

TRENDS AND PATTERNS IN PROBLEM-BASED LEARNING RESEARCH FOR ENGLISH LANGUAGE TEACHING: BIBLIOMETRIC STUDY

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ABSTRACT

This bibliometric study aims to explore the evolving landscape of research related to problem-based learning (PBL) in English language teaching (ELT). The research design comprehensively reviews academic publications from Google Scholar databases. The data is collected through Publish or Perish, and the analysis is conducted using bibliometric techniques. The research procedure consists of systematic literature searching and data extraction, followed by rigorous data analysis using Vosviewer. The bibliometric mapping using Vosviewer indicates fluctuating development in problem-based learning in English language teaching from 2015 to 2023, supported by 994 indexed publications on Google Scholar. The 30 patterns identified in this field form five dominant clusters: curriculum, English language teaching, experience, foreign language, learner, learning English, performance, task, ability, creativity, critical thinking skill, effectiveness, influence, learning model, outcome, active learning, challenge, interest, opportunity, practice, problem-based learning, systematic review, focus, inquiry, project, technology, total, higher order thinking skill, improvement, and perception.

Keywords: Problem-based Learning, ELT, Bibliometric, Vosviewer, Publish or Perish

INTRODUCTION

Problem-based learning is an approach that centres around the learner, empowering them to engage in research, apply theoretical concepts to practical problems, and present oral and written reports. According to Reis et al. (2017), this method encourages collaboration among students, enabling them to address complex, real-world problems and develop content knowledge and critical skills such as problem-solving, reasoning, communication, and self-assessment. Watson (2001) further elaborates that students working together on authentic problems leads to the natural development of essential skills. Wood (2003) emphasizes using triggers in problem-based learning to facilitate effective learning strategies. It's important to note that problem-based learning, as described by the researchers, goes beyond mere problem-solving; instead, it utilizes cases or problems to deepen understanding and knowledge in the classroom. Problem-based learning emerges as a student-centred approach where teachers provide challenges, fostering the development of high-order thinking skills, knowledge improvement, and a deeper understanding of the subject matter during the learning process.

Weiss (2003) outlined several principles for crafting problem-based learning (PBL) problems, which involve considering students' existing knowledge, incorporating authentic issues, and fostering collaborative, lifelong, and self-directed learning. Additionally, Duch (2001) detailed a five-stage process for developing PBL problems: selecting a central idea, contextualizing it within real-world scenarios, structuring the problem to guide student research, creating a teacher's guide, and identifying student resources. According to Hung, Jonassen, and Liu (2008), PBL is an instructional approach to address learning challenges, primarily requiring students to solve problems. This instructional method exhibits various characteristics: 1) It is problem-centric, initiating learning through structured problem simulations where content and skills revolve around the issues presented. Knowledge is constructed by applying it to these situations; 2) It is student-centred, emphasizing learner engagement without being prescriptive; 3) It is self-directed, with students individually and collaboratively assuming responsibility for identifying learning issues, employing self-assessment and peer assessment, and accessing learning materials. Imposed assignments are infrequent; 4) It is self-reflective, as learners continuously monitor their comprehension and adapt learning strategies accordingly; and 5) Teachers function as facilitators, supporting and modeling reasoning processes, overseeing group dynamics, probing students' knowledge deeply, and refraining from injecting content or supplying direct answers to questions.

In PBL classrooms, teachers refrain from directly delivering content; instead, they present problems first, followed by explanations based on the course syllabus. What distinguishes PBL from other task-based methodologies is the absence of content delivery by the teacher. They initiate the learning process by introducing and briefly explaining a problem, facilitating students' engagement with the task in alignment with the syllabus. Students are then organized into groups and collaboratively assigned to undertake research tasks. These tasks often entail thoroughly exploring diverse resources, including libraries, internet sources, and books. Students may also choose to interview field experts.

