

A Systematic Review on The Preservice Teachers' Psychological Competency: Research Trends and Areas of Interest

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ABSTRACT

This literature review delves into the realm of preservice teachers' psychological competency through an analysis of 191 primary studies from 2475 taken based on "preservice teachers", "psychological competency development", "teachers training programs" keywords. The distribution of these studies over the years demonstrates the evolving interest in this subject. Recent years have witnessed a surge in publications, particularly since 2021, signifying the contemporary relevance of research in this domain. The dispersion of these studies across 187 different journals underscores that research on preservice teachers' psychological competency is not confined to a single academic outlet, highlighting its importance for future researchers. Qualitative methods prominently emerge as the preferred research approach, reflecting a focus on exploring various facets of this topic. The review also identifies 187 researchers actively contributing to this field, with minimal overlap in their publications, indicating a scarcity of studies within this area. Consequently, pinpointing the most active and influential researcher remains elusive due to the infrequency of their contributions. Within the scope of pre-service teachers' psychological competency, five primary research themes have emerged: competency development, pre-service teachers' perceptions, pre-service teachers' readiness, technology-based competency and competency evaluation. These themes underscore the multifaceted nature of research in the field of Educational Psychology and highlight the areas of current focus in this dynamic domain.

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1. Introduction

The field of education has long recognized the importance of teachers' psychological competency in fostering effective teaching and promoting positive student outcomes. Preservice teachers, individuals in the process of becoming certified educators, play a pivotal role in shaping the future of education. Understanding their psychological competency is critical not only for their own professional development but also for the overall quality of the education system.

Psychological competency encompasses a range of attributes and skills that enable teachers to effectively manage classrooms, support student well-being, and adapt to the ever-evolving educational landscape. These competencies include emotional intelligence, resilience, empathy, motivation, stress management, and self-regulation. Preservice teachers' psychological competency is particularly important, as it not only affects their own teaching performance but also impacts the academic, social, and emotional growth of their students.

Over the past few decades, there has been a growing interest in exploring and enhancing the psychological competency of preservice teachers. Researchers, educators, and policymakers have recognized the need to investigate the factors that influence psychological competency in preservice teachers, develop targeted training programs, and identify the best assessment methods to measure these competencies effectively.

However, despite the increasing attention to this critical aspect of teacher development, there is a need for a comprehensive synthesis of the existing research on preservice teachers' psychological competency. A systematic review is an essential tool for addressing this gap in the literature. Such a review can provide insights into the research trends, methodologies, datasets, and conceptual frameworks that have been employed in the study of preservice teachers' psychological competency.

This systematic review will contribute to the body of knowledge by achieving the following objective to identify research trends: The review will analyze the growth of research in this area over time, pinpointing key topics, themes, and emerging areas of interest. This will help in understanding the evolving priorities in the field of preservice teacher education.

By systematically reviewing the literature, this study aims to offer a comprehensive understanding of the current state of research on preservice teachers' psychological competency. The findings will be valuable for researchers, educators, and policymakers seeking to enhance the quality of teacher education and improve the psychological competency of future educators, ultimately benefiting the educational experiences and outcomes of students.

This paper is organized as follows. In section 2, the research methodology is explained. The results and answers of research questions are presented in section 3. Finally, our work of this paper is summarized in the last section.

2. Method

A systematic approach for reviewing the literature on the preservice teachers' psychological competency is utilized to examine the current trends in its research. Systematic literature reviews (SLR) has now been a well-established review method and is defined as a process of identifying, assessing, and interpreting all available research evidence with the purpose to provide answers for specific research questions (Kitchenham and Charters, 2007). This literature review has been undertaken as a systematic literature review based on the original guidelines proposed by Kitchenham and Charters (2007).

As shown in Figure 1, SLR is performed in three stages: planning, conducting and reporting the literature review. In the first step the requirements for a systematic review are identified (Step 1). The objectives for performing the literature review were discussed in the introduction of this chapter. Then, the existing systematic reviews on preservice teachers' psychological competency are identified and reviewed. The review protocol was designed to direct the execution of the review and reduce the possibility of researcher bias (Step 2). It defined the research questions, search strategy, study selection process with inclusion and exclusion criteria, quality assessment, and finally data extraction and synthesis process. The review protocol is presented in Sections 2.2, 2.3, 2.4 and 2.5. The review protocol was developed, evaluated and iteratively improved during the conducting and reporting stage of the review.

