Implementation of Technical Communication Pedagogy in Higher Education Institutions: A Systematic Literature Review

Weiqi Liu[*] , **Khairul Azhar Jamaludin** ,
Mond Isa hamzah **and Ziyun Song**
Universiti Kebangsaan Malaysia
Bangi, Malaysia

Abstract. One of the most significant needs in technical communication is to teach students how to communicate complex technical information. This paper systematically reviews the literature to map technical communication (TC) pedagogical strategies and theoretically underpinned approaches. The overall purpose is to illuminate patterns and trends in research that describe TC pedagogy, specifically learning objectives, method of delivery, content, assessment strategies, and theoretical frameworks. Following PRISMA guidelines, the study conducted detailed content analysis on 39 publications from 2017 to 2023 based on specific inclusion criteria.. Results show increasing trends in interdisciplinary, inclusive, and technology-driven approaches and recurrent themes of student-centered objectives, technology-based delivery, and diverse assessments, with Rhetorical Theory being the dominant theoretical framework in TC pedagogy research. Based on the findings, it is recommended that future research and practice in TC pedagogy prioritize the integration of comprehensive theoretical frameworks, such as social constructivism, genre theory, and rhetorical theory, to enhance the effectiveness of teaching strategies and better prepare students for the evolving demands of the modern workforce.

Keywords: Technical Communication; Pedagogy; Systematic Review; Curriculum Design; Bibliometric Analysis

1. Introduction
Due to the rapid growth of technology and the growing complexity of technical information, the field of TC has undergone significant change in recent years. TC is critical to higher education because it fills the communication gap between technical proficiency and effective communication (Jamaludin et al., 2019; Pourmand et al., 2021; Roy & Ziegler, 2019; Tham, 2023). Indeed, TC has emerged

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[*] Corresponding author: Khairul Azhar Jamaludin, *khairuljamaludin@ukm.edu.my*

as a crucial skill set, garnering attention from over a billion potential users and practitioners worldwide (Cleary, 2021; Lam & Wolfe, 2023). These skills have demonstrated their ability for teaching and learning through functions like creating documents, communicating effectively, and spreading technical knowledge (Luo et al., 2022; Tham, 2023).

TC includes a wide range of tools and platforms, ranging from conventional documentation to digital content creation and online collaboration. Most recently, studies such as those by Clark (2018) have revealed that the most popular uses of TC in education include content production and collaborative project management. The integration of TC in educational contexts has sparked a great deal of scholarly interest, with studies presenting evidence of its application for both instructional and professional development purposes (Bains, 2019; Jamaludin et al., 2019).

However, TC also poses challenges to traditional educational paradigms, necessitating a reexamination of pedagogical approaches in universities and colleges. Bay (2022) proposes TC exhibits a deficiency in diversity and inclusion within its program development, curriculum, and course options. Similarly, Pfluger et al. (2020) emphasize the importance of addressing themes like the dynamic between students and teachers, and the incorporation of TC practices into academic settings from both technical and educational perspectives. Challenges also include managing the balance between technical expertise and communication skills, adapting to new technologies, and overcoming institutional and pedagogical constraints (Rea, 2022; Wan, 2022).

Despite growing interest and empirical research on specific applications of TC (Green & Shorer, 2022), there is a dearth of systematic studies examining how scholars use TC in their teaching activities across various disciplines (AlGhamdi, 2023; Batova, 2021; Clark, 2018). Although the utilization of TC in higher education is increasingly recognized, there is still a significant amount of uncharted territory that requires further investigation to cultivate a thorough comprehension of its function as a facilitator of education and knowledge acquisition (Luo et al., 2024; Patterson, 2020; Sharma, 2022; Tham, 2023). Research has shown that teaching methods based on empirical evidence and informed by research do not fully integrate into current educational landscapes (Pourmand et al., 2021). Thus, empirical studies that draw from teaching, learning, and educational technology theories should be conducted to propel progress in this area (AlGhamdi, 2023). The development of a pedagogy for TC integration requires scholarly research that is both theoretically informed and empirically grounded, focusing on the application of existing learning theories and the role of TC in teaching and learning (Watson, 2018; Wright, 2024). In our view, the issues outlined above can be resolved by emphasizing the necessity for theoretical integration.