Following a specified period, typically a week, the research findings are compiled and utilized to address the problem, which is usually complex, rooted in real-life scenarios, and designed to captivate students' interest in comprehending the subject matter meaningfully (Tan, 2003). Furthermore, Aguiar (2000) outlined teachers' perceived roles in PBL, including facilitating group work, serving as role models, providing feedback, imparting information, and supporting students' professional development.

Problem-based learning is a commonly employed instructional approach in English language teaching, demonstrating that students can adeptly navigate language learning without explicit instruction and exhibit strong performance. Othman and Shah (2012) found that students engaged in PBL presented their arguments with heightened criticality and supplied ample supporting material to substantiate their perspectives. Larson (2001) affirms that students in PBL classrooms can enhance their social skills by engaging in authentic language communication opportunities.

Furthermore, PBL language classes incorporate specific practices: (1) To accommodate all course modules, not every group discussion output necessitates presentation; a comprehensive written report for select modules suffices; (2) Teachers should assign additional reading materials for each problem, such as studying five distinct articles on a given topic, which students can utilize to derive solutions; (3) The use of Internet materials should be accompanied by a printed version of the site for the teacher's review, ensuring the authenticity of students' work; and (4) Recognizing the impact or role of the native language in students' discussions should be considered (Richards & Rodgers, 2001).

Much research has been conducted on problem-based learning in English language teaching. Lin (2017) tried to integrate problem-based learning (PBL) strategies into an online English reading course to assess the influence of PBL on participants' English reading comprehension (RC) and investigate their perceptions of PBL. His statistical findings indicated that the group exposed to PBL attained notably higher average English RC scores than the non-PBL group. Furthermore, survey results showed that PBL significantly positively affected participants' active learning and the integration of cognitive processes. His study also offers instructional suggestions for incorporating PBL into online English curricula.

Ali (2019) described problem-based learning in English language teaching. For example, the teacher would teach poetry. She only evaluated her students' understanding and then gave a quiz on the various forms of poetry (the traditional method). However, in PBL class, a teacher presented a theme to students and had them write a poem in a specific style, what form is most effective, and why. So, students have reasons and final products.

Tang et al. (2020) conducted research comparing an English as a foreign language (EFL) teacher's teaching methods in traditional and problem-based learning (PBL) classroom environments within a Chinese university. His findings indicated that integrating PBL strategies in the EFL classroom did not significantly change the teacher's instructional behaviours. Consequently, the intended outcome of enhancing students' opportunities to improve their expressive English language proficiency still needs to be achieved. These results highlight the importance of creating a well-designed PBL curriculum and offering professional

development opportunities for EFL teachers to implement the PBL approach in their classrooms effectively.

In (2023), Le conducted a study examining the efficacy of employing problem-based learning to instruct engineering students in communication skills in English. The research revealed that PBL proved to be a highly effective teaching methodology. It facilitated communication skills enhancement among engineering students and enabled the practical application of content knowledge from the English course. Furthermore, the investigation identified students' primary challenges in group projects. The hope is that this research can offer valuable insights for researchers and educators seeking to utilize English as an instructional medium in science-related subjects.

Mutammimah (2023) also researched to investigate the extent and depth of study born on problem-based learning in English teaching between 2013 and 2023, along with the associated issues. The researchers employed the Systematic Literature Review (SLR) method. They collected and reported the data through the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA). The results indicated a notable upswing in publications focusing on problem-based learning as a central theme, particularly in the last three years. Among the numerous publications scrutinized, the majority were quantitative research studies. College and undergraduate students were predominantly the subjects of these studies, with problem-based learning in teaching writing emerging as the most frequently explored topic. This comprehensive finding aims to unveil information about publishers, authors, research methods, issues, gaps, and innovations in problem-based learning research, providing valuable insights for future researchers.

