ADIYAMAN UNIVERSITY

Journal of Educational Sciences

AUJES

Volume:14
Issue:1
June 2024

ADIYAMAN UNIVERSITY JOURNAL OF EDUCATIONAL SCIENCES

An international refereed e-journal and publishes two issues per year.
Year: 2024 Issue: 1

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Adıyaman University Journal of Educational Sciences (AUJES), uses double-blind review fulfilled by at least two reviewers. Referee names are kept strictly confidential.

Adıyaman University Journal of Educational Sciences (AUJES) indexed and abstracted in:
TUBITAK ULAKBIM TR Index (Social Sciences and Humanities Database), EBSCO

Table of Contents

Article History
Received: 21.12.2023
Accepted: 25.03.2024
Available online: 30.06.2024
Article Type: Research Article

ADIYAMAN UNIVERSITY
Journal of Educational Sciences
(AUJES)

https://dergipark.org.tr/tr/pub/adyuebd

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To cite this article:
Gürbüz, A., Canlı, B. & Abi, M. (2024). The opportunities and burdens of online test processes. *Adiyaman Univesity Journal of Educational Sciences, 14*(1), 1-9.

Adiyaman University Journal of Educational Sciences

Volume 14, Number 1, June 2024, Page 1-9 ISSN: 2149-2727
DOI: http://dx.doi.org/10.17984/adyuebd.1408020

The Opportunities and Burdens of Online Test Processes

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Abstract

English language testing has been challenged by the COVID-19 pandemic as it required the test developers to instantly develop and implement online language tests in their unique contexts. In this regard, this study aims to investigate EFL language test writers' reflections on their planning, development, administration, reporting, and reflection processes of a test in the emergency remote teaching environment and display the potential opportunities and burdens these processes have brought about. The data were collected by utilizing semi-structured interviews with nine test writers who had testing experience in language preparatory classes at three state universities in Turkiye. The results indicated that the test writers were mainly challenged by ensuring the security of the exams, adapting question types to online platforms, and dealing with technical problems which resulted in additional workload. However, amidst these challenges, the study also identified notable opportunities, including the practical application of exam procedures, the digital transformation of exams with a variety of resources, item banking, ecological benefits, and fostering professional development. Overall, this compulsory experience during the pandemic indicated numerous conveniences to enhance language testing and contribute to the development of robust language assessment and testing in the future.

Key words: Language testing, language assessment, remote teaching, online testing, testing processes.

Introduction

The COVID-19 pandemic crisis caused a global transition to remote teaching and learning. The education domain globally, including in Türkiye, experienced a rapid shift from face-to-face to remote teaching, learning, and assessment (Güngör & Güngör, 2021) resulting in several issues due to insufficient preparation and infrastructure problems (Şenel & Şenel, 2021). Contrary to what would have been in an educational context, the transition process to remote teaching was unplanned and rushed, leaving many institutions to implement through trial and error (Naqv & Zehra, 2020).

The transition to emergency remote teaching affected the testing processes from several aspects. The long-term effects of this will undoubtedly leave a lasting impact on classroom-based assessment. Therefore, understanding teachers' online assessment practices and the factors that influence these practices is critical not only for assessment trainers but also for language educators and policymakers in applied linguistics (Zhang, Yan, & Wang, 2021). In this respect, understanding and adapting to the challenges and opportunities posed by online testing processes in teaching English as a foreign language (EFL hereafter) can pave the way for enhanced language learning experiences and evaluation methodologies.

The integration of online testing processes in EFL has brought forth a myriad of opportunities and challenges for educators and learners alike. As technology continues to transform the landscape of education, the use of online assessments has gained momentum, presenting educators with new possibilities to enhance learning experiences. However, amidst these opportunities lie unique challenges that demand careful consideration and adaptation to ensure the efficacy and fairness of the assessment process. In this article, we delve into the various opportunities and challenges posed by online testing in the field of teaching English as a foreign language. By examining the remote testing processes and potential benefits and obstacles from the perspectives of EFL test writers, we aim to shed light on ways to maximize the potential of online testing for effective language learning and evaluation. Consequently, there is a need for a methodological approach to understanding emergency remote online teaching and learning challenges and opportunities regarding test *planning*, *development*, *administration*, *reporting*, and *reflections*. In this regard, the primary focus of the present study is to investigate:

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- the way the EFL test writers reacted to remote teaching in terms of language test development,
- the similarities or differences between online and face-to-face EFL testing processes, if any,
- the opportunities brought about and/or challenges posed by online language test development.

