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Practices, Opportunities and Challenges of Project-Based Learning in Developing 21st Century Competence in Teachers Education Colleges

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Abstract

The study explores the effectiveness of project-based learning in developing 21st-century skills in teacher education colleges. 63 instructors with a minimum of 2-year experience were selected from two colleges using a mixed-methods approach. Data was collected through questionnaires and interviews, and the results showed that project-based learning communicates better content knowledge and is more effective in fulfilling learning objectives. However, the practice of project-based learning in the sample colleges is moderate due to challenges such as lack of materials, lack of teacher training, and lack of student participation. The study concluded that intellectual challenge, authenticity, and empowerment are essential elements of project-based learning, encouraging students to be creative and innovative. College leaders should facilitate teacher training and provide necessary materials, while instructors should be committed to encouraging students to practice project-based learning based on their environment.

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INTRODUCTION

Preparing the next generation to behave in line with the world's constantly changing science and technology becomes the key issue when it comes to education. What students know, how they think, what they can do, and what they value must align with the demands of new technologies. Students in modern classrooms require more than just a solid academic foundation to succeed in university and beyond. So, teachers are occupied with expanding students' knowledge of foundational subjects and fostering their competency in the modern world. Modern classrooms focus on the needs of their students and incorporate science and technology into their lessons on a daily basis. Teachers are shifting their roles from lecturers to facilitators of learning, assisting students as they work through assignments and projects. The goal of a classroom in the twenty-first century is to better equip students for the world of tomorrow by enhancing their learning through the use of technology. Because technology permeates almost every

facet of modern life, it is crucial that students learn about it in the classroom. Modern classrooms put an emphasis on students gaining real-world experience and learning marketable skills that will help them succeed in their future careers.

But as the world gets more complicated, traditional classroom-based education is facing challenges from a lack of practical ability that won't work in the future. In terms of classroom architecture and student learning, the educational system is still very much in the dark ages. Modernizing the classroom is essential for enhancing the teaching-learning experience. So, educators need to abandon the conventional wisdom and adopt new forms of learning if they want to keep up with the modern world's increasing complexity (Raj, 2016). Doing things yourself is the best way for students to learn. As an example, "Tell me, and I forget" is a classic Chinese proverb. Tell me, and I'll keep it in my memory. Just get me involved, and I'll figure it out (Devkota et al., 2017). The adage represents the universally held belief that students learn best when they apply what they've learned in theoretical contexts to practical problems via project-based learning. Education officials and teachers alike have taken an interest in a new approach to classroom instruction: project-based learning. Based on the constructivist pedagogy, which promotes "deeper learning" via the practical search for real-life problems, project-based learning (PBL) places students at the center of the learning process (Hmelo, 2004). It is a method of teaching in which students gain understanding and competence by working on projects based on issues they could encounter in the actual world. Students' capacity for analytical and creative problem-solving is a primary goal of project-based learning. As an active learning strategy in the contemporary world, it is an inquiry-based approach to teaching where students address problems assigned as projects.

According to Hovey and Ferguson (2014), there are multiple understandings of PBL, with some names overlapping, such as PBL, inquiry-based PBL, problem learning, and project-method PBL. But comparing and defining project-based and problem-based learning is not easy. For the simple reason that what one school calls problem-based learning could sound a lot like what another calls project-based learning (Kolmos, 1996). The two go hand in hand because they both rely on inquiry to captivate kids. On the other hand, problem-based learning places greater emphasis on the fundamental conceptual understanding necessary to complete the job, whereas project-based learning is more concerned with actually completing the activity (Barron et al., 1998). While problem-based learning tends to be more content-or standards-focused and places an emphasis on explicitly utilizing collaboration to identify and seek a solution to an issue, project-based learning gives students greater agency in the direction they take and places an emphasis on process and product competences (James, 2014).

In contrast, student-centered approaches like project-and problem-based learning encourage students to take initiative while making use of classroom materials and technology. In order to foster critical thinking abilities in their pupils, both programs actively seek out information from a variety of sources.

Due to the similarities between activity-based learning and discovery-based learning, Holm (2011) provided a practice-based definition of project-based learning as follows: it is a form of student-centered instruction that takes place over a long period of time. During this time, students choose, plan, research, and create an authentic product, presentation, or performance that addresses a real-world question or challenge. According to Hmelo (2011), Markham (2011), and Stanley (2012), project-based learning is more than just a regular classroom technique; it's a means of conveying instructional approach that aims to educate students the competences needed to succeed in the modern global economy. Collaboration between instructors and students in solving authentic problems guided by an engaging question is at the heart of this teaching method, which also frequently incorporates inquiry skills and the presenting of study findings. Students' capacity for analytical and creative problem-solving is a primary goal of project-based learning. As an active learning approach, it is an inquiry-based way of learning in which students address issues assigned as projects. Students integrate knowing and doing when they apply their knowledge to address real-world challenges and aim to produce results. In recent years, project-based learning has gained recognition for its ability to help students develop 21st century abilities. These include the ability to think critically, creatively, communicate effectively, use information effectively, work in teams, and continue learning throughout their lives.

