Problem-based learning and 21st Century skills – A Literature Review

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Abstract

This paper presents a critical review on Problem based learning (PBL), constructivist pedagogy concerning 21st -century skills. 21st -century skills are the skills that are required goals of every educational system around the globe in the 21st century. Every education system aspires to work and want to see their students, 21st -century learner. These skills are knowledge acquisition, attitudes, creativity, critical thinking skills, problem-solving skills, communication skills, and collaborative learning. In this concern, the PBL approach in the teaching-learning process can provide possible solutions to incumbent problems of the education system. In this paper, the investigator reviewed the literature related to PBL and 21st- century skills in the period of 2000-2018 in the disciplines of sciences and medical sciences.

Introduction

Our global ecosystem is changing environmental, economical, and social aspects. The advancement of technology in every arena of life has changed the landscape of our actions. This has exacerbated the challenges in terms of depleting resources, environmental crisis, inequitable distributions, and dismayed societies where well-being is a far-flung idea. These concerns are echoed in OECD 2018 learning framework for 2030. Education can provide such opportunities that can prepare students entering the schools today for unprecedented tomorrows as the problems of tomorrow are unavoidable and unpredictable. Therefore, education should be such that it equips the learner through a myriad of experiences with curiosity, resilience, and problem-solving abilities. The literature suggests that the need for 21st Century Skills at the global level is dictated by a combination of many factors, including the change in societies resulting from the rapid spread of technology, increasing globalization and internationalization, and the shift from industrial social economies to information and knowledge-based social economies (Voogt & Roblin, 2010). Discussion about the 21st century started with UNESCO's Delors (1996) Report prepared by the International Commission on Education for the Twenty-First Century. Four principles outlined in the report, as the four pillars of education: a) Learning to know means learning to learn, b) Learning to do which means not only occupational capacities, but also the ability to deal with diverse situations, c) Learning to live together or learning to live with others means mutual understanding along with acceptance and respect of the plurality of human beings, and d) Learning to be

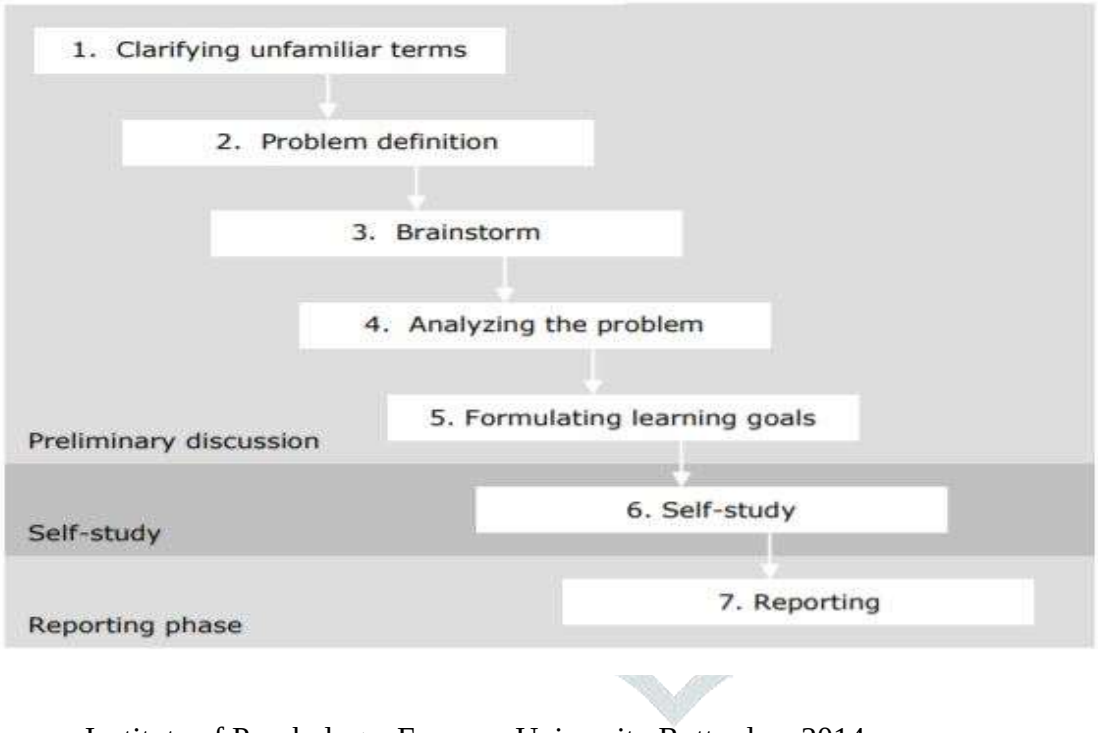
that develops autonomy and personal responsibility towards society. (Salas-Pilco, S. Z. (2013) Luna Scott (2015) defines '21st Century Skills' as 'the knowledge, skills, and attitudes necessary to be competitive in the twenty-first-century workforce, participate appropriately in an increasingly 9 diverse society, use new technologies and cope with rapidly changing workplaces. As suggested by Kenworthy and Kielstra (2015) that in next coming years, problem-solving, teamwork, and communication are the top three skills that companies will require and will be in the need of.