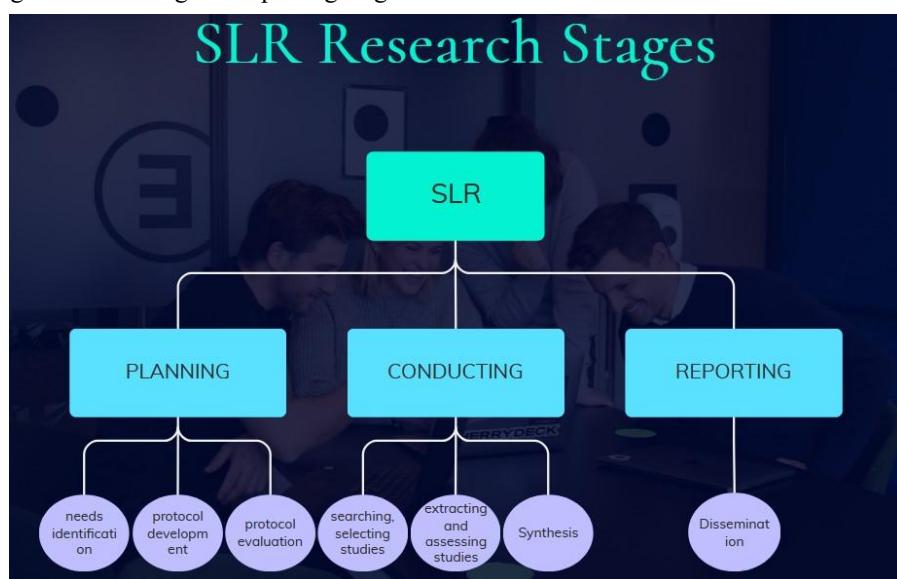


Figure 1. Systematic Literature Review Steps

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2.2 Research Questions

The research questions (RQ) were specified to keep the review focused. They were designed with the help of the Population, Intervention, Comparison, Outcomes, and Context (PICOC) criteria (Kitchenham and Charters 2007). Table 1 shows the (PICOC) structure of the research questions.

Table 1. Summary of PICOC

	Articles published within the topic of preservice teachers, psychological competency, teaching programs
Intervention	Preservice teachers' psychological competency development
Comparison	n/a
Outcomes	Data on the preservice teachers' psychological competency research trends, datasets, methods and frameworks
Context	Studies within the Higher Education teaching programs, small and large scale

Table 2. The research questions and motivation addressed by this literature review

RQ1	Which journal is the most significant among articles that published topics on preservice teachers' psychological competency development? Identify the most significant journals in the preservice teachers' psychological competency field
RQ2	Who are the most active and influential researchers in the preservice teachers' psychological competency field? Identify the most active and influential researchers who contributed so much on a research area of preservice teachers' psychological competency
RQ3	What kind of research topics are selected by researchers in the preservice teachers' psychological competency field? Identify research topics and trends in preservice teachers' psychological competency

From the primary studies, RQ1 to RQ3 give us a summary and synopsis of a particular area of research in preservice teachers' psychological competency field. Figure 2 shows the basic mind map of the systematic literature review. The main objective of this systematic literature review is to identify the preservice teachers' psychological competency research tendency as well as its areas of focus.

2.3 Search Strategy

The search process (Step 4) consists of some activities, such as selecting digital libraries, defining the search string, executing a pilot search, refining the search strings and retrieving an initial list of primary studies from digital libraries matching the search string. Before starting the search, an appropriate set of databases must be chosen to increase the probability of finding highly relevant articles. The most popular literature databases in the field are searched to have the broadest set of studies possible. A broad perspective is necessary for an extensive and broad coverage of the literature. The digital databases searched are Google scholar (scholar.google.com/), OpenAlex (openalex.org) and Crossref (crossref.org).

The search string was developed according to the following steps:

- 1) Identification of the search terms from PICOC, especially from Population and Intervention
- 2) Identification of search terms from research questions
- 3) Identification of search terms in relevant titles, abstracts and keywords
- 4) Identification of synonyms, alternative spellings and antonyms of search terms
- 5) Construction of sophisticated search string using identified search terms, Boolean ANDs and ORs

The following search string was eventually used: *(preservice teachers OR psychological OR competency) AND (student teachers* OR emotional OR literacy OR ability) AND (teaching* OR program* OR students OR mental* OR teaching* OR aptitude * OR skill*)*.