In response to the question, "What do students need to learn for their future lives in this 21st century era?"—a world that is rapidly evolving from the industrial to the knowledge and innovation time and self-direction skills—there is a global movement of education goals known as "21st century skills." These skills seek to transform traditional learning into a practical, real-world situation. The skills necessary for success in the modern academic environment are rooted in student-centered pedagogy and deep process learning, both of which can be acquired through project-based learning. The abilities stem from a set of higher-level thinking and communication competences that include a wide range of talents crucial to scientific achievement and problem-solving. It encourages pupils to continue learning throughout their lives. Collaborating with others to find solutions, effectively communicating those solutions, critically analyzing complex problems, and creatively generating new ideas to innovate technology are the four pillars of 21st century skills. Students who lack these abilities will struggle in the workplace and in life. Taking charge of one's own education is an important life skill, and project-based learning is a great way to hone that ability. This information about 21st-century abilities is summarized in Figure 1.

Modern competencies, depicted in the picture above, are those associated with higher education and necessitate project-based learning, student-centered pedagogy, and deep process learning. These qualities, which are fundamental for thriving in today's technology environment, stem from a foundation of higher-level thinking and communication skills. It encourages students to keep learning throughout their lives by preparing them to

adapt to a dynamic and unpredictable world. Preparation for learning, goal-setting, active participation in learning, and assessment of learning are the four stages. Opportunities and necessary components for deeper learning in a context related to career preparedness are presented by project-based learning. O'Brien (2021) argues that the characteristics of project-based learning—a multidisciplinary teaching approach, rigor, authenticity, and student-centeredness—allow students to get a deeper knowledge of the material.

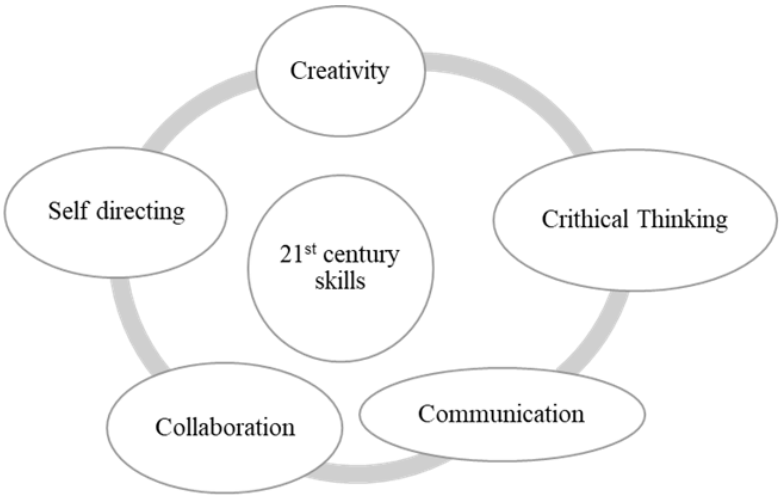

Figure 1 *21st century skills*

Additionally, it gives students agency over their own education by letting them decide how they will handle difficult concepts; this, in turn, teaches them to stick with a task until they achieve their goals.

In addition, the following key ideas are outlined by O'Brien (2021) as project-based learning's advantages and how it leads students to pay close attention:

Tough: PBL necessitates using what you've learned, not merely reciting it. Personalized learning (PBL) is more involved than memorization (which only evaluates one fact), and it can be utilized to evaluate students' ability to apply many academic concepts in different settings.

A content-specific, interdisciplinary instructional approach allows for the integration of many courses and promotes students to think about different subjects in relation to one another, rather than in isolation.

Real: It pushes kids to find answers to problems that really exist in the world. By giving them a chance to show their work to real people, it has an impact on their communities and lives.

As a great project-based learning strategy, Student Voice and Choice gives students a say in the product groups they form, as well as in their work process, time management, and resource allocation. By challenging them to think critically and creatively in pursuit of a meaningful objective, it frees students from the shackles of a top-down approach to learning. The ability to overcome obstacles more effectively is the essence of perseverance, which frequently

necessitates starting over after experiencing setbacks.

Projects that strike a good mix between being entertaining and presenting difficult ideas are those that provide intellectual challenge and satisfaction. Not only do they keep kids interested, but they also have difficult concepts that make them think critically. Student agency is fostered when they are encouraged to take charge of their own learning and when their successes are recognized and appreciated (Shaffer, 2018).