The purpose of the research is to carry out an in-depth and well-organized investigation of the application of TC in the pedagogic process within universities based on bibliometric methods in conjunction with content analysis from 2017 to

2023. The study clarifies and articulates the current scenario of TC and its use in educational and learning setups. The study will help in enhancing the knowledge regarding the teaching and learning process using TC in higher education through a bibliometric and qualitative analysis. To the best of our knowledge, this is the first study to address these specific objectives. To systematically explore the field of TC in higher education, the study is guided by the following concise and academically focused research questions:

1. What are the notable trends regarding the publication timeline, key journals, geographical contributions, and influential authors in TC pedagogy research?
2. Which themes, terminologies, and patterns are recurrent in terms of teaching objectives, content, method of delivery and assessment in TC pedagogy research?
3. What are the predominant theoretical frameworks or models utilized in TC pedagogy research?

2. Literature Review
2.1 Educational Value of Technical Communication in Higher Education
Technical communication relates to the higher education that is part and parcel of the need to deliver complex technical information clearly (Cleary, 2021; Lam & Biggerstaff, 2019; Roy & Ziegler, 2019; Tham et al., 2022). Discovering that TC is useful in digital documentation, multimedia content, and interactive user interface, among others (Clark, 2018). Use of TC in academic curricula will make it more student-centered regarding critical analysis, collaboration, and technical expertise by the students in use of tools (Sonka et al., 2021; Trauth, 2021).

The productive use of TC goes beyond a simple use of the tool; it resources methodologies for deep learning and understanding (Luna & Izu, 2023). Recently, researchers have posited that there are a number of evidence-based practices in the TC classroom that have to be implemented so as to provide the students with the ability to acquire the technical skill as well as build an overall understanding of how the learned skills are applied in practice (Sharma, 2022; Sloan et al., 2022).

The theories of learning which are most relevant to TC are social constructivism and connectivism. Social constructivism focuses on knowledge construction within a social setting (Dessie et al., 2022), aligning well with TC's dynamic and collaborative nature (Pourmand et al., 2021). Connectivism, prioritising learning as a process that occurs within a network, influenced by Poudel and Roy (2019), additionally promotes the integration of TC in fostering peer-to-peer communication and resource sharing (Balzotti & Hansen, 2019).

2.2 Trends and Approaches in Technical Communication Research
In the subject of TC, the potential of systematic reviews had increasingly guided educational research in TC evidenced with potential avenues for further investigation and help to merge the gap between theoretical understanding and application (Chong & Roundtree, 2021). From the reviews, it is clear that qualitative synthesis, meta-analysis as well as mixed-method approaches have found application (Melonçon et al., 2019; Poudel & Roy, 2019).

Bibliometric analyses are relatively recent in educational research and have given fresh insight into the role and trajectory of TC within education (Dharmani et al., 2021). While studies have revealed increasing interest in TC, a gap exists in the literature in that there is no exploration of an underlying theoretical framework that guides instruction in TC. This has been an attempt to fill the gap in theoretically grounded research on prevalent models and theories that inform TC pedagogy. The current paper explicates the scholarly landscape within higher education of TC, including its development, geographic spread, and its theoretical underpinnings that motivate its uptake and integration into practice.

This study examines TC in the context of higher education, with a focus on its theoretical foundation and practical applications. In recent years, a body of literature linking pedagogical theory with the use of TC has emerged. The goal of this study is to go beyond traditional literature review methodologies by using a mixed-methods approach. This approach will dissect the relationships and trends in TC research published from 2017 to 2023, providing a thorough overview of how TC has been theoretically framed and practically applied in educational settings. However, significant gaps persist, particularly in the integration of key theoretical frameworks into TC pedagogy. Many studies also fail to explore the impact of TC practices on diverse student populations and interdisciplinary applications. This review addresses these gaps by consolidating recent research to highlight trends, limitations, and areas for further investigation. Its findings aim to guide future research toward stronger theoretical foundations and inform more inclusive, technology-driven educational practices.