The adjustment of the search string was conducted, but the original one was kept, since the adjustment of the search string would dramatically increase the already extensive list of irrelevant studies. The search string was subsequently adjusted to suit the specific requirements of each database. The databases were searched by title, keyword and abstract. The search was limited by the year of publication: 2019-2023. Two kinds of publication namely journal papers and conference proceedings were included. The search was limited only articles published in English.

2.4 Study Selection

The inclusion and exclusion criteria were used for selecting the primary studies. These criteria are shown in

Table 3. Inclusion and Exclusion Criteria

Inclusion Criteria	Studies in academic using large and small scale data sets
	Studies discussing and comparing modeling performance in the area of preservice teachers' psychological competency.
	For studies that have both the conference and journal versions, only the journal version will be included.
	For duplicate publications of the same study, only the most complete and newest one will be included.
	Studies conducted from 2020 to 2023
	Studies use quantitative, qualitative, and mixed methos
	Studies published as journal articles and proceedings
Exclusion Criteria	Studies without a strong validation or including experimental results of preservice teachers' psychological competency.
	Studies discussing teachers' psychological competency datasets, methods, frameworks in a context other than preservice teachers' psychological competency.
	Studies not written in English

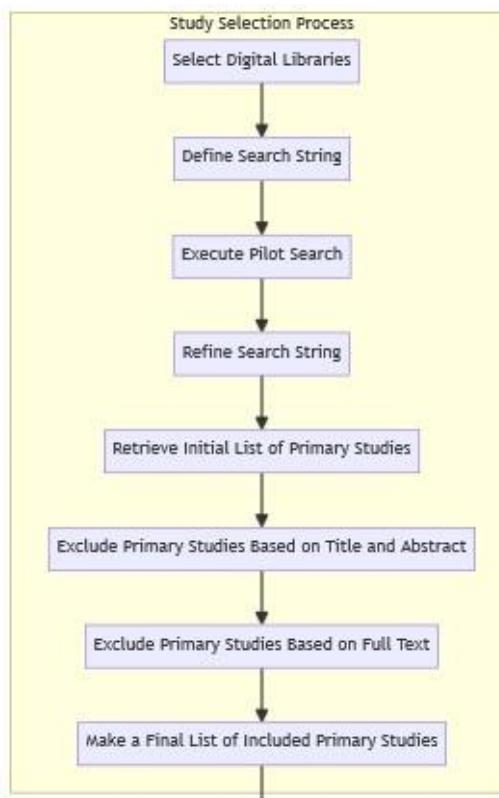


Figure 2. Study Selection Process

Software package Mendeley (<http://mendeley.com>) was used to store and manage the search results. The detailed search process and the number of studies identified at each phase are shown in Figure 2. As shown in Figure 2, the study selection process (Step 5) was conducted in two phases: the exclusion of primary studies based on the title and abstract and the exclusion of primary studies based on the full text. The literature review studies and other studies which do not include experimental results are excluded. The similarity degree of the study with preservice teachers' psychological competency is also the inclusion of studies.

The final list of selected primary studies for the first stage had 191 primary studies. Then, the full texts of 191 primary studies were analyzed. In addition to the inclusion and exclusion criteria, the quality of the primary studies, their relevance to the research questions and study similarity were considered. Similar studies by the same authors in various journals were removed. 191 primary studies remained after the exclusion of studies based on the full text selection.

2.5 Data Extraction

The selected primary studies are extracted to collect the data that contribute to addressing the research questions concerned in this review. For each of the 191 selected primary studies, the data extraction form was completed. The data extraction form was designed to collect data from the primary studies needed to answer the research questions. The properties were identified through the research questions and analysis we wished to introduce. Two properties were used to answer the research questions shown in Table 4. The data extraction is performed in an iterative manner.