Based on the preceding studies, the researchers aim to delineate the trends and patterns observed in problem-based learning within English language teaching, employing bibliometric analysis as a foundational approach for future investigations. In this study, data analysis utilizes the VOSviewer tool, a computer program designed to construct and examine bibliometric maps (Van Eck & Waltman, 2010). VOSviewer can encompass diverse elements, including individual journals, researchers, or publications, and can be tailored to focus on citations, bibliographic merging, co-citations, or co-author relationships. Furthermore, the tool incorporates text mining capabilities, allowing for creating and visualizing co-occurrence networks featuring significant terms derived from collections of scientific literature (Hidayati, 2023).

METHODOLOGY

This research employs the bibliometrics analysis. The data was collected by searching indexed publications in Google Scholar using the Publish or Perish application. The researchers used problem-based learning and English language teaching as the keywords. In this context, articles published in journals from 2015 to 2023 were taken. As a result, there are 994 documents.

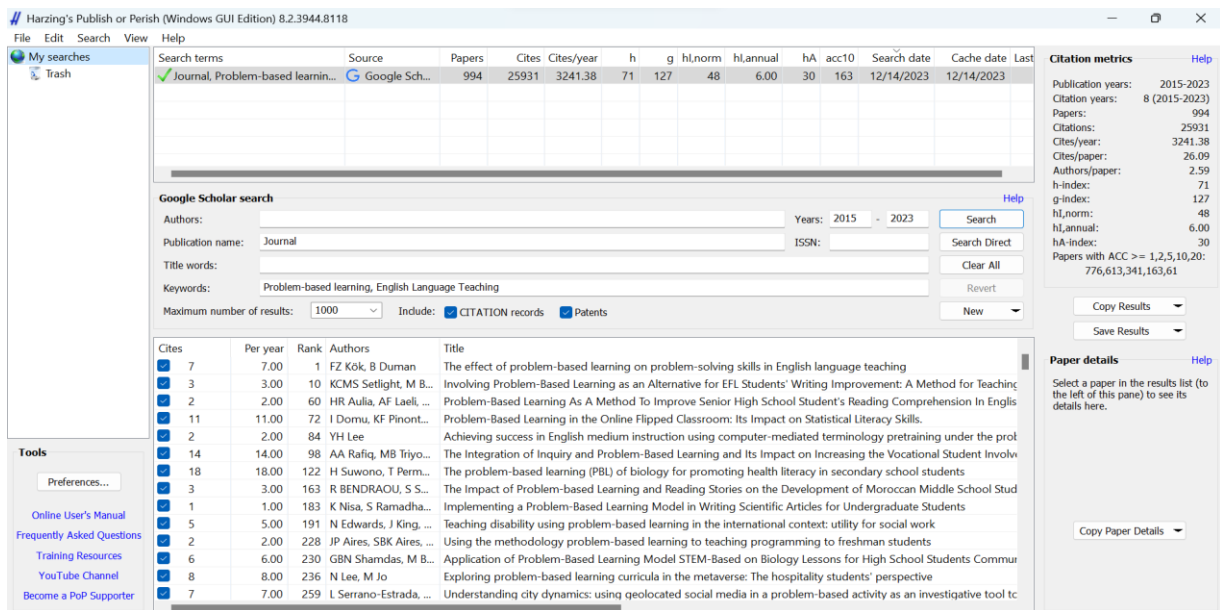


Figure 1. Searching method via Publish or Perish

After the data was obtained and stored in RIS (Research Information Systems) files, the researchers inserted the file data into the VOSviewer software to visualize the patterns.

