., 2020). Thus, there is sufficient evidence of the numerous benefits of the project-based learning approach.

A project-based learning approach is a pedagogical approach that results in enriching students' learning approach and knowledge, students are engaged beyond the traditional classroom through certain projects (Avila, 2019). The project-based learning approach is distinguished from other instructional strategies by the word project, which is characterized as "an act of creation over time" (Lenz et al., 2015, p. 67). Project-based learning approach contains activities that are concerned with the construction of knowledge since it is based on the principle of constructivism (Oguz-Unver & Arabacioglu, 2014). Since students actively construct knowledge, it leads to better comprehension. Project-based learning approach prioritises learning philosophy stressing students' statements "I need to know" encouraging learning more than teachers' statements "because you should know" (Lenz et al., 2015, p. 68)

Researchers have often emphasised the value of a project-based learning approach as a central element of students' learning (Lim et al., 2023). Moreover, project-based learning is not supplementary to the curriculum (Almulla, 2020; Arantes

do Amaral & Lino dos Santos, 2018; Cintang et al., 2018). It is essential to provide students with questions or issues to drive their minds to facilitate productive learning (Arantes do Amaral & Lino dos Santos, 2018). Driving questions are used by teachers to help students connect the tasks they are assigned with the fundamental information they should be developing (Lim et al., 2023). Moreover, according to Lim et al. (2023), through this constructive investigation, students will be able to build upon their prior knowledge and encounter challenges.

There are a multitude of studies that confirm that project-based learning approaches aid in better comprehension of concepts in different subjects. For instance, numerous studies reported and explored students' perceptions of the improvement of content knowledge and skills (Affandi & Sukyadi, 2016; Botha, 2010; Mou, 2019). Thus project-based learning approach is considered an alternative form of learning to teacher-led education confirming its effectiveness in the teaching and learning process (Maros et al., 2023). According to Chen and Yong (2019), it is a process that has a significant positive effect on students' academic scores compared to traditional education. Therefore, this study intends to examine the effect of a project-based learning approach on academic scores in 6th-grade social studies in Bhutan.

Research objectives

Based on the global findings and impacts of the project-based learning approach, the study intended to:

- Examine the effectiveness of the project-based learning approach on academic scores.
- Explore the perception of students in a project-based learning approach.
- Investigate the perception of students for a project-based learning approach in comprehending learning concepts.

Research question

Principal question

How effective is a project-based learning approach in enhancing the 6th-grade students in social studies in improving academic scores?

Research sub-questions

- What are students' prior understandings of learning concepts?
- What do students think about the project-based learning approach?
- How might project-based learning activities help students better comprehend concepts?

Significance of the research

The teaching and learning process in Bhutanese classes is still dominated by teachers playing a central role, where students simply learn what the teacher dictates. Consequently, the teaching and learning processes in the class are teacher-driven. For instance, Dendup and Onthanee (2020) found that teachers in Bhutan still employ the conventional way of direct instruction to deliver and transfer knowledge and skills. Further, Rabgay (2018) mentions that this kind of instruction virtually never employs pioneering teaching strategies, and teaching methods are not effective. This problem can be addressed, for example, by encouraging teachers to employ cutting-edge, interactive teaching methods rather than conventional rote learning methods and considering ways to reform teaching methods (Dendup & Onthanee, 2020).

The project-based learning approach is considered an alternative to conventional ways of teacher-led instruction (Chen & Yang, 2018; Maros et al., 2023), and the project-based learning approach is one efficient and effective substitute for conventional direct instruction (Chen & Yang, 2018). However, the project-based learning approach cannot completely replace traditional teacher-led instruction (Maros et al., 2023). Additionally, the project-based learning approach promotes autonomy, collaboration, and reflection (Dorji, 2019). Hence, due to recent curricular changes in Bhutan, the teaching and learning processes in the classrooms are geared towards student-centered activities.