Students can better prepare themselves to tackle the challenges of a global society through the use of project-based learning under the "Building 21st-Century Skills" initiative. The following diagram provides a high-level overview of project-based learning and its main features.

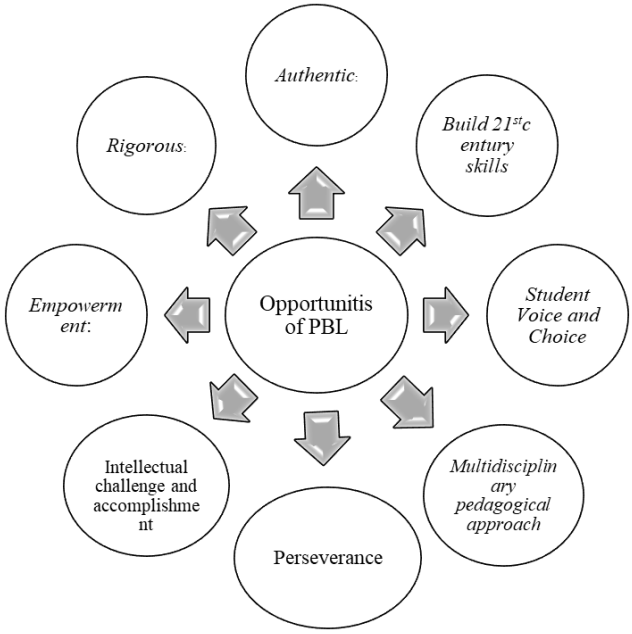

Figure 2 *Opportunities of Project-Based Learning*

The benefits and important features of project-based learning are shown in the above image. These include students' ability to demonstrate their talents in a real-world context, intellectual difficulties that help them gain new knowledge, and the empowerment of learners. On top of that, it's challenging, skill-based, and centered on a multi-disciplinary approach where students engage with their surroundings to learn more effectively. Plus, it helps students prepare for real-world challenges by teaching them to overcome setbacks with the knowledge they gain from their mistakes.

Students engage with their surroundings to acquire information and skills through project-based learning, which emphasizes an interdisciplinary approach. According to recent research (Murray & Savin-Baden, 2000; Ertmer & Simons, 2006), project oriented learning is seen as a powerful tool for helping students develop the high-level skills and transferable competencies that are in great demand. The constructivist pedagogy that has

long been at the heart of project-based learning is founded on the centrality of students' own meaning-making to the pedagogical practise (Hein, 2001). This would suggest that each person's understanding is a product of their own "experience and reflecting on that experience" (Richardson, 1997). This approach to education gives educators more agency in preparing students to meet the rigorous challenges posed by an ever-expanding human population. Consequently, project-based learning was invented to encourage student agency in their own education by means of the construction of authentic learning environments that necessitate the acquisition and application of prior knowledge in order to make sense of unfamiliar circumstances. According to Raj (2016), project-based learning is a top method for educating students to be competent in the modern world.

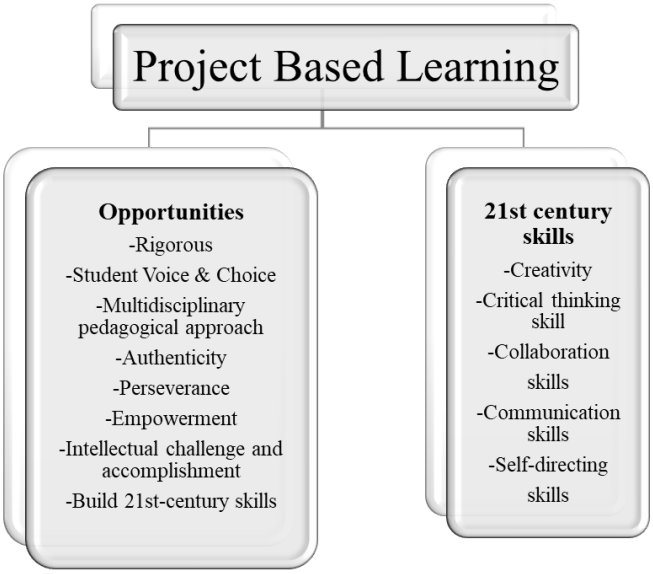

Figure 3 *Conceptual framework of the study*

According to the data shown above, there are several potential benefits and key components of project-based learning that help students acquire new information and abilities. The growth and refinement of abilities suitable for the modern world are subsequently aided by these possibilities and crucial components. Conversely, there are abilities that pave the way for pupils to produce competency sets appropriate to the modern world. All things considered, the fundamentals of project-based learning interact with these opportunities and talents of the modern day. The constructivist pedagogy that has long been at the heart of project-based learning has long held that students' own meaning-making processes are fundamental to effective education (Hein, 2001).