3. Methods
3.1 Research Design and Approach
This study employed a mixed-methods approach, combining quantitative (bibliometric analysis) and qualitative (content analysis) methodologies to effectively gather and analyze data. This dual approach was crucial for constructing a comprehensive picture of the TC pedagogy field, allowing for trend analysis within the context (Howell Smith & Shanahan Bazis, 2021) and for corroborating findings through triangulation (Farquhar et al., 2020). In interpreting subject-based text data, qualitative content analysis was very important. The systematic process of classification includes coding and identifying common themes or patterns within the data (Morgan & Nica, 2020), therefore uncovering insights into pedagogical practices and theoretical applications within the TC domain.

In other words, bibliometric analysis proves useful in giving some creative and structured way to scope the assessment of trends and the development of research in any given field through published scholarly works analysis, which previous researchers applied (Dharmani et al., 2021). The methodology made it possible to find associations within the scientific literature, whereby publications and documents were analyzed with respect to authors, journals, institutions, and countries; hence, a view at the macro-level in which the field had developed (Batista-Canino et al., 2023).

This review seeks to design a search strategy for a wide range of studies on TC pedagogy. The search string used was: ("technical communication" OR "technical and professional communication") AND ("pedagogy" OR "teach" OR "learn" OR "education" OR "skills" OR "class" OR "course" OR "instruct" OR "assess"). The same string was used in both WoS and Scopus, so it was very comprehensive in coverage.

The methodology of this investigation follows the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines developed by (Moher et al., 2010). PRISMA endorses a methodology that is transparent in its execution of systematic reviews and guarantees a repeatable process, encompassing aspects such as review protocols, search methodologies, and criteria for article selection. In outlining the criteria for including and excluding literature in the review, research that focused on TC pedagogy or curricula design was prioritized. Research that did not focus on higher education was systematically excluded. Table 1 of the paper lists these screening parameters.

Table 1: Inclusion and exclusion criteria

Inclusion criteria	Exclusion criteria
Peer-reviewed articles and conference papers (2017 – 2023)	Non-English publications
Articles discussing TC pedagogy	Articles not focusing on higher education
Articles discussing theoretical frameworks or models	Articles without a detailed description of the teaching and learning process
Research with clear study design and methodology	Studies lacking methodological quality

Initial screening (N=1253) was conducted on abstracts and titles, followed by a full-text examination to confirm eligibility. This process resulted in 1066 records. Some reasons for exclusion included: studies are without a detailed description of the teaching and learning process or not focusing on higher education. The next stage of the screening process involved reviewing the full paper and categorizing them according to its source and to identify the learning objectives, content, method of delivery and assessment strategies of TC pedagogy. This resulted in 718 records. After completing the screening process, 39 out of 718 studies were selected for content analysis, as they provided a comprehensive description of TC pedagogy and the theoretical principles upon which it is based (Figure 1).