As a result, the teaching and learning approach where students work independently can be considered as an alternative form of teaching and learning process to teacher-led instruction whereas in the Bhutanese context, most of the teachers employ teacher-led instructions. Therefore, this study investigated the impact of the project-based learning approach on the academic scores of 6th-grade students in contrast to the teacher-led instructions in the class.

Research Methodology

Research design

The goal of the study was to investigate the impact of a project-based learning approach on academic scores for 6th-grade social studies. Pre-test and post-test as a quantitative method were used on a single group as part of the study's explanatory sequential mixed-methods research design (Nthimbane & Kazeni, 2019). The study consists of collecting and analysing quantitative data and qualitative data in two consecutive phases but in one study, subsequently, qualitative data explains and elaborates the quantitative data (Ivankova et al., 2006). Conceptual Test (CT) questions were administered as pre and post-test for gathering quantitative data and semi-structured interviews were used to focus and broaden findings from quantitative data.

Research instruments

Using the Conceptual Test (CT) questions as a pre-test, the student's prior knowledge and ideas were evaluated. Employing the same Conceptual Test (CT) questions, evaluated the impact of the project-based learning approach in boosting students' conceptual comprehension and was administered as a post-test. Consequently, students' perceptions of the project-based learning approach were qualitatively acquired through a semi-structured interview conducted in English. The data were separately examined to answer the research questions.

Research sample

Since there are only two sections of 6th-grade students at the research school for the academic year 2023. Researchers gathered data from both sections. The research employed purposive sampling to choose both sections of the 6th-grade students as the sample of the study consisting of 37 students. Researchers adhered to the ethical guidelines by getting the duly agreed consent forms from the student's respective parents. For semi-structured interviews, 10 students participated. Further, social studies in 6th grade in the Bhutanese curriculum is a subject that contains numerous activities, that are suitable to explore the learning of students through a project-based learning approach.

Validity and reliability

For the study to yield accurate results, the tools used must be valid and reliable. The research tools' precision and consistency are crucial components of research instruments (Taherdoost, 2016). Before the study, the validity and reliability of the achievement test were evaluated. A group of four experts with substantial knowledge and expertise in teaching in primary schools examined 15 multiple-choice questions which were then framed as a Conceptual Test (CT). The study's content validity was established and approved as a result. Additionally, by asking three specialists in qualitative research for their opinions and suggestions, the validity of the semi-structured interview questions was ensured.

Interventions

Before the interventions, lesson plans were developed on Strand III Human Wellbeing and the Environment following the guidelines of an instructional guide designed by the Department of Curriculum and Professional Development under the Ministry of Education and Skills Development. Students extensively reviewed the impact of human beings on the natural environment. And also provided required solutions using online resources from the internet and field visits to the school's makeshift waste collection and community waste collection sites. The intervention lasted for three weeks.

The intervention as a project-based learning approach was characterised by the guiding principle of Krajcik & Shin (2014) in which guiding and driving questions were provided on certain learning objectives. The intervention was designed by teachers to utilise driving questions to help students connect the task allocated with the underlying knowledge they should be learning. Further, the intervention was based on the premise that constructive investigation facilitates the development of prior knowledge. Subsequently, students worked cooperatively and individually using technologies such as YouTube videos, websites, and field trips and finally compiled extensive individual written reports

Result

The result of this study is presented in two sections. The first section consists of an analysis of the quantitative data that is a Conceptual Test (15 multiple choice questions) with histograms followed by a paired sample t-test. The second section consists of gathering the perspectives of students on the effectiveness of the project-based learning approach.

Quantitative data

The quantitative data from the pre-test and post-test of the achievement test were initially compared using histograms to gauge the differences in pre-test and post-test scores in the achievement test. The result is depicted below in Figure 1.