As these concerns are important for any educational system around the globe but most of the educational system used a teacher-centered approach in their educational institutions by ignoring the student-centered aspect of learning. However, these teacher-centered strategies do not often allow for the development of 21st-century skills like creativity, critical thinking, or problem-solving, which are essential for success in the modern world. One of the best ways to promote the development of 21st- century skills, properly prepare our students for the future, and combat ineffective teacher-centered instruction is through problem-based learning (PBL). Advocates of 21st -century skills stress the importance of student-centered methods like PBL or project-based learning. PBL and other student-centered teaching methods are widely acknowledged as being effective, even if they pose classroom management challenges to teachers (Rotherham & Willingham, 2009). As highlighted by P21 (2007) 'Project and problem-based learning are ideal instructional models for meeting the objectives of twenty-first-century education, because they employ the 4Cs Principle – critical thinking, communication, collaboration, and creativity – alongside 'teaching for transfer' and learning structure in real-world contexts. Solving real-world problems draw on multiple forms of expertise'

The essence of teaching 21st-century skills is for students to "learn to develop their own ideas," test and share those ideas, and take input from their teachers and peers to further develop their ideas (Prettyman et al., 2012). This type of teaching and learning is best reflected in the PBL approach. PBL is an educational method that provides students with authentic learning opportunities with a focus on teaching through real-life situations and solving real-world problems. Our education system being a part of the current information society only serves bundles of data and information without giving context or personal meaning to that information. Such a shift demands changes in the way we look at the nature of knowledge and subsequently changes in the nature of participation in the classroom (Tan, 2003). Of many active learning approaches, Problem Based Learning (PBL) can facilitate the shift by reflecting the real-world problems in the classroom setting thereby providing an impetus to the development of 21st-century skills i.e. problem-solving abilities, communication skills, critical thinking, and process skills centered on the goal of "how to learn".

Problem-based learning: Problem-based learning (PBL) is an "active and dynamic learning" teaching method in which complex and ill-structured real-world problems are used as the vehicle to promote students' learning of concepts and principles as opposed to the usage of passive, spoon-fed rote learning method (Kwan, 2002). In other words, learning with ill-structured problems in PBL reflects real life in itself where any problem needs multiple aspects to being understood and to solve with multiple solutions. This enhances students' self-directed learning and high-order skills of collaborative learning and critical thinking. The basic principles of this method are the use of realistic problems as the starting point of self-directed, small-group-based learning guided by a tutor who acts as a process guide rather than a point of knowledge transfer (Barrows, 1986). Holistically, we can say that PBL as an approach allows thinking in different ways to solve a problem by internalizing problem-solving competencies (Tan, 2003)

Figure 1. Steps of PBL process



Source: Institute of Psychology, Erasmus University Rotterdam 2014

Objective

This paper critically reviewed the literature related to PBL and 21st-century skills i.e. cognitive skills, problem-solving skills, critical thinking, self-directed learning, group work. Review is done from 2000 to 2018. Types of studies included in this review are experimental, mixed-method studies, qualitative studies as well as meta-analyses.