Disagreements amongst reviewers throughout the selection process were handled by debate and consensus. Data from selected studies were extracted using a standardized form, capturing key information such as authors, publication year, study focus, methodology, and main findings. The data was then thematically analyzed to identify patterns and trends in TC pedagogical approaches. The papers were evaluated based on their methodological rigor and relevance to the research questions. This included evaluating the robustness of the study designs and the validity of their findings.
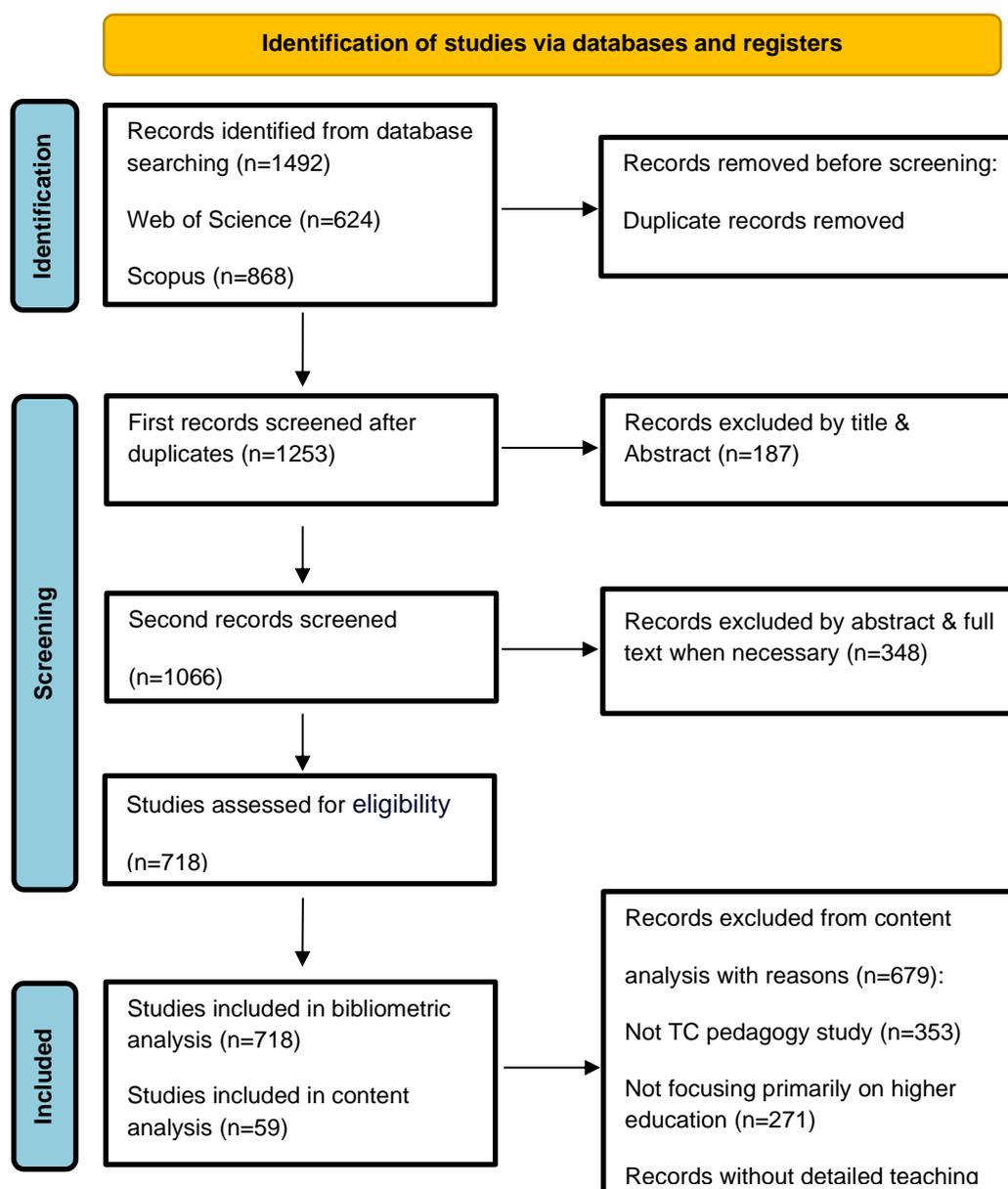
Identification of studies via databases and registers

Identification	
Records identified from database searching (n=1492) Web of Science (n=624) Scopus (n=868)	Records removed before screening: Duplicate records removed

Screening	
First records screened after duplicates (n=1253)	Records excluded by title & Abstract (n=187)
Second records screened (n=1066)	Records excluded by abstract & full text when necessary (n=348)
Studies assessed for eligibility (n=718)	

Included	
Studies included in bibliometric analysis (n=718) Studies included in content analysis (n=59)	Records excluded from content analysis with reasons (n=679): Not TC pedagogy study (n=353) Not focusing primarily on higher education (n=271) Records without detailed teaching

Figure 1: PRISMA flowchart

3.2 Procedure

Analyses began with the bibliometric analysis of the 718 articles discovered during the second screening, in an attempt to grasp the main properties of the publications (year of publication, publication venue, author, institution, country, and most common terms). A network graph among keywords used in the abstracts was visualized using VOSViewer (Eck & Waltman, 2017). VOSviewer identifies these co-occurring word clusters with the use of distance-based maps, which allow the determination of terms most used and the interrelation between them (Perez et al., 2023).