Figure 1

Histogram Comparing Pre-Test and Post-Test Scores

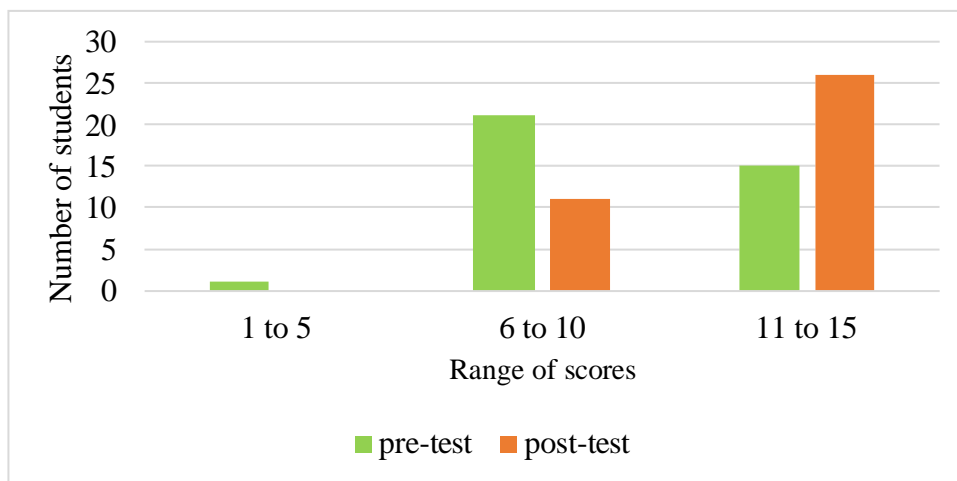


Figure 1 depicts a maximum number of students (36 out of 37 students) in the range of 6 to 10 and 11 to 15 in pre-test scores. The mean score of the pre-test was 9.5. After the intervention, all students scored between the range of 6 to 10 and 11 to 15. The mean score of the post-test was 11.97 with an improvement of 2.46 from the pre-test mean score. A paired sample t-test was used to determine a significant difference between the mean scores of the students’ pre-test and post-test. The result of the comparison is shown in Table 1.

Table 1

Paired Sample t-Test Comparison of the Performance of Students in the Pre-test and Post-tests

Assessment	N	Mean score(%)	SD	Mean score difference(%)	T	Df	p-value
Pre-test	37	9.51	2.22	2.46	-8.75	36	.000**
Post-test	37	11.97	1.94				

**p<0.000(critical value)

The result of paired sample t-test reported that students' performance in the post-test (mean = 11.97, SD = 1.94) was significantly higher than the pre-test (mean = 9.51, SD = 2.22) with $t(36) = -8.75, p = 0.000 < 0.5$ (see Table 1). Quantitative results suggested that students' performance in achievement tests improved significantly after the implementation of a project-based learning approach. From Cohen's d value of 1.44, it was noted that approximately 100% of students' performance in achievement tests that signified a larger effect (Sullivan & Feinn, 2012) is accounted for by the project-based learning approach implemented as an intervention during teaching and learning.

Qualitative data

To examine the effectiveness of the project-based learning approach on the academic score of 6th-grade social studies and prior understanding of concepts by students. We asked the following questions, what do children think about the project-based learning approach? How might project-based learning approach activities help students better comprehend learning concepts?

Braun and Clarke's thematic analysis was used to generate themes. According to Scharp and Sanders (2019), thematic analysis developed by Braun and Clarke consists of six steps, which entail becoming accustomed to the data, creating coding categories, creating themes, reviewing themes, defining and labelling themes, and finding examples. By analysing students' narratives, the impact of the project-based learning approach on academic scores was equated with students' perception of the project-based learning approach and better comprehension of topics taught through the project-based learning approach.

Students' perception of project-based learning approach.