Since everyone's understanding is different, it follows that "experience and reflecting on that experience" is the only surefire way to gain insight (Richardson, 1997). Therefore, project-based learning was created to get students actively involved in their own

education by exposing them to activities that demand them to build upon and apply what they already know in order to make sense of unfamiliar contexts. According to proponents of project-based learning, the following characteristics characterize it: a focus on interdisciplinary study; student agency and collaboration in solving real-world problems; teacher facilitation and guidance; students' production of genuine products as a result of their work; and internalization of multiple perspectives. With the help of collaborative research and projects that showcase their knowledge, students are able to acquire new and practical technological competencies, which in turn help them become effective communicators and creative problem solvers (Bell et al., 2010).

There is a lack of project-based learning in actual classroom settings, even though research has shown that immersing students in real-world scenarios improves their knowledge of how to learn. In addition, project-based learning is not only difficult to implement, but also comes with a lot of new ways for planning, facilitating, and assessing (Mary, 2013). The greatest difficulty, according to James (2014), was in developing project-based learning and fitting it into school schedules. Consequently, this study looked at the possibilities, threats, and practices of project-based learning (PBL) in teacher preparation programs at the university level. It also looked at how teachers deal with these issues and how they might help their students become competent in the modern world. Next, the following research questions were derived from the study's objective, which was to investigate project-based learning practices, opportunities, and challenges in order to equip students with 21st century skills. This will enable them to become productive and effective citizens of the country, as well as to contribute to its development.

In project-based learning, what are the cornerstones?

i. *What are some ways that project-based learning might enhance the instruction of competences relevant to the modern world?*
ii. *How are project-based learning approaches now being implemented in Wollega Zones' teachers' college of education?*
iii. *How difficult is it for institutions that train teachers to include project-based learning into their curricula?*

MATERIALS AND METHODS

The research strategy for this study is a mixed-methods approach. According to Creswell (2012), this approach combines quantitative and qualitative data in a single study to uncover the same underlying phenomenon. Also, the study used a quasi-quadratic explanatory design, which gives greater weight to quantitative data than qualitative data. Utilizing the standard protocol for subsequent explanations, this study prioritized gathering quantitative data before moving on to gather qualitative data that could shed light on the quantitative results.

College of Education faculty and administrators (deans and heads of academic affairs) in Wollega Zones made up the study's

population. The faculty and administration of Shambu and Nekemte Teachers' Education Colleges were chosen at random from among the three colleges in the Wollega zone. So, a total of 63 instructors (or 59% of the total) were chosen and included in the study; this was achieved by selecting 23 (64% of the total) from the Shambu teachers' education college and 40 (56% of the total) from the Nekemte college. Lastly, two colleges' deans and academic affairs directors were interviewed using the availability sampling method.

Instruments for Data Collection

Data was gathered through the use of an interview and a questionnaire. Quantitative methods relied on closed-ended surveys for their data, whereas qualitative methods supplemented and validated the quantitative data with information gathered from open-ended questions and interviews. Following the pilot study, the questionnaire was administered to participants using a five-point Likert scale: 1 = never, 2 = seldom, 3 = occasionally, 4 = most of the time, and 5 = often. This was done to examine the practical usage of the questionnaire. The instruments' reliability was verified using the Cronbach Alpha coefficient, which is a statistical test available in SPSS version 25. Additionally, 26 questions were used to measure the potential of project-based learning, and their reliability was 0.92. Fifteen items were used to measure the challenge of project-based learning, and their reliability was 0.89. In the end, five sub-skills were derived from the practice of 21st century talents, which were assessed using 29 items. The following abilities are included: critical thinking (with 6 items and an overall reliability of.82), collaboration (6 items and an overall reliability of.81), communication (5 items and an overall reliability of.80), creativity and innovation (5 items and an overall reliability of.86), and self-direction (7 items and an overall reliability of.83). With a total of 29 items, the dependability is 0.94. The specialists also made sure the tools were legitimate. Descriptive statistics such as mean, frequency, percentage, and standard deviation were used for quantitative data analysis, while theme analysis was utilized for qualitative data.

RESULTS AND DISCUSSION

Results

Out of the total questionnaires issued to college instructors, 63 (80.8%) were retained as respondents; of these, 8 (12.7%) were female, indicating that there were very few female participants. This suggests that, in comparison to the number of male students, there were relatively few female instructors at secondary schools. Regarding their years of teaching experience, the majority of them (28, or 44.4%), have been in the profession for 10 years or more, while the smallest group, consisting of 20, had 31.8% of experience ranging from 2 to 5 years. Based on the data, it appears that the majority of respondents had positive experiences with both teaching and learning. This likely allowed them to provide honest responses, which ultimately helped the researcher form conclusions. The study encompassed six domains: mathematics, the arts, education, language, social science, and the natural and social sciences. This diversity of disciplines also aids in investigating the potential of project-based learning to foster the development of skill sets appropriate to the modern workplace.