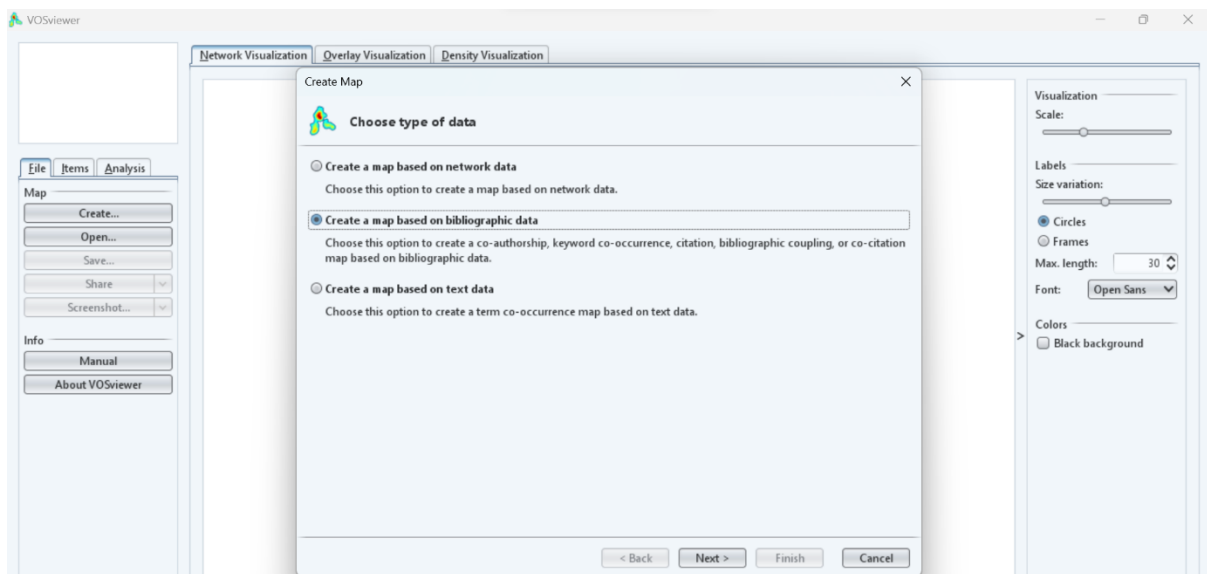


Figure 2. The process of inserting RIS data via VOSviewer

There are three inter-bibliometric relationship categories: network visualization, overlay visualization, and density visualization. Network visualization aims to visualize whether the network is vital term research. Meanwhile, overlay visualization is defined as visualizing historical traces based on the year the research was published. Then, Density visualization shows the density of the research group.

Bibliometrics is a methodology employed to introduce scientific publications, particularly those related to scientific citations, utilized in fields such as librarianship. The analysis involves exploring various aspects associated with publications on a given subject, typically presented in four subsections: general sample information, examination of journals, analysis of authors and articles, and keyword analysis (Reis et al., 2017). This research focuses on conducting a bibliometric study to analyze the trends and patterns observed in problem-based learning within the context of English language teaching.

FINDINGS AND DISCUSSION

Based on the results of a search conducted by the researchers on Google Scholar on Publish or Perish with the keywords 'Problem-based learning and English language teaching,' 994 articles ranged from 2015-2023.