Review of the Literature

Principles of Language Testing

To construct an effective language test, several language assessment principles and qualities need to be followed (Bachman & Palmar, 1996; Brown, 2004). One of the essential principles of language testing is known as validity, i.e., a test should measure what the test developers intend to measure. In other words, a valid test should evaluate the program's outcomes in line with the program's objectives. For example, a language test is supposed to examine test takers' language ability. Another critical principle of language testing is described as reliability. Stoynoff and Chapelle (2005) discussed the reliability of a test "as the consistency reflected in test scores or as the absence of error in test scores." (p. 141). Reliability can also be defined as trust to inst results or consistency among characteristics of the testing situation (Bachman & Palmar, 1996). The third principle of language testing is accepted as authenticity. Bailey (1996) explained authentic test tasks are supposed to be related to real-life everyday situations. The fourth principle of language testing is acknowledged as practicality: "the adequacy of the available resources for the design, development, use, and evaluation of the test." (Stoynoff & Chapelle, 2005, p. 144). The fifth principle of language testing is identified as washback which is elucidated as the positive or negative effect of the test on stakeholders. The sixth quality of language testing is defined as interactiveness: "the expected extent of involvement of test takers' knowledge and interest and their communicative language strategies in accomplishing a test task." (Stoynoff & Chapelle, 2005, p. 143).

Test Development Processes

The test development process is regarded as a challenging task for test developers. Downing and Haladyna (2011) suggest a concise framework for test developers to facilitate test organization. The framework consists of 12 steps to develop a successful test. In this regard, Downing's systematic framework for effective test development may be useful for test developers to maximize test construction. Although all the steps are essential to a certain degree for creating effective tests, some of them may be skipped based on the test objectives. Applying these steps systematically as developing language tests may contribute to the validity, which is considered the essence of testing. Five themes emerged from this framework for the present study: planning, development, administration, reporting, and reviewing.

According to Downing and Haladyna (2011), the test planning phase commences with defining objectives, and in this pivotal stage tasks critical for a successful test are outlined. Remarkably, aligning test content with objectives ensures its success through content validity. Test specifications encompass format, item count, visuals, scoring rules, and time limits, while item selection involves choosing suitable question types based on the test's purpose. Moreover, maintaining validity in test item arrangement is essential, particularly considering the delivery mode (traditional or online). This phase concludes with careful printing and publishing, highlighting security and readability. Effective test administration necessitates standardized conditions, security protocols, and a watchful eye on cheating, particularly in online settings. Following test administration, scoring adheres to established measurement systems, requiring careful execution to preserve validity. Subsequently, essential result reports are generated for test-takers and stakeholders. A final review addresses any deficiencies, ensuring test readiness and providing recommendations for future implementations.

Opportunities Emerged from Online Testing

Although the emergent remote assessment due to the COVID-19 pandemic was a complicated and challenging issue in higher education at the same time, numerous opportunities have been reported in the related literature. The online assessment caused less anxiety among students, and the quality of the tests was considered good (Şenel & Şenel, 2021). In the same vein, Fitriyah and Jannah (2021) expressed that remote assessment strengthens flexibility regarding time and space, improves autonomous learning, cultivates preparation for online tests, and develops language assessment capacity. In addition, the online assessment was considered quite practical in delivering tests during the COVID-19 pandemic (Yulianto & Mujtahin, 2021). Moreover, the students found the remote assessment easy, enjoyable, and fun. Furthermore, thanks to remote assessment the students attained instant and direct feedback (Wibowo & Novitasari, 2021).

Kucherova and Ushakova's (2022) research demonstrates the successful application of various Moodle learning management systems online testing at the tertiary level. Students and instructors found online testing effective and relevant, with positive washback on education. The technology enables students to take the test anywhere, promoting flexibility and the comfort of their homes, and the content is not solely reliant on memory, providing a more comprehensive evaluation of students' language skills. Integrating various types of assessment

into General English courses contributed to self-driven learning and scaffolded students' learning throughout the term, while timely feedback facilitated continuous improvement. Specific technical settings, such as limited attempts and time restrictions, reduced cheating risks, making online testing a secure and valuable form of formal assessment.