Review on Problem based learning and 21st-century skills

Fasce et al. (2001) compared problem-based learning with traditional teaching methods i In the physics course. The sample for the study was first-year medical students and was separated into two groups (experiment and control group). Both groups were subjected to the same knowledge and qualitative evaluations. Results showed that at the end of the course, both groups performed similarly in cognitive performance. However, students of problem- based learning group were evaluated better than their counterparts in teaching methodology and process. Physics education, using problem-based learning, obtain the same cognitive results but a higher degree of satisfaction was observed in the PBL group than the control group.

Cooke & Moyle (2002) examined students' evaluations of the use of problem-based learning in comparison to 'traditional' discipline-structured nursing degree. The study was conducted for 4 week period. The sample for this study was 130 students having 2 years of experience in problem-based learning. Results showed that problem-based learning promoted critical thinking and problem -solving; active participation among students in the learning process. The study also concluded that learning in PBL was realistic, fun, and interesting for students.

Baig and Asad (2003) evaluated the effect of problem-based learning (PBL) on the attitude/learning abilities of students studying in fourth-year MBBS who were more accustomed to conventional teaching. 32 students of Karachi Medical and Dental College were taken for this study by using an interventional study design. Results revealed a significant change in study trend as well as analytical ability in two PBL sessions. Students' professional grades were significantly higher than the previous year's grades.

Kumta et al. (2003) evaluated the effectiveness of an online PBL multimedia program in supporting student development of critical thinking skills, in particular clinical reasoning, logical thinking, analytic ability, and problem-solving ability, during a 3-week orthopedic surgery rotation. Participants (N = 163) were randomly assigned into either the control or experimental condition in clusters of 15 students. The findings of this study revealed that students in the experimental condition performed significantly better on the post-test scores than students in the control group. The findings also revealed that students in the experimental condition spent significantly more time in the wards beyond bedside tutorials. The researchers concluded by saying that the PBL approach fostered clinical and critical thinking skills in medical students and allowed them to engage in complex problem-solving tasks without endangering patient safety.

Habib et al. (2006) conducted a study to assess the perceptions and opinions of medical students towards the process of problem-based learning (PBL). The method to conduct this study was cross-sectional in nature. The study was conducted at Karachi Medical and Dental College. The sample was 104 medical students of fourth-year MBBS (52 each of batch 2004 and 2005). Data was collected through a closed-ended questionnaire. Results showed that students supported problem-based learning (PBL) as an effective method of learning to become active learners with motivation towards self-directed learning. The majority of students reported that PBL builds up communication skills, interpersonal relationships, and problem-solving capacity.

Liu et al. (2006) studied the effect of computer-enhanced problem-based learning (PBL) on learning in science. This study also investigated the relationship among students' self-efficacy, attitude toward science, and achievement. The sample for this study was middle school students. Analyses of quantitative and qualitative data suggested that there was an increase in students' science achievement and self-efficacy for learning science in a PBL environment with no significant change in attitude toward science. A positive relation was found between students' attitude towards science and self-efficacy and also between self-efficacy and achievement in science but not with attitude towards science.

Sungur et al. (2006) investigated the effect of problem-based learning (PBL) on students' academic achievement and performance skills. This study was conducted with sixty-one (61), 10^{th}-grade students on the topic of the human excretory system. The same biology teacher instructed both the groups involved in this study. Pre test-post test design was used with random assignment of groups as experimental and control. Results revealed that the problem-based learning (PBL) group got significantly higher scores than the traditionally-taught group. Experimental group students were seen to be more proficient in the use and exploration of new information.

Tiwari et al. (2006) compared the effects of problem-based learning (PBL) and lecturing approaches on the development of students' critical thinking. 79 undergraduate nursing students at a university in Hong Kong, took part in this study and were randomly assigned to either PBL (n = 40) or lecturing (n = 39) over 1 academic year. Data were collected longitudinally at 4-time points spanning over 3 years. Results showed that significant differences in the development of students' critical thinking between PBL and lecture-based learning groups.