The full counting approach has been taken into consideration to present the dominant terms (Eck & Waltman, 2017). Thus, each publication has the overall weight equal to Ni (Ni being the total number of terms in the "i"-publication) and each term has a weight of 1. A term's weight is indicated by the size of the circle and its title on the map. In general, terms that have a strong relationship tend to be positioned closer together on the map. In our study, we took into account the total link strength characteristic, which shows the entire strength of a term's associations with others (Dharmani et al., 2021). Colors are used to show which cluster each term belongs to, while the relationships between words are depicted on the maps by curved lines.

Ultimately, the development of "TC pedagogy" and other significant words from abstracts were looked at and displayed using Vosviewer's overlay visualization (terms are coloured in accordance with the year of release). We employed the Viridis color scheme, which we downloaded from Matplotlib. The colors in this scheme go from blue-green to yellow by default. The 39 studies that emerged from the second screening were subjected to qualitative content analysis techniques for the study's second analytical component. Gaining a thorough knowledge of TC pedagogy and the theoretical underpinnings used in the research was one of the goals. Several categories that were modified from Manca and Ranieri (2016) served as the foundation for the content analysis.

4. Results
4.1 Notable Trends Regarding the Publication Timeline, Key Journals, Geographical Contributions, and Influential Authors in TC Pedagogy Research

For the time period under consideration, Figure 2 shows the temporal evolution of the yearly scientific output. From 2017, publications have been moving upward, with comparatively higher numbers in 2022. There is a slight decrease in 2021.
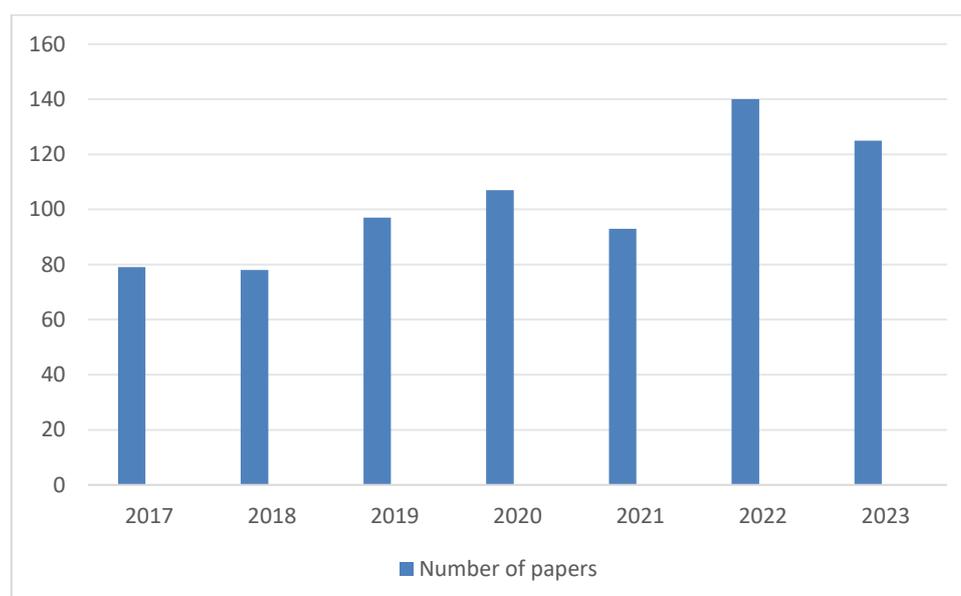

Figure 2: Number of papers on TC pedagogy (2017-2023)

Table 2 displays the number of articles by journal (conferences papers were also included). There are 6 journals with a production of 15 or more records. It was found that Technical Communication and Technical Communication Quarterly have published the most articles on TC pedagogy, with a total of 181 articles each. IEEE Transactions on Professional Communication, Journal of Business and Technical Communication and Journal of Technical Writing and Communication had 57, 55, and 48 related articles respectively.