Items from semi-structured interviews sought to determine the level of engagement in learning while performing a project-based learning approach attributing to an increase in academic scores. The findings indicate that 9 participants out of 10 agreed that the project-based learning approach engaged them compared to traditional classroom learning. Participants are of the view that in a traditional classroom, the teacher just explains the concept, however, in project-based learning, students explore additional information on the topic. For instance, the participant (std 9) mentioned, "In traditional classroom instruction, others teach us, but during the project-based learning approach we get to explore ourselves". However, 1 participant (std 5) explicitly mentioned that he preferred traditional classrooms more than project-

based learning since teachers' explanations enable them to comprehend more and explain in simple language. In sum, 9 participants out of 10 preferred a project-based learning approach over traditional classroom learning where instruction was driven by teachers.

Participants were engaged in a project-based learning approach on an individual and group level. Additionally, participants opined that the level of interaction was higher in the group compared to the individual level. 9 participants asserted that in the group, they had an avenue to discuss. Moreover, 9 participants individually shared their opinions, suggesting that the project-based learning approach generates discussion and facilitates learning in groups. Another participant (Std 3) asserted, "Working in groups or teams enhanced my learning experience during the project-based learning activity, as we shared our opinions on the topic and learned new things". Consequently, better collaboration and communication within the group facilitated vigorous engagement leading to better learning.

Better comprehension of the topic through a project-based learning approach.

Participants reported that the project-based learning approach improved comprehension and facilitated a deeper understanding of the topic assigned. Further, participants were able to make a meaningful connection between the information learned in the class and the real world. For instance, one participant (std 5) asserted, "Project-based learning helped me to understand the subject matter as we already learned about a particular topic, and searched for extra information and found additional points about it". Furthermore, 8 participants were of the view that making them visit the field enabled them to see the relevance of what they have learned in the class. Visiting the field encouraged participants to see the relevance of the material learned in the class.

It is apparent that participants were able to better comprehend the topic taught. Project-based learning approach involves students working on the project over an extended period. Participants work and investigate complex problems and challenging issues for a longer period. This study encouraged students to investigate challenging issues by providing driving questions. For example, one participant (std 3) mentioned, "Project-based learning approach is a good way to learn because we learn more when we search and discover information on our own and then visit the field". By engaging in a project-based learning approach students can develop a better understanding of the concept, through active and meaningful exploration.

Discussion

The study had two major findings: firstly, it showed an improvement in academic scores of the students after the use of a project-based learning approach and students were actively engaged in the group. The first finding was consistent with Balemen and Özer Keskin (2018) and Chen and Yang (2019) who found that the project-based learning approach significantly improved academic scores compared to the lecture method, which involved teacher-driven instruction. The finding was also congruent with the finding of Chen and Yang (2019) that there is a positive impact of the project-based learning approach on academic scores and further project-based learning serves as an alternative method to traditional teacher-led instruction.

In our study, several reasons could be attributed to the improvement in academic scores. Reasons for improving academic scores were characteristics of the project-based learning approach that were incorporated as important aspects of the project-based learning approach in our study. In line with Krajcik and Shin (2014) in students' project-based learning approach, we emphasised the guiding question, objectives, and use of technology, coupled with students' cooperation.

The project-based learning approach of our study consists of guiding questions. Moreover, it consists of finding solutions to various activities. Hence findings confirmed previous studies, where answers to the guiding question should be provided in written reports that include solutions and challenges, as well as data and selection criteria (Beneroso & Robinson, 2022). Further, participants in our study gathered enough data and information from the school information communication technology (ICT) lab. In the final phase of the project-based learning approach, participants submitted a best-written report of the activities assigned.

Project-based learning approach's key attribute consists of team building and collaborative abilities thereby effectively integrating theory and practice (Viro et al., 2020). Similarly, the findings of this study revealed that a project-based learning approach in groups facilitated collaborative skills. Participants shared their views with friends freely without intimidation, leading to a productive discussion on the assigned topic. The finding of this study is in line with the study conducted by Andriyani and Anam (2022) on the relationship between the project-based learning approach and collaborative skills, which pointed out that the project-based learning approach had a positive impact on more than 70 percent of students in building collaborative skills such as learners' motivation, communication skills, problem-solving skills, teamwork, and creativity. The voices of the study strongly argued that there are significant benefits of a project-based learning approach in groups.