Rajab (2007) studied self-efficacy in biology and attitudes towards biology in a PBL group and a traditional lecture-based group. The study used a quasi-experimental design. Data was collected by quantitative pre-and post-surveys, qualitative interviews, and classroom observations also. Results showed that students of the PBL group gained better self-efficacy and had more favorable attitudes toward biology in comparison to students of the traditional group. The aspects of PBL that most accounted for these

findings were students' ownership of the learning process, deep understanding of the material, interactions of students in their PBL groups, and utility of PBL accounted for these findings. This suggested that PBL was useful for both high-achieving and low-achieving students.

Akınoğlu and Tandoğan(2007) examined the effect of PBL both quantitatively and qualitatively on academic achievement and concept learning in science education of 7th-grade students. The experiment was performed with Pre and post-test, treatment-control group design. Each group had N=25 students. Document analysis was employed for qualitative data. An attitude scale with achievement test and open-ended questions in science education were used as instruments to measure achievement and attitudes. Data analysis showed that the PBL model had a positive effect on students' academic achievement scores and their attitudes towards the science course along with conceptual development.

Tarhan and Acar (2007) examined the effect of PBL (Problem based learning) on students' understanding on a topic of chemistry and their social skills. The study was quasi-experimental in nature. The sample was 11th-grade students. Stratified random sampling was used to select a sample. Interviews were conducted to understand students' views about their experiences. Results revealed that PBL group students outperformed traditional group students. Interviews also revealed that students were more active in PBL settings than their counterparts in the traditional group.

Dehkordi and Heydarnejad (2008) compared the effect of Problem-based learning (PBL) and lecture-based learning on behavior, attitude, and learning of nursing students. The sample for this study was 40 2nd year nursing students (20 students in each group). The study was done for the one-semester course using the two methods. The results revealed that the knowledge level in the PBL group was significantly better than that of students in the lecture group. Also, a significant difference was found in the level of attitude toward learning between the PBL and lecture groups. So this study suggested that the PBL group with a more positive learning attitude and higher learning motivation than the lecture-based learning group.

Mantri et al. (2008) studied the effect of PBL on knowledge and skills attained by students of Analogue Electronics teaching. The design of the study was quasi-experimental in nature. The data analysis results found that PBL group students performed better in the skill as well as knowledge test than their counterparts in the traditional teaching group.

Serin (2009) studied the effect of PBL on students' science achievement, attitude towards science courses, and scientific process skills. The sample for the study was 7th-grade students. This study had one control group and two experimental groups. PBL-I and PBL- G was PBL groups with individual work and with group work respectively. Results revealed that there were no differences among groups on achievement, attitude, and process skills. But interviews with PBL students revealed that in general students were more enthusiastic in the PBL environment.

Strobel and Barneveld (2009) conducted a meta-analysis of meta-analysis studies to provide a synthesis of the effect of PBL in comparison to the traditional way of teaching. This study used the qualitative meta-analysis technique. The findings of this study revealed that PBL was a superior pedagogy to traditional pedagogy. PBL supported long-term retention of content, satisfaction among students as well as teachers.

Inel and Balim (2010) studied the effect of PBL on academic achievement in science in an experimental study having two groups experimental group (n=20) and control group (n=21) students of elementary level. The intervention was carried for four weeks. Significant differences were found in favor of the PBL group as compared to the control group in the academic achievement test scores which suggested the strengths of PBL over the traditional lecture-based method.

Reynolds and Hancock (2010) explored the differential effects of PBL and LBL (lecture-based learning) in students enrolled in environmental biotechnology undergraduate courses in which students exposed to PBL were compared to the control group (LBL). Data was collected through quizzes, scenarios, surveys, and interviews revealed that the PBL group had greater problem-solving skills, achievement, and positives attitudes toward the learning process as compared to the control group.

Bayrak and Bayram (2011) studied the effect of PBL on students' conceptual understanding of the topic of acids and bases. The study used a pretest-posttest control group design. The sample for this study was 8th-grade students. Results showed that students of the PBL group scored higher than the control group students.

Downing et al. (2011) examined the effectiveness of problem-based learning (PBL) in higher education based on a large sample of first-year undergraduates from two programs at a Hong Kong University with ample size 132. Results showed PBL group performed better and students' experiences demonstrated that the PBL group students scored significantly higher scores in their overall course satisfaction and generic skills development which showed that PBL environments foster constructivist learning and enhancing student experiences as active learners.