Bui (2022) provides a comprehensive view of language testing and assessment in distance learning based on global and local literature. Online language testing offers numerous benefits, including promoting learner autonomy, evaluating student progress, and providing convenience. Likewise, Wibowo and Novitasari (2021) conducted a study on online assessment implementation and its impact on students' perceptions. Teachers utilized various tools such as Google Forms, Google Classroom, Quizzes, Edmodo, and Instagram for different skills like speaking, reading, and writing. The advantages of online assessment include auto-marking, immediate and quality feedback, reliable and valid measurement, efficiency, flexibility, and practicality.

Overall, the review of the literature highlights the benefits of online testing and its potential for future educational developments. Positive student perceptions highlight the benefits of well-prepared platforms, appropriate questions, clear instructions, and the flexibility of online assessments. The experiences with online testing may serve as a basis for future methodological developments, independent of lockdown restrictions, and may change the balance between online and offline formal assessment.

Challenges Posed by Online Testing

The COVID-19 pandemic has caused numerous difficulties for test developers in higher education. In their study, Guangul et al. (2020) emphasized that the COVID-19 pandemic not only influenced teaching and learning activities negatively but also affected assessment as it merged the existing problems of online assessment with the emergent COVID-19 pandemic in higher education institutions. The study reported academic misconduct, inadequate educational conditions, the amount of program output, and irresponsibility of learners in turning in homework as major challenges. In the same vein, Şenel and Şenel (2021) listed infrastructure problems and lack of online education experience for both instructors and learners as challenges the COVID-19 pandemic created for higher education institutions. Furthermore, the study revealed that ensuring fairness in test results, providing sufficient feedback, and covering the outcomes of the program was challenging.

The emergent online transformation in higher education due to the COVID-19 pandemic caused additional challenges concerning both instructors and learners in various settings. Montenegro-Rueda et al. (2021) listed instructors' shortage of education in online assessment for instructors and academic dishonesty for learners as major challenges. The study conducted by Hamad et al. (2021) also reveals significant shortcomings in online teaching across various domains. These include students' tendency to cheat during online examinations, the lack of class interactivity due to network problems, domestic distractions, and isolation, the inaccuracy of grades and results in reflecting students' true abilities, the demanding workload for instructors in planning and correcting, and difficulties in accurately assessing students' micro and macro skills as well as their motivation.

According to the research conducted by Meiantoni, Wiyaka, and Prastikawati (2021), the implementation of online assessment involves using online application-based media such as Google Classroom, Google Forms, WhatsApp groups, and Zoom Meetings for both formative and summative assessments in English classes. However, English teachers faced various challenges during the online assessment process, including unstable Internet connections for students, the need for additional time to prepare and adapt to the assessment media, varying student intelligence levels, lack of motivation and support, and limited understanding of the technology used for online assessments. Similarly, the findings of the study conducted by Kurniati and colcolleagues (2023) highlight comparable challenges faced by teachers at all levels while using online assessments, such as poor Internet connectivity, academic dishonesty, student discipline issues, and the lack of access to mobile phones.

In Wibowo and Novitasari (2021), teachers also faced challenges related to network and connection issues, designing assessments for specific skills, student control, and cheating. Nonetheless, students also expressed negative perceptions related to Internet access difficulties, distractions in noisy environments, and the time-consuming nature of online assessments. Moreover, Bui (2022) identifies several challenges, such as cheating, preference for selected response items, and concerns about validity and reliability, which increase teachers' workload. Recommendations for stakeholders, especially teachers and teacher education institutions, are presented to address these issues. Teachers are encouraged to utilize online formative assessment with prompt and personalized feedback, as well as opportunities for peer collaboration. These challenges significantly impacted the implementation of online assessments in English classes and underscored the need to address the challenges to improve the effectiveness of online teaching methods. Teacher education institutions should design training programs to enhance teachers' information and communications technology (ICT) competencies, emphasizing the effective use of technology in teaching and assessment. Additionally, flexible training methods and peer support groups are suggested to cater to teachers' diverse learning needs.