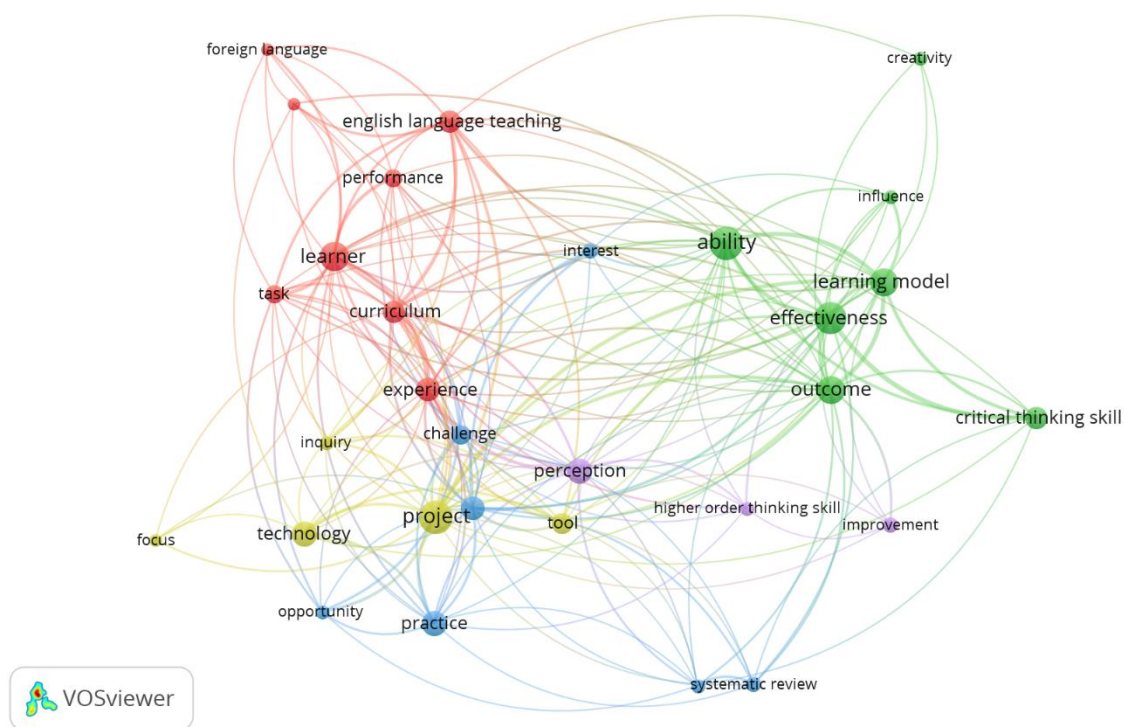


Figure 3. Network Visualization of PBL in ELT terms

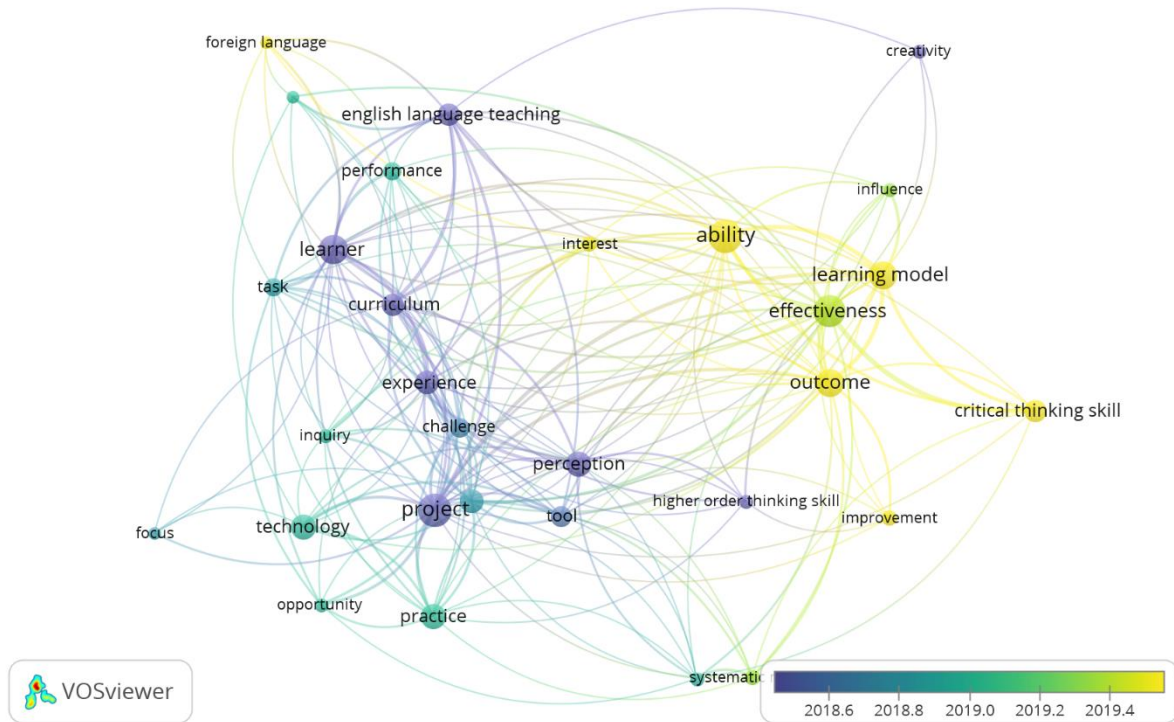


Figure 4. Overlay Visualization of PBL in ELT according to the year

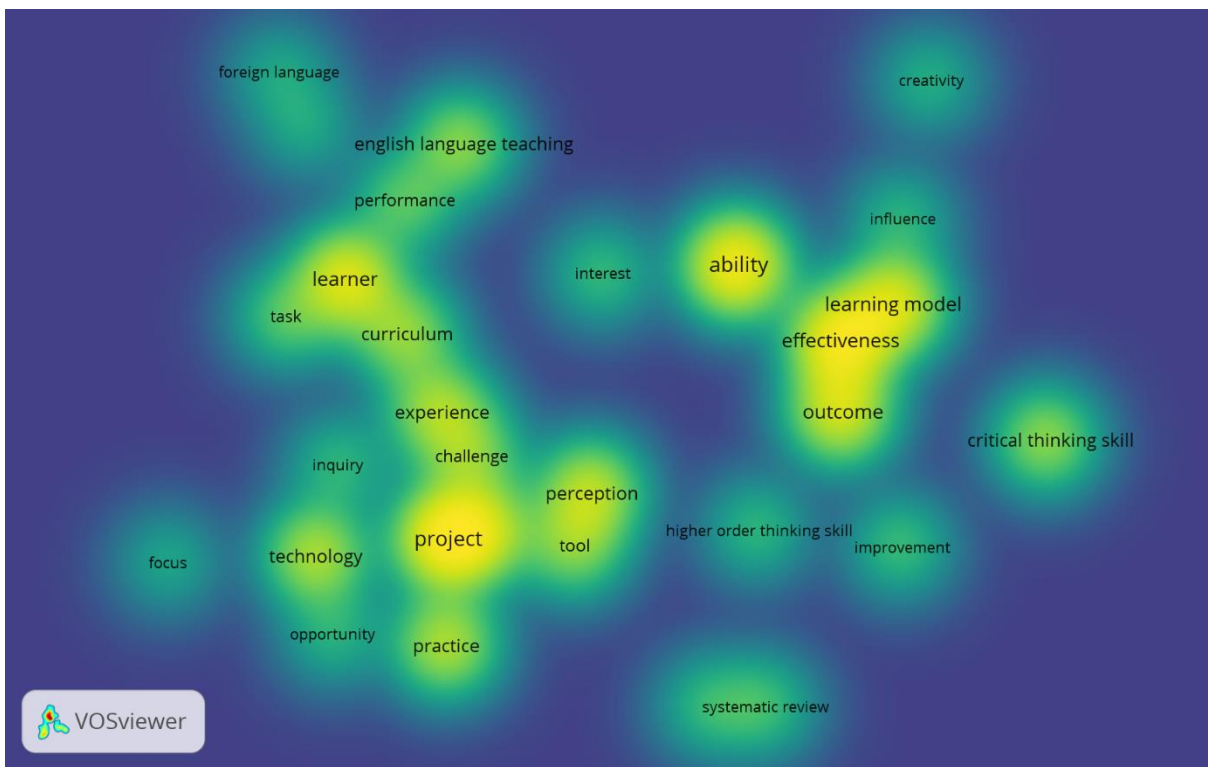


Figure 5. Density Visualization of PBL in ELT Terms

The researchers found 104 terms and patterns related to problem-based learning in English language teaching in this study. Then, they were sorted into 62 terms, which were selected as 30 terms. Currently, 30 terms are the most relatable, as displayed above, and are divided into 5 clusters. The terms in cluster 1 consisted of 8: curriculum, English language teaching, experience, foreign language, learner, learning English, performance, and task. Cluster 2 included seven terms: ability, creativity, critical