Table 1

Descriptive statistics measure of project-based learning opportunity

S.No.	Item	Never	Rarely	Some times	Most of the time	Always	Total
1	Project-based learning is effective in fulfilling learning objectives.	-	1 (1.6)	22 (34.9)	27 (42.9)	13 (20.6)	63 (100)
2	Project-based learning imparts better content knowledge of the topic.	-	1 (1.6)	21 (33.3)	30 (47.6)	11 (17.5)	63 (100)
3	Project-based learning encourages students to learn in context.	-	-	9 (14.3)	31 (49.2)	23 (36.5)	63 (100)
4	Project-based learning promotes the retention and recall of knowledge.	-	2 (3.2)	7 (11.1)	37 (58.7)	17 (27.0)	63 (100)
5	Project-based learning promotes participation in the learning process.	-	1 (1.6)	8 (12.7)	35 (55.6)	19 (30.2)	63 (100)
6	Project-based learning promotes critical thinking skills on the topic.	-	-	16 (25.4)	26 (41.3)	21 (33.3)	63 (100)
7	Project-based learning promotes self-directed learning.	-	2 (3.2)	13 (20.6)	27 (42.9)	21 (33.3)	63 (100)
8	Project-based learning promotes group-dependent skills.	8 (12.7)	38 (60.3)	17 (27)	-	-	63 (100)
9	Project-based learning promotes communication skills.	1 (1.6)	2 (3.2)	10 (15.9)	29 (46)	21 (33.3)	63 (100)
10	Project-based learning makes learning interesting and fun.	-	1 (1.6)	12 (19.0)	29 (46.0)	29 (46.0)	63 (100)
11	Project-based learning promotes exploring different resource materials.	-	-	9 (14.3)	28 (44.4)	26 (41.3)	63 (100)
12	Project-based learning supports the growth of mindsets and ways of thinking.	-	-	18 (28.6)	27 (42.9)	18 (28.6)	63 (100)
13	Project-based learning promotes self-advocacy and discovery.	-	2 (3.2)	12 (19.0)	32 (50.8)	17 (27.0)	63 (100)
14	Project-based learning gives students ownership of their own learning.	-	1 (106)	11 (17.5)	30 (47.6)	21 (33.3)	63 (100)
15	Project-based learning increases the incorporation of creativity in lessons.	-	3 (4.8)	11 (17.5)	33 (52.04)	16 (25.4)	63 (100)
16	Project-based learning Provides opportunities for flexible learning.	-	1 (1.6)	14 (22.2)	33 (42.4)	15 (23.8)	63 (100)
17	In project-based learning, teaching becomes facilitated.	-	-	14 (22.2)	31 (49.2)	18 (28.6)	63 (100)
18	Project-based learning provides the structure for instructional ideas.	-	1 (1.6)	11 (17.5)	38 (60.3)	13 (20.6)	63 (100)
19	Project-based learning develops student confidence.	-	1 (1.6)	7 (11.1)	32 (50.8)	23 (36.5)	63 (100)
20	In project-based learning, students are open to new ideas.	-	-	8 (12.7)	32 (50.8)	23 (36.5)	63 (100)

Table.1 continues...

21	In project-based learning, hands-on experiences.	-	1 (1.6)	15 (23.8)	33 (52.4)	14 (22.2)	63 (100)
22	Project-based learning promotes student engagement.	-	6(9.5)	14 (22.2)	26 (41.3)	17 (27.0)	63 (100)
23	Project-based learning leads to a deeper understanding of content.	-	2 (3.2)	13 (20.6)	37 (57.8)	11 (17.5)	63 (100)
24	Project-based learning promotes communication and collaboration skills.	2 (3.2)	7 (11.1)	33 (52.4)	19 (30.2)	2 (3.2)	63 (100)
25	Project-based learning promotes meaningful real-life experiences.	-	2 (3.2)	13 (20.6)	31 (49.2)	17 (27)	63 (100)
26	Project-based learning is student-oriented learning.	1 (1.6)	1 (1.6)	12 (19.0)	31 (49.2)	18 (28.6)	63 (100)