Method

Data collection

The research inquiry meticulously chose participants and the environment with careful consideration, aiming to optimize the chances of collecting extensive and valuable data from diverse viewpoints. The research encompassed the administration of semi-structured interviews with a group of nine EFL test writers who were affiliated with three state universities in Turkiye. The selection of these participant test writers was deliberate, as they were anticipated to provide valuable insights that may not have been accessible through alternative methods. As stated by Nunan (1992), the careful selection of participants based on their representativeness is essential when employing purposeful sampling techniques. Likewise, Patton (1990) characterizes purposeful sampling as a deliberate strategy that diverges from both probability sampling and convenience sampling, involving the intentional selection of specific settings, individuals, or events. Leavy (2014) emphasizes the benefits of purposeful sampling, noting that its nonprobability nature makes it particularly suitable for qualitative content analysis. This approach enables researchers to identify the most appropriate subjects for study without excluding individuals who are essential to the sample. Moreover, purposeful sampling enhances the chances of gathering in-depth, thorough, and significant data. It also provides the researcher with the flexibility to refine and adjust the sample as the study evolves, ensuring the collection of valuable information.

Participants

Participants for the study were chosen using a combination of purposive and convenience sampling methods. As the focus was on exploring the online testing practices of EFL test writers, an invitation email was expressly sent to the participants with whom one of the authors had a connection. Nine responded to the invitation and agreed to participate in the study. The participants' profiles, represented by pseudonyms, are provided in Table 1. Among the participants, six were female and three were male. While one of the participants held a doctorate, five had a master's degree and three had a bachelor's degree. The age range of the participants was between 30 and 55 years old, and their teaching experience ranged from 11 to 32 years. Their experience in testing units ranged from three to eight years.

Table 1. Profiles of the participants

Name	Gender	Age	Degree	Years of teaching	Experience in testing unit
Simon	Male	54	PhD	32	15
Kathrine	Female	52	BA	29	12
Ruth	Female	49	MA	27	6
Helen	Female	43	BA	20	8
Daphne	Female	42	MA	19	6
Celine	Female	40	BA	18	5
Henry	Male	32	MA	10	4
Nick	Male	30	MA	10	4
Julia	Female	33	MA	11	3

Data Analysis

To ensure a comprehensive and dependable comprehension of the data obtained from the semi-structured interviews, a meticulous qualitative content analysis was performed, delving into the details and nuances of the gathered information. As Weber (1990) explains, content analysis is a research methodology that employs a series of procedures to derive valid conclusions from textual data. In comparison to other research methods, content analysis presents several advantages. Firstly, it directly examines texts or transcripts, which are the outcomes of human communication and the cornerstone of social interaction. Additionally, this method is non-intrusive, preserving the integrity of the data and reducing the likelihood of participants reacting based on certain assumptions (Cohen et al., 2007; Stemler, 2001; Weber, 1990).

The coding of the raw data followed a cyclical process, which involved collaborating with a colleague and utilizing a cross-referencing approach to ensure interrater reliability at 81%. This resulted in a high level of agreement and accuracy in coding. Initially, the semi-structured interviews were recorded on video and transcribed verbatim, yielding a total of 34,790 transcribed words. Codes were then agreed upon by the researcher and the interrater, based on the dimensions of the study. Once the codes were established, both the researcher and the interrater independently organized the raw data from the interviews into themes and subthemes. At each stage of the coding process, the categorization of excerpts under relevant themes and subthemes was reviewed, revised, and ultimately finalized by referring back to the raw data. This rigorous process ensured a comprehensive understanding of the data and promoted consistency in the analysis.

Ethics Approval

The ethics application for the study was made on 13/10/2023, and the research was carried out with the approval of the Muğla Sıtkı Koçman University Ethics Commission dated 09/12/2023 and numbered 118.

Findings

The qualitative content analysis of the interviews revealed five themes regarding online testing processes namely test planning, test development, test administration, reporting test results, and reviewing test results. The frequency of subthemes that emerged from these themes is presented in Table 2. The semi-structured interviews and video-stimulated interviews were designed to elicit the EFL test writers' perceptions of the challenges and effectiveness of online testing and assessment procedures.

Table 2. The Frequency of Themes Emerged from Semi-structured Interviews

Opportunities	***f***	**Challenges**	***f***
practical and easy administration of tests	22	limited types of questions/tasks	16
online & softcopy resources	14	security issues	14
instant feedback	6	lack of feedback among test writers	10
convenient	4	technical problems	8
item banking & digital transformation of exams	4	lack of collaboration among test writers	2
statistical analysis of results	4	extra workload	2
ensuring learner privacy	4	unequal opportunities for learners	2
professional development in using technology	4	lack of assessment in speaking	2
online communication platforms	4		
ecologic benefits	2		
standardizing exam duration	2		
increasing objectivity	2		
enjoyable	2		
Total	74	Total	56