Participants in this study were better equipped to understand the subjects since they could have comprehended the contents. Students actively develop knowledge, which contributes to an in-depth grasp of content. The results of this study are in agreement with Oguz-Unver and Arabacioglu's (2014) where the project-based learning approach involves activities that are concerned with the building of knowledge because it is founded on the principle of constructivism. Further, students are better able to comprehend different topics that are assigned as activities since they can construct meaning and connect it to real-life experiences such as field trips. According to the study by Wardah et al. (2022), students acquire 21st-century learning skills that are reflected in project-based learning approach model indicators like scientific knowledge, problem-solving abilities, and the capacity to work with others and encounter problems connected to the real world.

Conclusion

To sum up, the findings of this study suggest that the project-based learning approach improved the academic scores of 6th-grade students in social studies in one of the schools under Trashigang District in the eastern part of Bhutan. Predominantly, teaching and learning processes in Bhutanese classrooms are teacher-driven, where teachers play a central role. However, the findings of this study showed that the project-based learning approach fostered students to work autonomously facilitating a student-centered approach. The finding of the study revealed that most of the students were engaged during the project-based learning approach leading to an increase in academic scores. Learning through approach enhances student interest and motivation because it is frequently more engaging than the conventional lecture method. Most of the students were engaged when they participated in group work. In sum, the project-based learning approach promotes the maximum degree of student engagement at the group level.

Recommendation

The findings of this study are expected to contribute to the pool of knowledge that is contextually relevant to Bhutan and to the global context. There are numerous studies conducted on the effectiveness of the project-based learning approach in a global context. However, there are only a few studies conducted on the effectiveness of the project-based learning approach in Bhutan. Further studies must be conducted on the effectiveness of the project-based learning approach for higher classes and subjects such as history and geography since these subjects originate from social studies in lower classes.

The study mainly focuses on a particular demographic or geographical area, therefore limiting the generalisability of the findings to broader populations or diverse settings. Future studies can also garner the views of different stakeholders and explore variations in contextual factors such as teachers and parents on the effectiveness of the project-based learning approach.

References

- Affandi, A., & Sukyadi, D. (2016). Project-based learning and problem-based learning for EFL students' writing achievement at the tertiary level. *Rangsit Journal of Educational Studies*, 3(1), 23–40. <https://doi.org/10.14456/RJES.2016.2>
- Almulla, M. A. (2020). The effectiveness of the project-based learning (PBL) approach as a way to engage students in learning. *Sage Open*, 10(3), 1-15.
- Andriyani, S., & Anam, S. (2022). Exploring the relationship between project-based learning and collaborative skills: *EFL learners' voices. Al-Lisan: Jurnal Bahasa (e-Journal)*, 7(1), 51-63.
- Arantes do Amaral, J. A., & Lino dos Santos, R. J. R. (2018). Combining project-based learning and community-based research in a research methodology course: *The lessons learned. International Journal of Instruction*, 11(1), 47-60.
- Avila, G. (2019). Project-based Learning: *Projects for academic excellence* [Master thesis, California State University, Monter, Monterey Bay]
- Balemen, N., & Özer Keskin, M. (2018). The effectiveness of project-based learning on science education: A meta-analysis search. *International Online Journal of Education and Teaching (IOJET)*, 5(4), 849–865.
- Beneroso, D., & Robinson, J. (2022). Online project-based learning in engineering design: Supporting the acquisition of design skills. *Education for Chemical Engineers*, 38, 38-47.
- Boadu, G. (2015). Effective teaching in history: The perspectives of history student-teachers. *International Journal of Humanities and Social Science*, 3(1), 38-51.
- Botha, M. (2010). A project-based learning approach as a method of teaching entrepreneurship to a large group of undergraduate students in South Africa. *Education As Change*, 14(2), 213–232. <https://doi.org/10.1080/16823206.2010.522059>.