Table 1 shows the percentage of replies indicating that PBL helps with competency in the modern world, broken down by how often it occurs. Each opportunity for project-based learning (PBL) that fosters 21st-century abilities had its responses weighted to determine the highest and lowest rated frequency classification. As a result, the majority of the sixty-three participants' answers (63.5% and 92.0%, respectively) fell into the "most of the time" and "always" categories, with the exception of questions 8 and 24, respectively. This shown that teaching 21st-century skills through project-based learning is significantly more effective. Based on the comments, it can be inferred that PBL fostered the development of growth mindsets, self-discovery, knowledge retention, and confidence in students. This is because PBL emphasizes a better grasp of subject through a process of learning through real-life experiences. Students' communication skills are improved since PBL requires them to work together and interact with one another to help each other learn. In addition, projects-based learning (PBL) encourages students to think critically and creatively by exposing them to new ideas based on agreed-upon content in a specific context through the exploration of various resource resources. By bringing together students with a wide range of backgrounds, interests, and skill sets, PBL enhances group work, adds depth to lessons, and makes learning an enjoyable experience overall. Therefore, PBL was more successful in achieving learning objectives by guaranteeing 21st-century abilities and imparting greater topic knowledge because students actively developed these skills while working on the allotted project.

Table 2

The practice of 21st-century skills in problem-based learning

Variables	Mean	Std. Deviation
Critical thinking	3.50	0.75
Collaboration	3.58	0.84
Communication	3. 32	0.94

Table. 2 continues…

Creativity and innovation	3.40	0.89
Self-directing	3.42	0.85

Challenges of Project Based Learning

Table 2 shows that all four subscales were ordinary, with the exception of the first two, which measured critical thinking and teamwork, which had somewhat higher-than-average averages. As a result, it appears that teamwork and critical thinking are more heavily emphasized than the other abilities, such as communication, creativity, invention, and self-direction. Nevertheless, it can be inferred from the results that problem-based learning was only somewhat used and not as successfully applied in order to help improve students' 21st-century skills in college-level teacher preparation programs. Possible cause: students lacked real, rather than theoretical, experience with project-based learning, which hindered its potential to improve instruction and foster the development of skills appropriate to the modern world.

Analysis of open-ended and interview questions

Students gain a diverse body of knowledge through project-based learning because each activity requires time and a variety of reference materials. Learning through project-based learning enhances creative activity, which in turn makes learning permanent and lifelong. Skills in socialization, teamwork, and communication are enhanced through project-based learning. It aids in the development of demonstrative abilities and learning via experience. Learning by doing in a project-based learning environment boosts confidence and allows for more creative expression (Table 3). Since it allows students to choose their own activities and is based on real-life scenarios, project-based learning is genuine. Another complicated aspect of project-based learning is the fact that it encourages students to ask difficult and thought-provoking questions. Since the learning process culminates in the final output, project-based learning necessitates perseverance. Since project-based learning is still relatively new to most educators, it is not currently being used in the classroom. On the other hand, a few professors were pushing for independent project design by assigning group projects that could be completed with library research and by demanding that students produce a final product within a semester. Lab work, action research, seminars, and hard sciences like mathematics and physics, as well as natural science classes like biology, chemistry, and physics, were more suited to project-based learning. Nevertheless, when teachers put in the time and effort to develop and oversee the project, students learn all subjects through project-based learning.

Table 3

Descriptive measure of project-based learning challenges

S. No	Item	Least challenging	Somewhat challenging	Real challenging	Seriously challenging	Most challenging	Total
1	Lack of time to plan and implement	4 (6.3)	10 (15.9)	19 (30.2)	21 (33.3)	9 (14.3)	63 (100)
2	Implementing the project within the schedule	-	12 (19.0)	24 (38.1)	23 (36.5)	4 (6.3)	63 (100)
3	Fitting all of the standards	2 (3.2)	11 (17.5)	18 (28.6)	19 (30.2)	13 (20.6)	63 (100)
4	Lack of knowledge and skill to design the project	5 (7.9)	8 (12.7)	21 (33.3)	19 (30.2)	10 (15.9)	63 (100)
5	Assessing the project to determine students' grade	1 (1.6)	8 (12.7)	25 (39.7)	17 (27.0)	12 (19.0)	63 (100)
6	Creating the project or coming up with the project idea	2 (3.2)	14 (22.2)	19 (30.2)	22 (34.9)	6 (9.5)	63 (100)
7	Collaborating with other teachers	3 (4.8)	12 (19.0)	21 (33.3)	20 (31.7)	7 (11.1)	63 (100)
8	Managing the student groups	2 (3.2)	10 (15.9)	24 (38.1)	24 (38.1)	3 (4.8)	63 (100)
9	Shifting from directing the instruction to facilitating group work	2 (3.2)	10 (15.9)	26 (41.3)	17 27.0)	8 (12.7)	63 (100)
10	The curriculum is artificial which is not based upon authentic	2 (3.2)	1 (1.6)	20 (31.7)	26 (41.3)	14 (22.2)	63 (100)
11	Lack of necessary materials required for projects	1 (1.6)	7 (11.1)	16 (25.4)	26 (41.3)	13 (20.6)	63 (100)
12	Lack of trained personnel that can lead project based learning	-	12 (19.0)	18 (28.6)	23 (36.5)	10 (15.9)	63 (100)
13	Lack of focus on identified learning outcomes	2 (3.2)	10 (15.9)	24 (38.1)	19 (30.2)	8 (27.0)	63 (100)
14	Superficial teachers knowledge of content (subject matter)	1 (1.6)	9 (14.3)	19 (30.2)	27 (42.9)	7 (11.1)	63 (100)
15	Lack of clear implementation of project guidelines	-	8 (12.7)	31 (49.2)	15 (23.8)	9 (14.3)	63 (100)