The participant test writers most frequently cited practical and easy administration of tests (22 times) as an opportunity that emerged from online testing. They found online testing more practical, especially in the planning and test administration phases as it required less workload and fewer physical requirements. Online administration of tests enabled test writers to avoid the workload of planning and preparing the physical conditions of tests. They stated that online administration of tests took the load of preparing the conditions of classrooms for exams and placing students into classrooms, printing and sorting exam papers, preparing invigilation lists and assigning instructors, dealing with planned or unplanned circumstances during the physical administration of tests, collecting exam papers at the end of the exams, and tasks alike which require physical exertion. Participant test writers also found online tests flexible and timesaving as they could be administered asynchronously, and even at the weekends without taking out from teaching time. For instance, one of the participants asserted that:

> **Julia**: *Conducting an exam* [face-to-face] *used to take one whole school day, taking 5 or 6 teaching hours. Doing this at the weekend helped save time for the flow of the syllabus.*

Another significant subtheme that emerged from the data was related to the variety of online and soft copy resources and materials used in exam content (cited 14 times). The participants emphasized that they could benefit from more online and softcopy materials rather than mainly relying on hardcopy resources as they previously did. This has also led to the digital transformation of exams and item banking (cited 4 times) in institutions. Online testing and assessment allowed test writers to diversify exam content, while also necessitating limitations on the types of tasks and questions used in exams. This was noted in the interviews 12 times. While the test writers were able to use more digital materials such as pictures, videos, MP3s, and so on in their exam content, they also felt necessary to avoid those question types that might cause vagueness and ambiguity in the proper answer which might not match the answer set into the system. They claimed that manual checks of the exam papers allowed instructors to be able to act more on their initiatives during face-to-face administration of exams; however, using an online platform for the exams took this initiative and made it necessary to avoid using open-ended and/or re-write question types and use fixed-answer question types such as matching, true-false, multiple choice and so on. The participants stated that: All tables and figures should be embedded in appropriate areas within the document and centered. They should not exceed the page margins.

***Daphne**: We do not have the flexibility in responses. We need to form fixed-answer questions like multiple-choice questions.*

***Celine**: In the face-to-face exam, we could make use of all question types such as true-false, gap-filling, sentence completion, and so on. But online testing limited the range of question types with multiple-choice questions because of the applicability. This is a significant drawback for us* [test writers].

Some further benefits of online test administration were found to be instant feedback for students (cited 6 times), statistical analysis of results (cited 4 times), and ensuring learner privacy (cited 4 times). With the use of digital tools, learners can get immediate feedback and results upon the completion of a test. These digital platforms also provide the statistical analysis of the learner results, which provides the test writers with practical feedback about the exam they have prepared and administered, and microanalysis of the exam by conducting item analysis. Test writers could easily obtain data about the difficulty of the exams, how suitably it was leveled, and implications for further exams and/or question types. It is evident that the use of online testing platforms provided educators with resourceful data. To illustrate, one of the participants uttered:

***Henry**: Online testing made it possible to obtain exam results automatically and instantly. We can also obtain statistical analysis of the results immediately after the exam.*

Regarding the opportunities that arose through online exam administration, the participant test writers further asserted that they found it more convenient (4 times) as they could work from home; they found it as an opportunity for professional development to use technology (cited 4 times) more efficiently; they had more opportunities to use online communication tools (cited 4 times) to inform the instructors about exams and receive feedback from them; and they found it more enjoyable (cited 2 twice) in practice; and online testing increased the objectivity of assessments due to the preference of fixed-answer questions, created a standardization in exam durations (cited 2 twice), and provided ecologic benefits (cited 2 twice) as they could save from paper consumption. To illustrate, the participants highlighted that:

***Ruth**: I have realized that writing can be measured with different techniques. For example, I prepared quizzes and exams for my students as if I were playing a computer game at home. In this respect, it increased my creativity in crafting exams and contributed to my professional development.*

***Simon**: Let me tell you the biggest advantage. Paper savings. We have saved toner for printing. These are financial savings. There was so much consumption that I think this was both economically and ecologically saving.*