Table 2: Popular publication venues

Journal	No. of publications
Technical Communication	98
Technical Communication Quarterly	83
IEEE Transactions on Professional Communication	57
Journal of Business and Technical Communication	55
Journal of Technical Writing and Communication	48
Business and Professional Communication Quarterly	15

Table 3 shows the scholars with the most published articles. Core authors in the subject of TC pedagogy were those who have written at least five relevant studies. The list includes nine renowned and emerging researchers from various geographical locations. As stated, six scholars are from universities in the United States, two from Malaysia, and one from Japan. The core contributors' subject fields span a wide range of topics, the bulk of which are linked to TC.

Table 3: Core authors of research on TC pedagogy

Author	Affiliation	Disciplinary area	Country	Publications
Tham	Texas Tech University	Communication	USA	8
Roy	University of Aizu	Educational Research	Japan	7
Cleary	University of Limerick	Educational Research	USA	7
Lam	University of North Texas Denton	Technical Communication	USA	6
Mackiewicz	Iowa State University	Professional Communication	USA	6
Gonzales	University of Florida	Technical Communication	USA	6
Evans	University of North Texas Denton	Technical Communication	USA	6
Alias	Universiti Malaya	Technical Communication	Malaysia	5
DeWitt	Universiti Malaya	Technical Communication	Malaysia	5

4.2 Recurrent Themes, Terminologies, and Patterns in terms of Teaching Objectives, Content, Method of Delivery and Assessment in TC Pedagogy Research

The final part of the bibliometric study looked at the most often occurring terms in abstracts to identify research trends and the most frequently used keywords (Dharmani et al., 2021). First, there was a removal of all unnecessary words, such as articles, adjectives, prepositions, conjunctions, and connectors. Second, words that appeared in abstracts less than 20 times were eliminated since they were thought to be unrelated to the research. Acronyms and synonyms were related. Ultimately, of the 16,583 terms in the abstracts, 268 terms with the greatest frequencies of occurrence were included in the study. In figures 3 and 4, the analysis of these terms is depicted through three clusters, each denoted by a distinct color. Figure 4 displays the distribution of words based on publication year. The most often occurring term in the abstracts was "student" (n=1109), followed by "technical communication" (n=544), "course" (n=526), "project" (n=385), and "practice" (n=340).

These findings suggest that the majority of the publications addressed cutting-edge TC pedagogical strategies. To be more specific, project-based learning garnered the most attention as a delivery method, and the incorporation of modern technology into TC education is another noteworthy aspect. The most common abstract term is displayed in Figure 3. It is evident that there are close ties between the high impact phrase "student" and the following: project, programme, pedagogy, TC course, technology, framework, game, and engagement. Three clusters of terms were identified by the visualization.

Each cluster was created from a set of phrases that are easily separated from one another by their placements on the map. These clusters reveal the existence of three theme threads in the literature that concentrate on:
1. student-project-collaboration-skill-curriculum-model(red);
2. covid-strategy-technology(blue);
3. professional communication-community-social justice-case study-rhetoric (green).

Examining the annual distribution of these terms (Figure 4), it is shown that research on the terms "project", "collaboration", and "teaching" was concentrated in the early years of the study. Research conducted between 2020 and 2021 often publish high impact phrases like "technology," "video," "computer," and "covid". From 2022 onwards, the studies' emphasis now centres on "social justice", "inclusion", "diversity".

Over the course of the investigation, three distinct research tendencies have emerged. From 2017 to 2019, studies mainly focused on interdisciplinary collaboration and increasing globally oriented TC programs (Gao et al., 2020). From 2020 to 2021, the evolution of TC education during this phase was marked by an increased emphasis on online teaching methods. This was a response to the challenges posed by the pandemic, where maintaining student engagement in online formats became crucial (Luna & Izu, 2023; Webb et al., 2021). During the period of 2022-2023, TC education saw a shift towards increasing inclusivity in

academic programs. This was distinguished by an emphasis on program inclusiveness and the active inclusion of many perspectives in decision-making processes and program development (Bay, 2022; Dayley, 2023; Dong & Gao, 2023; Jones, 2020)