Despite the importance of PBL learning, students do not acquire concrete and cohesive knowledge, and they face a number of problems. For example, there is a dearth of qualified personnel to design and implement project-based learning, administrators aren't on board with the idea, and neither instructors nor students are fully engaged. Also, college students aren't as familiar with project-based learning as high school students are. More importantly, when using project-based learning approaches, it might be challenging to gauge each student's pace and skill level.

DISCUSSION

Findings from the study and their relevance to the existing literature formed the basis of the discussion. The results demonstrate that problem-based learning (PBL) helps students develop many skills beyond just academic subject knowledge. These include the ability to work together, communicate effectively (both verbally and in writing), think critically, and be creative when faced with challenges. Similarly, Rais et al. (2021) found that when it comes to developing students' ability to learn in the modern world, project-based learning is more effective than problem-based learning. In addition, students ranked creativity tasks as the most common, with teamwork, critical thinking, and communication following closely behind, according to Rebecca's (2018) research. Plus, PBL's complexity means that students learn more than just the four Cs—skills that are essential in the modern world. Students can gain confidence, social skills, and competence in interpersonal relationships through classroom discussion and collaboration (Markham, 2011; Sahin and Top, 2015; Wan et al., 2016). Students in project-based learning (PBL) are encouraged to be "open to new ideas" and to engage in activities that foster communication. By doing so, they form a "community" among themselves and their classmates, which can be beneficial when collaborating to achieve a shared objective. Thus, project-based learning greatly aids in imparting skills appropriate to the modern world.

All students who have experienced a PBL environment noticeably gain in competency, according to a prior finding by Mosier et al. (2016). Furthermore, the study found that "*low ability*" students have 46% increases in critical thinking and cooperation competencies when they are "immersed in a PBL environment." Not only that, but "high ability" kids show a 66% improvement in these same areas. All students, from high achievers to those with lower scores, can benefit from PBL in order to enhance their competency in the modern world. Consequently, PBL aids in preparing all students, regardless of their cognitive capacities, for a world that is always evolving. Additionally, students acquire demonstrative learning abilities through project-based learning, which helps them flourish in today's market by allowing them to publicly display their creations. Furthermore, in project-based learning, the onus is on the student to show initiative, originality, and responsiveness in their work. In project-based learning (PBL), students draw on their own unique experiences to inform their learning. In PBL, students work together to complete activities, which allows each student to showcase their creativity and unique set of skills that will ultimately benefit the project. Therefore, the group's ability to work together and showcase their knowledge can be shaped by the different skillsets of its members.

The results of Morrison et al. (2015) indicate that students may be able to improve their test scores through the use of project-based learning. After two years of project-based learning, students in public secondary schools outperformed their peers who did not engage in the program on end-of-year examinations, according to research. This data demonstrates that students are able to retain

and recall more material after engaging in project-based learning. Although memorization is not always a skill needed in the modern workplace, students will have a leg up when they enter the workforce if they have access to a wealth of material that is easily available (Lapek, 2018). Another study found that students do better in school when they work on group projects. This is because, according to Prettyman et al. (2012), such an approach fosters an interdisciplinary culture that draws on knowledge from other fields to address real-world problems. Since real-world challenges are not centered on a single subject topic, project-based learning allows students to learn in any situation by integrating multiple content areas. So, students can acquire experience working in transdisciplinary scenarios while developing 21st-century abilities through project-based learning (Lapek, 2018).

Social skills, academic skills, and personal skills were the three main areas where the PBL approach was found to make a difference. Academic abilities encompass students' capacity for organized study, research design and execution, active learning (creativity and critical thinking), and problem solving, whereas social skills encompass interaction with others and the ability to communicate effectively. The second type of skill is more intangible and pertains to the individual's growth in areas such as self-reliance, self-assurance, initiative, and public speaking (Baysura, 2016). Building self-confidence and empowering students to take charge of their own learning, providing a wealth of information by getting them to practice and then be productive, and fostering 21st-century skills are all important components of project-based learning. Since it is a genuine and intellectually stimulating paradigm, the results demonstrated that project-based learning is grounded in real-life scenarios. By teaching kids to persevere, be patient, and tolerate challenging questions, it inspires pupils to be creative and imaginative. With project-based learning, students are given the freedom to choose their own activities and work towards real outcomes, rather than being spoon-fed by teachers. As a result, students develop a sense of curiosity and become more engaged in their own learning. Participating in practical learning experiences, such as project-based learning, helps students become independent thinkers and equips them with a set of competencies appropriate to the modern world (Strimel, 2014). Additionally, students need to engage in realistic project-based learning opportunities to acquire 21st-century skills by learning in suitable and real-world contexts. This is due to the fact that chances for project-based learning have been shown to improve comprehension of fundamental concepts and motivate creative learning (Clark & Ernst, 2007).