Table 4. Data Extraction Properties Mapped to Research Questions

Property	Research Questions
Researchers and Publications	RQ1, RQ2
Research Trends and Topics	RQ3

Table.6 Study Quality Assessment and Data Synthesis

The study quality assessment can be used to guide the interpretation of the synthesis findings and to define the strength of the elaborated inferences. The goal of data synthesis is to aggregate evidence from the selected studies for answering the research questions. A single piece of evidence might have small evidence force, but the aggregation of many of them can make a point stronger. The data extracted in this review include both quantitative data and qualitative data. Different strategies were employed to synthesize the extracted data pertaining to different kinds of research questions. Generally, the narrative synthesis method was used. The data were tabulated in a manner consistent with the questions. Some visualization tools, including bar charts, pie charts, and tables were also used to enhance the presentation of the distribution of preservice teachers' psychological competency methods and their accuracy data.

2.7 Threats to Validity

This review aims to analyze the studies on preservice teachers' psychological competency based on statistical and machine learning techniques. This review is not aware about the existence of biases in choosing the studies. The searching was not based on manual reading of titles of all published papers in journals. This means that this review may have excluded some preservice teachers' psychological competency papers from some conference proceedings or journals. This review did not exclude studies from conference proceedings because experience reports are mostly published in conference proceedings. Therefore, a source of information about the topic is included. Some systematic literature reviews, for example (Jorgensen and Shepperd, 2007) did not use conference proceedings in their review because workload would increase significantly. A systematic literature review that included studies in conference proceedings as the primary studies is conducted by Catal and Diri (2009). As for the study, the distribution of the topics, the source of the articles, as well as the types of publications can be seen in the following graph:

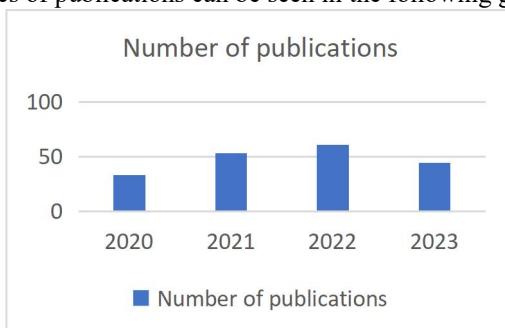


Figure 3. Number of Publication



Figure 4. Number of Articles

4. Results and Discussion

3.1 Significant Journal Publications

In this literature review, 191 primary studies that analyze the preservice teachers' psychological competency are included. The distribution over the years is presented to show how the interest in preservice teachers' psychological competency has changed over time. A short overview of the distribution studies over the years is shown in the following graph:

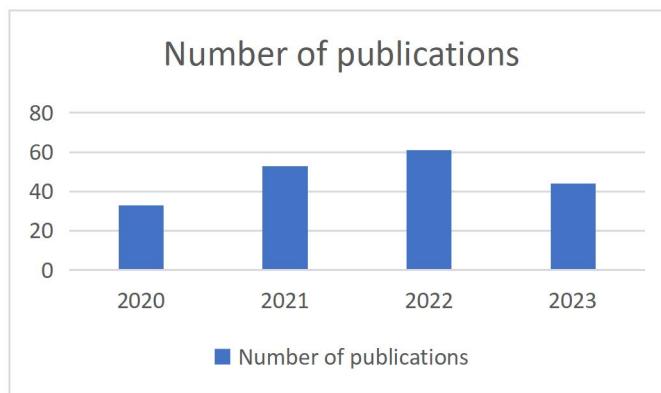


Figure 5. Number of Publication

More studies were published since 2021, indicating that more contemporary and relevant studies are included. The graph shows that the research field on preservice teachers' psychological competency is still very much relevant today. According to the selected primary studies, the answer to the most important preservice teachers' psychological competency journals is not available due to the spreadings of the study into 187 different journals, indicating that research investigating this topic is not concentrated on one specific academic outlet but rather spreaded, which would lie importance in the exploration of this area for future researchers.

In terms of the research method used to investigate the topic, it was found that qualitative method is applied the most, even before the exclusion criteria is applied. This indicates that the majority of the study are focusing on the exploration of the areas investigated.