Figure 3: Most used words found in abstracts

Figure 4: Evolution over time of terms in abstracts

4.3 Predominant Theoretical Frameworks or Models Utilized in TC Pedagogy Research

For Technical Communication Pedagogy (TCP), a complex theoretical framework is central to both the technical communicators being produced and the pedagogy itself. Only a complex framework enables the mingling of both classic and modern theories such that each is able to add its distinctive contribution to the pedagogy. Central to this integration is the Rhetorical Theory developed by modern scholars such as Kim and Olson (2020). It builds on the awareness of an audience and shows how proper rhetorical methods can be implemented to help maximize clarity and interest in TC. Complementing this is the Genre Theory, as mentioned by Jiang et al. (2022), which provides insight into the various forms of professional communication. This allows technical writers to create contextually suitable and conventionally congruent documents, which are, in turn, more potent documents for their professional communication. Dessie et al. (2022) had earlier suggested that TCP was even more enriched by a further perspective which Social Constructivism was fronted by Vygotsky. The theory promotes social engagement and teamwork as means of co-constructing knowledge. New theoretical models also include the role of peer reviews and collaborative projects in TC. Additionally, a recent addition to this theoretical tapestry is Technical Communication Pedagogy Model (TCPM), specifically catered to overcome challenges faced by TVET graduates in Malaysia (Jamaludin et al., 2020). TCPM assumes a general development in implementing TC at vocational education and is an applied approach to the mentioned theories, thus contextualizing them within specific needs of vocational education and expectations from the modern workforce.

Together, these theories and models form a comprehensive framework for TCP, with Rhetorical Theory emerging as the most recurrent and predominant framework across the 39 articles reviewed. They collectively advocate for an educational approach that balances the mechanics of writing, the understanding of genre-specific conventions, the social aspects of communication, and the practical application of these skills in professional contexts.

5. Discussion

This study maps the scholarly literature on TC pedagogy (2017‑2023). The primary goal was to capture prevalent words, research trends and study features, with an emphasis on offering an inspirational perspective on TC curriculum design. The primary outcome demonstrates an evolution from research concentrating on cross-disciplinary cooperation and boosting internationally oriented TC programs to a more recent trend from 2020 onwards, with research focusing on online methods of instruction in response to pandemic challenges and promoting inclusivity in educational programs. The subsequent chapters investigate the research's three research questions in relation to its outcomes on TC pedagogy.

5.1 Characteristics of the Scientific Literature

In general, the results demonstrate a steady rise in the amount of publications regarding TC pedagogy, with a minor fall in 2021. This pattern indicates a growing interest in the research. One of the causes of the swift rise of study in this sector might be connected to the fact that TC skill plays a crucial role as a soft skill for young engineers entering the industry (AlGhamdi, 2023; Jamaludin et al., 2019; Wan, 2022).

Technical Communication, one of the most prestigious publications on TC education and an international peer-reviewed journal, has published the most articles. The bulk of the papers are also multinational, suggesting that academic study in TC pedagogy is implemented in local, regional, or transnational learning contexts (AlGhamdi, 2023). Geographically, the findings revealed broad interest in several nations, with the US accounting for more than half of the research projects. Whilst Ding (2019) has reported that United States was definitely the most prominent nation in this sector.

5.2 Dominant Terms and Research Trends

In accordance with the phrase clusters observed from the examination of the most frequently employed phrases in abstracts, project-based learning was the most prevalent mode of delivery. And other methods of delivery like flipped classroom approach, service-learning approach, case-study approach, collaborative learning, community-engaged learning, problem-based learning and game-based learning can also be shown in figures 3 and 4.

In terms of learning objectives, the common threads running through these courses include the emphasis on developing strong oral and written communication abilities, which are essential in the technical field. Additionally, there is a focus on fostering interpersonal skills, which are crucial for effective collaboration and teamwork in professional settings. Moreover, the courses prioritize honing researching skills, enabling students to gather and analyze relevant information to support their TC efforts. A significant aspect shared among these courses is the provision of authentic work-related communicative experiences.

In terms of learning content, "Interdisciplinary" has been a key term. Sloan et al. (2022) emphasizes the paramount importance of integrating interdisciplinary content into TC education. However, the integration of social media content and social justice content into TC education is of utmost importance in the current professional landscape (Sharma, 2022).