thinking skill, effectiveness, influence, learning model, and outcome. Cluster 3 consisted of 7 terms: active learning, challenge, interest, opportunity, practice, problem-based learning, and systematic review. There were five terms in cluster 4: focus, inquiry, project, technology, and total. The last cluster, 5, mentioned higher-order thinking skills, improvement, and perception. It is supported by Samosir, et al., (2023), the patterns in PBL included critical thinking skill, effectiveness, and ability. In addition, the previous study showed that creativity and critical thinking are the trends for problem-based learning in 21st century skills (ÖZÇELİK & Ecem, 2023).

Furthermore, looking at the co-authorship in the Problem-based Learning in English Language Journal, several researchers intensively write on the themes related to PBL as illustrated in the visualization below:

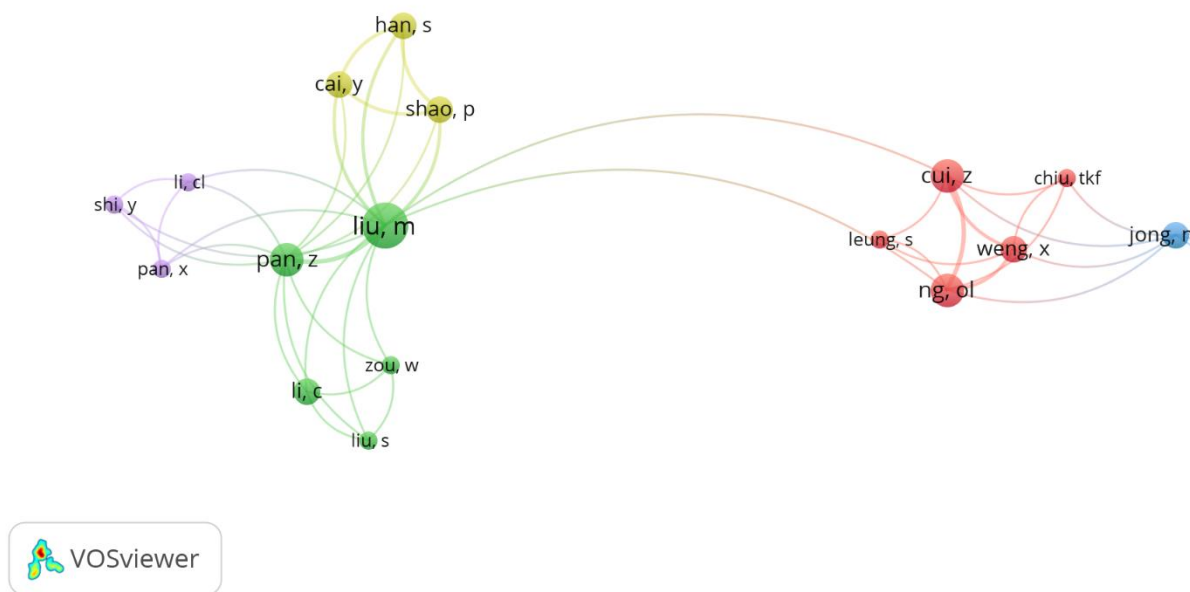


Figure 6. Network Visualization on Co-authorship Visualization on PBL in ELT Journal

Figure 6 shows network visualization on co-authorship marked by a presence node (circle) representing the authors and an edge (network) describing the relationship between authors. It is explained that there is a correlation between authors in problem-based learning in English language teaching. Bibliometric analysis based on the authors centered Weng, X and Liu, M. The author known as Liu, M connects the other authors, namely Pan, Z; Li, C; Liu, S; Zou, W; Shao, P; Han, S; Cai, Y; Li, Cl; Shi, Y, and Pan, X. In addition, Weng, X connects Cui, Z; Leung, S; Ng, Ol; Jong, M, and Chiu, TKF.