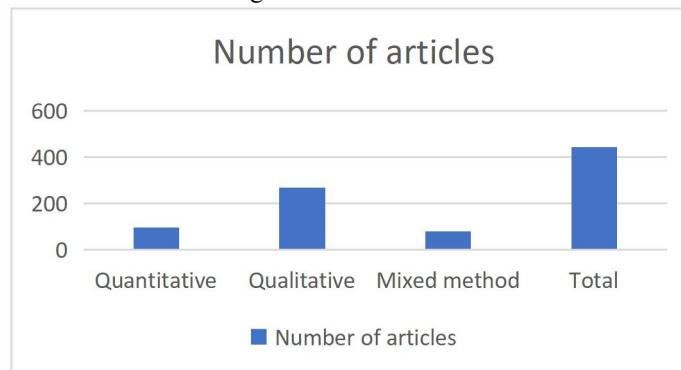


Figure 6. Number of Articles by Research Mode

3.2 Most Active and Influential Researchers

From the selected primary studies, researchers who contributed very well and who are very active in the preservice teachers' psychological competency research field were investigated and identified. There are 187 researchers who have conducted the study on the topic but their publications are not repeated within the same topic, indicating that studies on this area is rare and scarce, even for the researchers. Thus, the answer to the most active and influential researcher on this area of investigation is not available because most researchers only investigate the topic once.

3.3 Research Topics on the preservice teachers' psychological competency

Preservice teachers' psychological competency is a significant research topic in Educational Psychology. While the studies show varied and expanded, analysis of the selected primary studies revealed that current research focuses on five topics, as presented in the following categories:

- 1) **Competency development** (Cañada & Osorno, 2022; Chanda & Mafugu, 2022; DeCoito & Estaiteyeh, 2022; Herman et al., 2022; İş & Summak, 2022; Karanjakwut & Sripicharn, 2023; Kim et al., 2022; Lasekan et al., 2020; Mangkhang et al., 2021; Mirza et al., 2023; Omboto & Kanga, 2022; Ouchen et al., 2023; Pratama & Fathurrahman, 2022; Rahim et al., 2022; Rogers, 2021; Sheikh & Nor, 2022; Soqueña, 2021; Sormin et al., 2023; Szucs et al., 2020; Tiede, 2020; USLU & GÜNER, 2022; Wang & Ko, 2022; Wati, 2023; Zhumash et al., 2021).
- 2) **Preservice teachers' (PTs') perceptions** (- et al., 2023; Ağçam et al., 2021; Aghabarari & Rahimi, 2020; Asad & Javed, 2023; AYDIN, 2021; DiPaulo, 2022; Erdem & Erişti, 2022; ESPIRITU-PARRENO, 2023; Ironsi, 2021; İş & Summak, 2022; Islakhah et al., 2023; Jita & Munje, 2021; Kerkhoff et al., 2020; Koç & Yayla, 2023; Li & Jee, 2021; Mangundu, 2022; Namsaeng & Thuratham, 2023; Öntaş & Koç, 2020; Park & Yi, 2022; Phoolaikao & Sukying, 2021; Pratt, 2023; "Pre-Service Teachers' Perceptions Toward Their Pedagogical Competence," 2022; Raymond et al., 2021; Simsar & Jones, 2021; Tran, 2023; USLU & GÜNER, 2022; Webb & LoFaro, 2020; Wilcoxon & Lemke, 2021; Xu et al., 2023)
- 3) **Preservice teachers' readiness** (Aizenberg & Zilka, 2022; Chanda & Mafugu, 2022; PALOMA, 2023; Sandugash et al., 2022; Sormin et al., 2023; Wilcoxon & Lemke, 2021)
- 4) **Technology – based competency** (Ağçam et al., 2021; Alda, 2023; Alsaïd, 2021; Altınsoy, 2022; An, 2020; Awofala, 2020; Binayao & Dales, 2020; Chandrawati & Aisyah, 2022; ÇÖREKÇİ et al., 2023; da Silva Bueno & Niess, 2023; DeCoito & Estaiteyeh, 2022; Ironsi, 2021; Karanjakwut & Sripicharn, 2023; Kurnaz, 2021; Kusuma, 2022; Maipita et al., 2023; Mangundu, 2022; Namsaeng & Thuratham, 2023; Omboto & Kanga, 2022; ÖNAL & ÖNAL, 2023; PALOMA, 2023; Park & Yi, 2022; Phelps et al., 2021; Pratama & Fathurrahman, 2022; Rodrigues, 2022; Rohmah et al., 2022; Sheikh & Nor, 2022; Soqueña, 2021; Tatik & Ayçiçek, 2022; USLU & GÜNER, 2022; Webb & LoFaro, 2020; Yastibas, 2021; Zhumash et al., 2021)
- 5) **Competency evaluation** (Alrashidi, 2022; An, 2020; Camayang & Bautista, 2022; Damore & Rieckhoff, 2021; Erdem & Erişti, 2022; Herman et al., 2022; Horn et al., 2020; Ironsi, 2021; İş & Summak, 2022; Karanjakwut & Sripicharn, 2023; Kim et al., 2022; Kurnaz, 2021; Lasekan et al., 2020; Linden et al., 2022; Nemrawi & Zraiqat, 2020; Özmutlu, 2023; "Pre-Service Teachers' Perceptions Toward Their Pedagogical Competence," 2022; Rohmah et al., 2022; Yadigaroglu, 2021; Zhongbin, 2023)