Maxfield (2011) examined the problem-based learning (PBL) and teacher-led instruction effects on student learning by quasi-experimental 2 by 2 factorial design on grade 5 rural middle school students for problem-solving skills, achievement, and attitude towards science. Results revealed that the use of PBL improved student achievement and attitude towards science but no significant differences were found in groups on the basis for problem-solving

Tatar and Otkay (2011) studied the effect of PBL on science teachers' understanding, their process skills, and their opinions about PBL. The study was carried out to teach the first law of thermodynamics. The sample was 48 third-grade university students from the Department of Science Education, Turkey. An experimental design with one group pretest-posttest was used. Paired t-test was used to study differences in

pre/post tests. Results showed that the PBL approach had a positive effect on the students' learning abilities and science process skills. Almost all students favored the PBL environment as supportive, effective, and nurture self-learning. On contrary, some students thought the PBL environment gave them limited time and impeded their learning.

Inman (2011) investigated the effects of PBL on growth in science process skills and math achievement by analyzing the data with a sample of high potential and high ability students in grades 3 through 6, students from low socio-economic (SES) backgrounds. The study took two years with 3 assessments (Baseline, after one year and after the second year) and having 3 treatment groups: PBL instruction in math and science in ability-grouped target classes for the whole session, for one-day-a-week and non-PBL control group in 6 elementary schools. Overall findings revealed that the use of PBL in science instruction showed significant gains in science process skills for both PBL groups when compared to the control group with a moderate effect size ($\eta 2 = .17$). The same results were in favor of PBL in mathematics as compared to the control group.

Yurick (2011) examined the effect of web anchored PBL instruction in the subject of nanotechnology (Catching the rays) on understanding science concepts, attitude, and the perception of science in society. The sample for this study was elementary students (n=46) with a period of two and a half weeks. A pre-test post-test single group design was used to conduct this study and for analyze a paired t-test was employed. Results revealed significant results for conceptual understanding of science, attitude towards science, and perception of science in society was observed which establishes the effectiveness of PBL.

Kazemi and Ghoraishi (2012) compared the effects of the PBL Approach and the traditional teaching approach on mathematics performance, attitude, and misconception. The subjects of this study were 83 students (PBL group, N=41 and control group=42) enrolled in applied mathematics in the University of Ghorveh in Western Iran. The sampling was done randomly to allocate groups. Results revealed that in the PBL group, misunderstandings and misconceptions were reduced in students as compared to the traditional approach in mathematics, but no statistically significant difference between the two groups was found.

Ferreira and Trudel (2012) studied the effect of the PBL approach on student's attitudes towards science, problem-solving skills, and perceptions of the learning environment. The sample of this study was 48 students in three regular high schools. A mixed-method approach was used to conduct this study. Results showed that the PBL approach favored a significant increase in the attitude of students towards science and problem-solving skills. Students also reported positive views about the learning in the PBL environment along with a sense of community in the classroom.

Masek (2012) compared the effects of Problem Based Learning (PBL) and Traditional learning on students' knowledge acquisitions, critical thinking ability, and intrinsic motivation. The study was conducted on 53 undergraduate students of electrical engineering course for ten weeks period. Pre-test post-test control group experimental design was used. Students' knowledge acquisition with medium effect size and students' intrinsic motivation with medium effect size (d = .68) in the PBL group was significantly higher than that of the control group. However, students' critical thinking ability in the PBL group was not significantly different from the control group.

Jerzembek and Murphy (2013) reviewed empirical studies that had investigated the impact of problem-based learning (PBL) on school-aged pupils, to answer the question that how it has been implemented and to assess PBL's effects on academic and personal development. After searching literature on PsychINFO, the British Education Index, and the Cochrane review database, 6 studies related to school-aged learners (11 to 18 years) were identified and selected for conducting a detailed narrative literature review approach. Findings revealed that PBL as a pedagogy had a positive influence on the personal and academic development of students.