- Brundiers, K., & Wiek, A. (2013). Do we teach what we preach? An international comparison of problem- and project-based learning courses in sustainability.
- Chen, C. H., & Yang, Y. C. (2019). Revisiting the effects of project-based learning on students' academic achievement: A meta-analysis investigating moderators. *Educational Research Review*, 26, 71-81.
- Cintang, N., Setyowati, D. L., & Handayani, S. S. D. (2018). The obstacles and strategy of project-based learning implementation in elementary school. *Journal of Education and Learning (EduLearn)*, 12(1), 7-15.
- Condliffe, B., Quint, J., Visher, M. G., Bangser, M. R., Drohojowska, S., Saco, L., & Nelson, E. (2016). *Project-based learning: A literature review. MDRC: Working paper*. <https://www.mdrc.org/publication/project-based-learning>.
- Dendup, T., & Onthanee, A. (2020). Effectiveness of cooperative learning on English communicative ability of 4th grade students in Bhutan. *International Journal of Instruction*, 13(1), 255-266.
- Department of Curriculum and Professional Development. (2022). *National school curriculum, science curriculum framework classes pp- xii*.
- Dewey, J. (1902). *The child and curriculum*. University of Chicago Press.
- Dorji, C. (2019). *The use of project-based learning approach in teaching science to grade vi students in a Bhutanese classroom* [Doctoral dissertation, Rangsit University].
- Dorji, S. (2022). Teachers' perception on the feasibility of formative assessment in Bhutan. *Bhutan Journal of Management*, 2(1), 104-120.
- Han, S., Yalvac, B., Capraro, M. M., & Capraro, R. M. (2015). In-service teachers' implementation and understanding of STEM project-based learning. *Eurasia Journal of Mathematics, Science and Technology Education*, 11(1), 63-66.
- Ivankova, N. V., Creswell, J. W., & Stick, S. L. (2006). Using mixed-methods sequential explanatory design: *From theory to practice*. *Field methods*, 18(1), 3-20.
- Kliebard, H. (2004). *The struggle for the American curriculum 1893–1958* (3rd ed.). Routledge. <https://doi.org/10.4324/9680203339985>.
- Krajcik, J. S., & Shin, N. (2014). Project-based learning. In R. K. Sawyer (Ed.), *The Cambridge handbook of the learning sciences* (pp.265–296). (2nd ed.). Cambridge University Press. <https://doi.org/10.1016/CBO9681139519526.018>.

- Larmer, J., Mergendoller, J. R., & Boss, S. (2019). Gold standard PBL: Essential project design elements.
- Lenz, B., Wells, J., & Kingston, S. (2015). *Transforming schools using project-based learning, performance assessment, and common core standards (1st ed.)*. San, Francisco, CA: Jossey-Bass.
- Lhamo, T., & Chalermnirundorn, N. (2021). The use of ted talk videos to improve esl speaking skills of Bhutanese sixth-graders. *Research Journal Phranakhon Rajabhat: Social Sciences and Humanity*, 16(1), 218-236.
- Lim, S. W., Jawawi, R., Jaidin, J. H., & Roslan, R. (2023). Learning history through project-based learning. *Journal of Education and Learning (EduLearn)*, 17(1), 67-75.
- Loyens, S. M., Jones, S. H., Mikkers, J., & van Gog, T. (2015). Problem-based learning as a facilitator of conceptual change. *Learning and Instruction*, 38, 34-42.
- Maros, M., Korenkova, M., Fila, M., Levicky, M., & Schoberova, M. (2023). Project-based learning and its effectiveness: evidence from Slovakia. *Interactive Learning Environments*, 31(7), 4147-4155
- Mou, T.Y. (2019). Students' evaluation of their experiences with project-based learning in a 3D design class. *The Asia-Pacific Education Researcher*, 1–12. <https://doi.org/10.1007/s40299-019-00462-4>.
- Nthimbane, K., & Kazeni, M. (2019). Use of targeted web-based instruction to enhance learners' understanding of astronomy concepts. *International Conference on Mathematics, Science and Technology Education. Mopani Camp in Kruger National Park, Mpumalanga, South Africa*.
- Oguz-Unver, A., & Arabacioglu, S. (2014). A comparison of inquiry-based learning (IBL), problem-based learning (PBL) and project-based learning (PJBL) in science education. *Academia Journal of Educational Research*, 2(7), 120-128.
- Peldon, D., & Chalermnirundorn, N. (2018). The effects of cooperative learning strategies on sixth grade Bhutanese students' learning achievement and satisfaction in social studies class. *St. Theresa Journal of Humanities and Social Sciences*, 4(2), 1-29.
- Rabgay, T. (2018). The effect of using cooperative learning method on tenth-