In addition to limiting the question types, the participant test writers found online test administration challenging as they had concerns regarding security issues (14 times). No matter whether test takers are obliged to open cameras during exam administration (which was not the case for most state universities in the country), test writers felt that there was a huge gap in the security issues and that learners were taking unfair exam scores because they could cheat during the exams in any way. The test writers found this unjust and discouraging in exchange for the effort they put into the preparation of the exams. This indicates that test writers have significant concerns about the security measures taken for the administration of exams and feel unenthusiastic as a result. To illustrate, one of the participants asserted that:

***Helen**: I am not complaining about the workload, however, is it worth all this effort? In other words, when there is no security in the exam, or rather, when we are not sure about it, not only me but all our instructors and even the administration. When we are not sure about this. We try so hard, but what if students cheat or pass undeservedly? The question mark is always in our minds. I am a little upset about this.*

Another noteworthy challenge that emerged from the analysis of the data concerned the lack of feedback among test writers (cited 10 times). Test writers complained that lockdowns reduced the amount of discussion they made over the exams they were preparing, and they could merely provide distant feedback via email, and/or audio/video calls. It seems evident that the idea of distant connections with colleagues even discouraged them from debating on the exams and reduced collaboration (cited twice). The participant test writers further claimed to be concerned about technical problems (cited 8 times) that occurred during the administration of exams. These challenges mainly stemmed from the lack of efficient infrastructure, learners' Internet connection problems, learners' lack of proper devices to accomplish the exam, and so on. By the same token, institutions received complaint letters from the learners; hence, test writers were supposed to administer make-up exams for those who were unable to complete the exam due to such technical problems. As a negative consequence of online testing, test writers had to prepare additional make-up exams for unpredicted technical problems. For example, one of the participants uttered:

***Nick**: Now, students themselves may experience technical problems. They may not have Internet connection, may have problems with their computer, or their connection may be lost during the exam, and so on. Then the students are naturally given the right to take a make-up exam.*

Regarding the challenges posed by online test administration, the participants found it challenging since it brought extra workload (cited twice), created inequal distribution of opportunities (cited twice) among learners, and limited the assessment (cited twice), especially in speaking exams in terms of the evaluation of body language, mimes, gestures, and so on. They stated that online administration of exams brought about an additional step in the planning and preparation phases of exam development as it required uploading the exam content onto an online platform. This step required further caution and effort as some asserted that they had to reconstruct an examination because it was mistakenly shared with students before the due date. These were reported to be unpredicted aspects of online test administration. In a similar vein, test writers claimed that online administration of exams caused unjust circumstances among learners since they came from various socio-economic backgrounds. They believed that Internet access and devices being used were not equal among learners, which was creating disadvantaged groups.

Discussion and Conclusions

The focus of the study was to investigate how EFL test writers reacted to online testing, the potential differences in testing procedures compared to traditional testing, and the opportunities and challenges brought about by online testing. Regarding testing processes, the study revealed that online testing procedures did not significantly differ from traditional testing, with the main distinctions being in test administration and reporting results. The study highlighted that online testing offered greater convenience in test administration and result announcement. However, it also introduced additional burdens, such as the need to load and proof exam questions on online platforms. The findings further indicated that EFL test writers initially faced anxiety and uncertainty while adapting to online testing due to their lack of experience in this area. Nevertheless, they were able to overcome these apprehensions by gaining experience and exploiting incidents of professional development during the period. Despite the challenges posed by online testing, the research demonstrated that test writers were able to ultimately benefit from this demanding situation.

Surprisingly, unlike previous research on remote teaching and learning, this study revealed that the opportunities brought about by online test administration outweighed the challenges posed (Bui, 2022; Guangul et al., 2020; Hamad, et al., 2021; Kurniati et al., 2023; Meiantoni, et al., 2021; Şenel & Şenel 2021; Wibowo & Novitasari, 2021). The results indicated that EFL test writers found online testing convenient, practical, and easy to manage, which aligns with existing literature (Bui, 2022; Wibowo & Novitasari, 2021; Yulianto & Mujtahin, 2021). Similar to the emphasis on providing direct, immediate, and quality feedback in Wibowo and Novitasari (2021), and timely feedback for continuous improvement in Kucherova and Ushakova's (2022) work, online testing was found to offer instructors and learners immediate feedback and statistical data on learner performance by ensuring learner privacy, leading to positive outcomes of online testing.