In terms of assessment strategies, "peer assessment" and "Self-assessment" have been dominant terms. However, technology-based formative assessment and summative assessment is important in creating a transformative learning experience, Providing students with vital skills and competencies they need to excel in this dynamic field (Pourmand et al., 2021).

Three research patterns are identified over the time of investigation. From 2017 to 2019, studies mainly focused on interdisciplinary collaboration and increasing globally oriented TC programs. From 2020 to 2021, studies mainly focused on online teaching methods because of pandemic. During the period of 2022-2023, TC education saw a shift towards increasing inclusivity in academic programs.

5.3 Theoretical Foundations

Balzotti and Hansen (2019) examine Genre Theory, which focuses on understanding different types of professional communication and their conventions., focuses on understanding various professional communication forms and their conventions. According to Dessie et al. (2022), Social Constructivism emphasizes the creation of knowledge through collaboration and social interaction. Additionally, TCPM applies these principles to Malaysia's vocational education, targeting skill development, employability, and effective communication in the workplace (Jamaludin et al., 2020; Wan, 2022). Together, these theories create a well-rounded TCP approach by integrating writing mechanics, genre conventions, social collaboration, and practical professional application. Despite their importance, a significant gap exists in the integration of these theoretical frameworks into TCP research and practice, as highlighted by the literature review. Seventeen studies lack a solid theoretical basis, which limits their contributions to developing effective TC teaching strategies.

In addition to identifying key research trends and theoretical frameworks, this review has identified several recurring themes in the literature. These themes reflect the core areas where TC pedagogy is evolving and where future research may focus. One prominent theme is the shift towards technology-enhanced learning environments, where digital tools and platforms play a crucial role in fostering student engagement and collaboration. Another emerging theme is inclusive education, which emphasizes the need to adapt TC instruction to diverse student populations, ensuring equitable access to learning opportunities. The theme of interdisciplinary approaches is also gaining prominence, as TC is increasingly integrated with fields like engineering, business, and healthcare to better prepare students for multifaceted careers. These themes highlight the evolving landscape of TC education and underscore the need for curricula to adapt to the changing demands of both industry and diverse student demographics.

This study has several limitations that should be acknowledged. First, the scope of the review is limited to articles published between 2017 and 2023, which may exclude relevant older studies that could provide valuable insights. Additionally, the review focuses only on peer-reviewed English-language publications, which may overlook significant research published in other languages. Finally, while the review identifies recurring theoretical frameworks, it does not explore the depth or application of these frameworks in various cultural and educational contexts, which could be an area for future research.

6. Conclusion

This study systematically examined TC pedagogy literature in higher education from 2017 to 2023. Significant trends and insights into TC integration in education were found. Interest in TC pedagogy is growing, especially with a shift towards technology-driven and inclusive methods. Although popular strategies like project-based learning and peer assessment are useful in building practical skills and encouraging introspection among students, many studies fail to sufficiently integrate crucial theoretical frameworks such as social constructivism, genre theory, and rhetorical theory. The absence of strong theoretical underpinnings indicates a pressing need for development in this field. These findings hold key implications for higher education pedagogy. Incorporating well-established theories into TC pedagogy is critical for effective teaching strategies and preparing students for modern workforce requirements. This study's contribution is particularly valuable as it informs curriculum design and teaching practices. Educators should use technology-enhanced and inclusive teaching methods to better equip students for evolving job markets. Integrating frameworks like Rhetorical Theory, Genre Theory, and Social Constructivism can improve TC education's effectiveness. Educational policymakers and curriculum planners should advocate for initiatives that prioritize solid theoretical foundations, helping students develop practical skills and a comprehensive grasp of communication concepts. Future research efforts need to concentrate on crafting and validating thorough theoretical models for TC pedagogy. Implementing these theories in various educational contexts will lead to the creation of more inclusive and adaptable TC curricula. Examining the effects of these frameworks on student outcomes is essential for the progression of the field. Furthermore, future research should incorporate a broader array of sources, including book chapters and publications in other languages, to gain a deeper understanding of TC pedagogy.

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