- grade students' learning achievement and attitude towards biology. *International Journal of Instruction*, 11(2), 265-280. <http://doi.org/10.12963/iji.2018.11218a>.
- Royal Education Council. (2018). *National School Curriculum Conference 2016: Rethinking Curriculum* (7th ed.).
- Sasson, I., Yehuda, I., & Malkinson, N. (2018). Fostering the skills of critical thinking and question-posing in a project-based learning environment. *Thinking Skills and Creativity*, 29, 203–212.
- Scharp, K. M., & Sanders, M. L. (2019). What is a theme? Teaching thematic analysis in qualitative communication research methods. *Communication Teacher*, 33(2), 117-121.
- Sheppard, S. (2022). *A Curriculum development for 21st-century learners: Using project-based learning to teach the four Cs required for today and tomorrow's workforce* [Master dissertation, Otterbein University]
- Sullivan, G. M., & Feinn, R. (2012). Using effect size or why the P value is not enough. *Journal of Graduate Medical Education*, 4(3), 279-282.
- Taherdoost, H. (2016). Validity and reliability of the research instrument: How to test the validation of a questionnaire/survey in a research. *International Journal of Academic Research in Management*, 5(3), 28-36.
- Utha, K., Giri, K., Gurung, B., Giri, N., Kjær-Rasmussen, L. K., Keller, H. D., ... & Keller, K. D. (2016). *Quality of school education in Bhutan: Case studies in the perspective of Gross National Happiness and assessment practices*. Aalborg Universitetsforlag.
- Viro, E., Lehtonen, D., Joutsenlahti, J., & Tahvanainen, V. (2020). Teachers' perspectives on project-based learning in mathematics and science. *European Journal of Science and Mathematics Education*, 8(1), 12–31. <https://doi.org/10.30935/scimath/9544>.
- Wardah, I., Septaria, K., Mahbubah, K., & Mubarak, H. (2022). The effect of project based learning (PjBL) model on students' science literacy in social studies subjects. *Jurnal Penelitian dan Pengkajian Ilmu Pendidikan: e-Saintika*, 6(2), 108-119.

About the Authors

Kesang Wangchuk serves as the principal of Trashigang Middle Secondary School. Before taking the reins as principal, he served as a primary school teacher and vice principal. He earned a Master's Degree in Education from Lovely Professional University, which is situated in Chaheru, Phagwara, Punjab, India. Two of his papers were recently published in journals and conferences. His Majesty King Jigme Khesar Namgyel Wangchuk presented him with a certificate for leadership excellence. He took part in several regional, national, and international conferences on managing schools. The school (Trashigang Middle Secondary School) recently received a prestigious award for its diligent stakeholder engagement, which included the use of praxis and polis, ongoing stakeholder communication, and impressive stakeholder satisfaction results, as part of the program Nurturing Leadership's "To build conducive learning environments in the school through good practices" under his leadership.

Kinga Tshering is currently working as an Education Monitoring Officer under the Education Monitoring Division, under the Ministry of Education and Skills Development, and holds a Master's Degree in Education (physics). He published a few papers at international and national levels. He even presented at the seminars. The e-mail id is kingat@moesd.gov.bt.