In addition, the results showed that students are more engaged and willing to take on difficult tasks when they are involved in meaningful activities (Morrison et al., 2015). Students improve their academic topic knowledge and 21st-century competency skills when they persist through challenging assignments, which in turn increases the amount of time they spend learning. Students may acquire skills appropriate to the modern world by taking part in project-based learning

and working to find solutions to authentic challenges. Moreover, students may get a sense of mastery over their own learning processes through project-based learning, and it also caters to a variety of learning styles (Morrison et al., 2015).

The results reveal moderate practice across the board when it comes to talents. Some teachers said they weren't using project-based learning, while others encouraged students to develop their own projects in response to interview equations and open-ended questions. Having students work in groups and complete projects over the course of a semester is as simple as assigning them to use various library resources. Additionally, it was seen from the responses that many courses, including those in the hard sciences and natural sciences (including laboratory work), general teaching methods, curriculum, psychology, action research, and seminars all used project-based learning. In the realm of music, it was also common practice to have pupils showcase traditional instruments using a variety of materials. This lends credence to the conclusion drawn from quantitative analysis and suggests that project-based learning is implemented to a certain degree across all academic departments in colleges of education. Furthermore, the results demonstrate that teachers in each profession put in very little effort to implement project-based learning, as there is little effort put into planning, managing, and completing the project. Possible causes include administrators' lack of support, college staff's lack of familiarity with project-based learning, insufficient resources for project designers, and a lack of motivation for project planners and designers. In addition, there are a number of obstacles to implementing project-based learning, such as not having enough trained personnel to generate project ideas, not having enough concerned bodies in project-based learning, teachers' and students' lack of commitment and participation, time constraints, teachers' workload, and not even thinking about project-based learning as a teaching method.

Baysura (2016) found the same thing after classifying the difficulties of implementing PBL as either pertaining to the students, the teachers, or the environment. In particular, he detailed the reasons why students lacked enthusiasm for project-based learning (PBL): they weren't prepared, there was unfair distribution of responsibilities within project groups, students used questionable sources, they lacked research skills, and they couldn't work together on assignments. Managing the classroom, coming up with new project topics, and evaluating projects (including the process) were all challenges for teachers. Some educators have noted learning environment issues, such as overcrowding in the classroom, insufficient resources, and insufficient time allotment in comparison to the duration of the project, alongside student and teacher-related issues.

CONCLUSIONS

Demonstrative learning abilities are continually being worked on in project-based learning. Students are always being asked to showcase their goods in front of an audience. Students in project-based learning take pride in their work and are encouraged to think critically and creatively about how their

personal experiences and knowledge might shape the final product. In addition, the results show that project-based learning might help kids succeed academically by fostering an interdisciplinary culture that incorporates several subjects. Therefore, it was proposed that students have a better grasp of fundamental concepts through project-based learning, which in turn promotes deep and creative learning, increases memorization capacity, and is grounded in real-world exercises.

Instead of having students follow teachers' lead, project-based learning encourages them to take an active role in their education by deciding which activities to work on and how to complete them. Consequently, it is reasonable to assume that students who participate in project-based learning acquire a suite of 21st-century competencies, including the ability to think critically, creatively, independently, and in collaboration with others; as well as strong interpersonal, social, and self-esteem skills. Therefore, it is important to raise students' consciousness about the fact that PBL can promote learning that cultivates a variety of skills that are compatible with those required in the modern world. According to the results, several classes attempted to incorporate project-based learning—including action research and laboratory work—but failed miserably because the projects were only given as semester-long tasks. Because instructors put in so little time and energy into planning and executing projects, it follows that project-based learning is implemented to a limited degree across all disciplines in schools of education.

The results showed that there were a number of obstacles to the method's implementation, including insufficient funding and other resources, administrative resistance, and students' unfamiliarity with project-based learning as a teaching strategy. Problems in implementing project-based learning included: figuring out how students learn, how fast they learn, what their abilities are, whether or not teachers are committed, whether or not students are involved, and how much time we have.

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DECLARATION

No conflict of interest has been identified.

DATA AVAILABILITY

The data that support the findings are available from the corresponding author.

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