With this, the most important articles that can be used as references in the study of 'Problem-based Learning in English Language Teaching' according to the most relevant studies provided by the Publish or Perish database:

No.	Cited	Authors	Title	Journal
1.	695	B Birgili	Creative and critical thinking skills in problem-based learning environments (2015)	Journal of Gifted education and creativity
2.	440	S Dole, L Bloom, K Kowalske	Transforming pedagogy: Changing perspectives from teacher-centered to learner-centered (2016)	Interdisciplinary Journal of Problem-Based Learning
3.	287	R Phungsuk, C Viriyavejakul, T Ratanaolarn	Development of a problem-based learning model via a virtual learning environment (2017)	Kasetsart Journal of Social Sciences
4.	234	MD Saputra, S Joyoatmojo, DK Wardani, et.al	Developing critical-thinking skills through the collaboration of a jigsaw model with a problem-based learning model (2019)	International Journal of Instruction
5.	181	MA Ghufron, S Ermawati	The strengths and weaknesses of cooperative learning and problem-based learning in EFL writing class: Teachers' and students' perspectives (2018)	International Journal of Instruction
6.	124	N Nariman, J Chrispeels	PBL in the era of reform standards: Challenges and benefits perceived by teachers in one elementary school (2016)	Interdisciplinary journal of problem-based learning
7.	114	A Nurkhin, H Pramusinto	Problem-Based Learning Strategy: Its Impact on Students' Critical and Creative Thinking Skills (2020)	European Journal of Educational Research
8.	106	E Ceker, F Ozdamli	Features and Characteristics of Problem-Based Learning (2016)	Cypriot Journal of Educational Sciences
9.	104	L Widiawati, S Joyoatmojo, S Sudiyanto	Higher order thinking skills as the effect of problem-based learning in 21st-century learning (2018)	International Journal of Multicultural and Multireligious Understanding
10.	96	R Kumar, B Refaei	Problem-based learning pedagogy fosters students' critical thinking about writing (2017)	Interdisciplinary Journal of Problem-Based Learning
11.	79	CH Chen, HT Hung, HC Yeh	Virtual reality in problem-based learning contexts: Effects on the problem-solving performance, vocabulary acquisition and motivation of English language learners (2021)	Journal of Computer-Assisted Learning

12.	79	BS Palupi, S Subiyantoro	The Effectiveness of Guided Inquiry Learning (GIL) and Problem-Based Learning (PBL) for Explanatory Writing Skill (2020)	International Journal of Instruction
13.	63	LF Fin	Impacts of the Problem-Based Learning Pedagogy on English Learners' Reading Comprehension, Strategy Use, and Active Learning Attitudes (2017)	Journal of education and training studies
14.	56	A Affandi, D Sukyadi	Project-based learning and problem-based learning for EFL students' writing achievement at the tertiary level (2016)	Rangsit Journal of Educational Studies

The provided list of influential articles on Problem-Based Learning in English Language Teaching offers diverse perspectives and findings, contributing significantly to the understanding and implementation of problem-based learning (PBL) in English language education. Collectively, these articles contribute to understanding the diverse aspects of implementing PBL in English language teaching, including its impact on critical thinking, the integration of technology, and its effectiveness in different educational settings. Researchers and educators can use these references to inform their practices and guide future research in PBL in English language education.

CONCLUSION

Based on the results of bibliometric mapping using Vosviewer using network, overlay, and density visualization, problem-based learning in English language teaching experienced fluctuating development from 2015-2023. It is supported by the total indexed publications in Google Scholar, with 994 articles. The 30 patterns in problem-based learning in English language teaching are divided into five dominant clusters as follows: curriculum, English language teaching, experience, foreign language, learner, learning English, performance, task, ability, creativity, critical thinking skill, effectiveness, influence, learning model, outcome, active learning, challenge, interest, opportunity, practice, problem-based learning, systematic review, focus, inquiry, project, technology, total, higher order thinking skill, improvement, and perception.

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