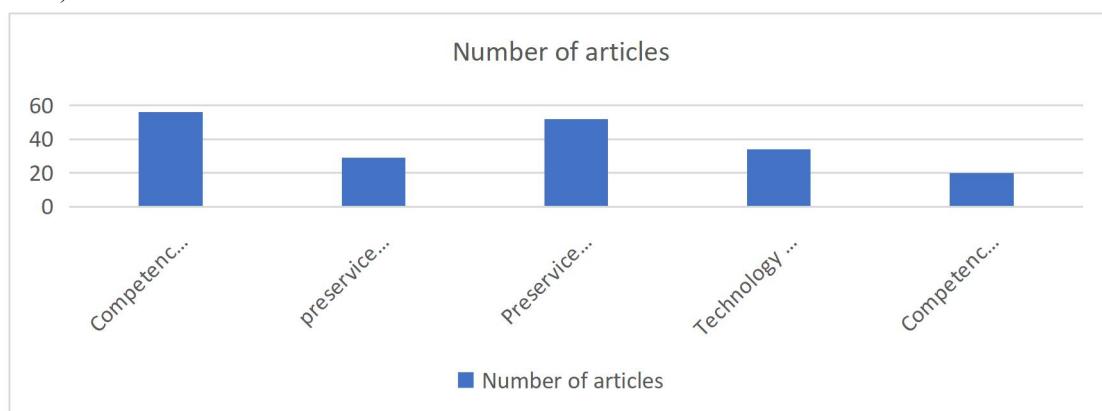


Figure 7. Number of Article

5. Conclusions

This literature review aims to identify and analyze the research inclination on the preservice teachers' psychological competency research between 2020 and 2023. Based on the designed inclusion and exclusion criteria, finally 191 studies on the preservice teachers' psychological competency published between January 2020 and December 2023 were remained and investigated. This literature review has been undertaken as a systematic literature which is defined as a process of identifying, assessing, and interpreting all available research evidence with the purpose to provide answers for specific research questions.

Analysis of the selected primary studies revealed that current the preservice teachers' psychological competency research focuses on five topics and trends: estimation, association, classification, clustering and dataset analysis. The total distribution of the studies is as follows. 77.46% of the studies search studies are related to the preservice teachers' competency development, 14.08% of the studies focused on estimation methods, and 1.41% of the studies concerned on clustering and association methods. In addition, 64.79% of the research studies used public datasets and 35.21% of the research studies used private datasets.

Three different research methods have been applied to investigate the preservice teachers' psychological competency. From the three methods, qualitative is the most applied methods in the preservice teachers' psychological competency studies, followed by mixed method and quantitative methods. The qualitative studies mostly investigate the preservice teachers' competency development, while the mixed and the quantitative methods investigate the teaching readiness, technology – based competency development, and the preservice teachers' competency evaluation.

A comprehensive evaluation of the preservice teachers' psychological competency is still an open issue in the field of Educational Psychology. More reliable research procedures need to be developed, before the confident conclusion of comparative studies can be made. This research proposes a new comparison framework for studies on the preservice psychological competency in order to fulfil the requirement for more systematic and unbiased methods. The preservice teachers' psychological competency accuracy decreases significantly because the dataset contains noisy attributes. The accuracy of the preservice teachers' psychological competency studies improved when irrelevant and redundant attributes are removed.

Finally, the list of primary studies is presented. This list is comprised of 6 attributes (year, primary studies, publications, datasets, methods, and topics) and 191 primary studies (from January 2020 to December 2023), and ordered by year of publication. Mind maps have been used to explore relationships between ideas and elements of an argument and to generate solutions to problems. It puts a new perspective on things to see all the relevant issues and analyze choices in light of the one big picture (Buzan and Griffiths 2013). It also makes it easier to logically organize information and integrate new knowledge.

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