Kuşdemir et al. (2013) conducted a study to examine the effect of PBL on students' achievement, attitude towards chemistry, and motivation in chemistry. The sample for this study was 10^{th}-grade students. The study was quasi-experimental in nature. The results revealed that there were differences between experimental and control groups on achievement, attitude, and motivation in chemistry in favor of the experimental group. Also, students gave positive feedback about PBL class and group work.

Tosun and Senocak (2013) studied the effects of PBL on meta-cognitive awareness and attitude towards the chemistry of teacher candidates with varied academic backgrounds. The study used a pre-post-test design. Seventy (70) first-year undergraduate students formed the sample of the study. Analysis of the results revealed that PBL is more effective in developing metacognitive awareness levels of students with weak science knowledge backgrounds as compared to those with strong science backgrounds, and the same findings came out in attitude towards chemistry of the students with weak scientific backgrounds.

De Witte and Rogge (2014) studied the effectiveness of PBL as an alternative instruction method in secondary education. The design was experimental in nature with randomization. The PBL group had 260 students and the control group had 271 students. The variables of interest were students' achievement, motivation, and class atmosphere. The results showed a non-significant effect on student achievements, motivation, and but a significant effect on the class atmosphere.

Ding et al. (2014) conducted a pooled analysis based on 15 studies to investigate an overall estimate of the effect of PBL on learning outcomes of preventive medicine. Results found that there was a significant

increase in students' scores in the theoretical examination of the PBL group than Lecture Based learning group. The pooled PBL effects were also significant for attitude towards learning, the skill of collaboration, self-directed learning, and problem-solving. Thus, PBL favored in terms of knowledge, attitude, and skills of the students than lecture-based learning.

Ghimire and Bhandary (2014) studied students' perception and preference of problem-based learning in a 6-month introductory course at the beginning of the undergraduate medical school program. A 20-item questionnaire with a four-point rating scale was administered to collect data. The questionnaire included 13-items for perception and seven for preferences with an open-ended comment section. Results: showed students' positive reaction towards problem-based learning irrespective of gender or educational background in relation to contextual learning and retention of knowledge. Students viewed PBL as it fostered generic skills (communication, group work, critical thinking, reasoning, reflective-ness, and self-directed learning).

Park and Choi (2014) compared the effect of PBL with that of traditional learning on learning attitudes, critical thinking, and problem-solving skills. Analysis of data was done by using paired t-test, t-test, and ANCOVA. Results revealed that learning attitudes and critical thinking were significantly improved in the experiment group (PBL) but problem-solving skills were not significantly different..

Wilder (2014) reviewed systematically the effectiveness of PBL in secondary education and concluded after reviewing studies that PBL positively influences student academic achievement as well as fosters the development of content knowledge, skills such as problem-solving, critical-thinking, decision-making, collaboration, and communication skills and self-directed learning. But this review also highlighted a lack of sufficient and rigorous evidence to show the superiority of PBL over the traditional approach.

Kan'an (2015) examined the effect of PBL instruction on 12^{th}-grade students' academic achievement, problem-solving skills, and Self Directed Learning (SDL) on the topic of genetics in the biology curriculum in Qatar schools. Quasi-experiment with a non-equivalent control group and pretest and post-test design was used for this study. The sample consisted of 78 students (Boys). Four classes instructed by two biology teachers were randomly assigned as experimental and control groups. Results revealed that students in PBL classes had higher mean scores on an achievement test, problem-solving skills, and self-directed learning. PBL students performed better as compared to the conventional group students in terms of academic achievement, problem-solving skills, and Self Directed Learning.

Schauber et al. (2015) in a longitudinal study with N = 1,646 participants, assessed students in a traditional and a PBL-centered curriculum which included students' perception of the learning environment, self-efficacy beliefs, positive study-related affect, social support, indicators of self-regulated learning, and academic achievement assessed through progress tests. The results of this study were two-fold. First, substantial relations of various psychosocial domains and their associations with achievement were

identified. Second, results revealed that there were no substantial differences between traditional and PBL-based curricula.

Demirel and Dagyar (2016) compared students' attitudes in PBL and traditional teaching in a meta-analysis of 47 studies. The results of the meta-analysis found that PBL has a positive but low effect on students' attitudes. So meta-analysis concluded that Problem-based learning helps students in gaining a positive attitude toward courses.

Mustaffa et al. (2016) reviewed literature related to problem-based learning in mathematics. The literature review indicated that Problem-based learning (PBL) is a student-centered approach that can stimulate students' thinking. The study investigated the implementation of PBL at the school level and the impact of learning mathematics through PBL in secondary schools. The analysis revealed that PBL gave a positive impact on secondary school students in mathematics and effectively applied it in various knowledge domains in mathematics. The study also highlighted the concerns regarding the teacher's role with the usage of ICT and the duration of PBL implementation based on the curriculum objectives, especially in algebra. The study concluded that PBL effectively enhanced students' thinking and soft skill, which stand as important requirements of the present education system in the twenty-first century.

Brice (2017) conducted a meta-analysis to find the relationship between PBL and medical students' attitudinal behavior and their academic outcomes. This study included 14 independent studies related to PBL and medical schools while excluding other educational environments other than medical schools. The duration taken for exclusion of studies was 2003–2016. Results of this meta-analysis revealed that the use of Problem-based Learning (PBL) had no statistically significant impact on academic outcomes and attitudinal behavior of medical students.

Merritt et al. (2017) conducted a systematic literature review to explore the effectiveness of problem-based and project-based learning (PBL) implemented with students in early elementary to grade 8 (ages 3–14) in mathematics and science classrooms. The inclusion criteria focused on PBL, experimental study design, level from kindergarten to grade 8, and content on mathematics or science, this review concluded that even though there is a lack of consistency among definitions of PBL, PBL as pedagogy is effective for improving students' science and mathematics academic achievement, knowledge retention, conceptual development, and attitudes.

Mundilarto and Ismoyo (2017) studied the effect of problem-based learning on students' physics achievement and critical thinking. The research design was quasi-experimental using a pretest-posttest control group design. The research was conducted at a senior high school in Indonesia. The results revealed that experimental group students perform better in achievement and critical thinking than control group students.

Widiawati et al. (2018) studied the responses of learners towards Problem Based Learning in relation to critical thinking, communicative, collaboration; and creative (4C skills) in 21st-century learning. The

design of this study was a true experiment by using a posttest-only control design. Vocational school students were selected by using a cluster random sampling technique in Surakarta, Indonesia. The result showed that Problem Based Learning group students performed better than control group students in 4C skills.

Conclusion

The above review of research conducted in PBL, recommends that PBL gives a learning environment that can enhance students' learning, their higher-order thinking skills like critical thinking, self-regulation, inquiry, and meta-cognition. In PBL, students are expected to spend the majority of their time studying on their own or with their classmates rather than under the instruction of a teacher, which means that the use of lectures must be limited and access to quality learning resources guaranteed. The benefits of PBL as an approach in imparting the students with new knowledge through creating interest and necessary skills of communication, critical thinking, and problem-solving abilities are evident in the literature. Besides this, the concept of small groups in PBL also encourages friendships among peers, between peers and tutor who can help to build an engaging and healthy academic community.PBL also gives space to group work which is very much needed to foster one of the key elements of 21st-century skills that is teamwork. Many meta-analyses have done in the field of PBL substantiate its importance in improving students' outcomes of self-study, learning interest, encouraging team spirit, problem-solving, analyzing, the scope of knowledge base, communication skills as well as expression, long-term retention, skill development, and satisfaction of students and teachers The above researches substantiate the importance of PBL as an active learning pedagogy which provides space and gives opportunities to students to develop 21st-century skills. In this way, it can be concluded that when educational experiences become more meaningful to students, then it is more likely for students to participate actively in their learning process. Students, who participate in active learning, take interest in their education and become more likely to retain the knowledge and skills they gain through PBL. The new system should be in sync with the aspirational goals of the 21st century where not only foundational skills but higher-order skills like critical thinking, problem-solving cannot be ignored. The mentioned concerns can be answered by steering the education system towards one of the active learning approaches i.e. PBL as it can help to achieve the fundamental goal of the 21st century i.e. making a child learn "how to learn?" and become critical thinkers so they can attend to the problems of the transient world we live in.