A notable and distinctive finding of this study, setting it apart from previous research, revolves around the significance of the digital transformation of exams and the effective utilization of software resources. The results indicated that test writers placed significant emphasis on the use of online resources, banking the exams on digital platforms, and minimizing the use of paper and printing use, which were depicted as ecological benefits. Moreover, the study unveiled that test writers perceived online testing as a means to enhance the objectivity of tests, standardize the exam duration, enhance their technological skills, and make the testing process more enjoyable to conduct. Notably, these findings were consistent with earlier research (Şenel & Şenel, 2021; Wibowo & Novitasari, 2021).

Considering the challenges posed by online testing, the study indicated that the range and types of questions used were restricted by the online platforms employed, as suggested in Bui (2022) and Wibowo and Novitasari (2021). In contrast to the flexibility in time and place offered by online testing, it compelled the test writers to prioritize closed-ended question types and adjust the question formats they had previously used. Another major challenge posed by online testing revolves around security issues, which highlighted the EFL instructors' concerns regarding learners' tendencies to cheat and engage in academic dishonesty as previously noted by numerous scholars (Bui, 2022; Fitriyah and Jannah, 2021; Şenel & Şenel, 2021; Wibowo & Novitasari, 2021; Yulianto & Mujtahin, 2021). The results underpinned serious concerns about the accuracy of the scores obtained by learners in reflecting their actual abilities, which is leading test writers to believe that their efforts might be futile. Consistent with these findings, Yulianto and Mujtahin (2021) emphasized that online testing leads to an inaccurate assessment of learners' micro and macro skills, as well as their motivation.

Consistent with prior research (Meiantoni et al., 2021; Şenel & Şenel, 2021; Wibowo & Novitasari, 2021), another common challenge brought about by online test administration involved technical and network

problems resulting from infrastructure issues, which causes unequal opportunities for learners as the test writers highlighted in the study. In addition to the demanding workload for instructors in planning, test writers were compelled to prepare additional make-up exams for learners who lost connection or experienced technical problems during the test administration. As stated by Meiantoni et al. (2021), remote testing demanded extra time for test writers to prepare and adapt to the assessment media.

Another burden revealed in the study pertains to test writers' adaptation to online testing, although they were able to transform this challenge into an opportunity for professional development. As asserted by Meiantoni et al. (2021), the EFL test writers had a limited understanding of the technology used for online assessments due to the lack of experience in remote testing, as also observed by Montenegro-Rueda et al. (2021). A final remark of the study is that despite facilitating immediate feedback on learner performance, online test administration has led to a decrease in feedback and collaboration among test writers.

In summary, the study emphasizes that online testing, despite its challenges, offers numerous opportunities for educational institutions. The experience of the COVID-19 pandemic has underscored the need for these institutions to adapt to remote or flipped testing processes likely to be carried out in the future. To successfully achieve this, providing essential professional training for test writers and instructors, improving infrastructure, and prioritizing exam security measures are crucial steps to overcome potential challenges. By embracing these changes, educational institutions can harness the benefits and potential of online testing while effectively addressing its associated obstacles.

Recommendations

Considering the aforementioned conclusions, there are several areas for further exploration and research in the realm of online testing and its implications for educational institutions. Delving deeper into the specific strategies and methodologies for delivering professional training to test writers and instructors could yield valuable insights into enhancing the quality and reliability of online assessments. Additionally, investigating the technological aspects of infrastructure improvement, such as the development of user-friendly and secure online testing platforms, could contribute to the seamless implementation of remote or flipped testing processes. Exploring innovative approaches to exam security, including advanced authentication methods and anti-cheating measures, could further bolster the credibility and integrity of online assessments.

Furthermore, a comparative analysis of different modes of online testing, such as synchronous versus asynchronous formats, could shed light on their respective advantages and limitations. Long-term studies tracking the efficacy of educational institutions' adaptations to remote testing in the post-pandemic era could provide valuable data on the sustained benefits and challenges of these approaches. Lastly, examining the perspectives and experiences of both educators and students in these evolving contexts could offer a comprehensive understanding of the multifaceted dynamics involved in the transition to online testing.

Acknowledgments or Notes

We would like to express our heartfelt gratitude to Prof. Dr. Emrah Cinkara, whose invaluable insights and guidance have played a pivotal role in inspiring and shaping the research design for the study. His expertise and dedication have been instrumental in guiding our exploration of this important topic. We are deeply appreciative of his support and mentorship throughout this research endeavor.

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Article History
Received: 06.04.2024
Accepted: 05.06.2024
Available online: 30.06.2024
Article Type: Research Article

ADIYAMAN UNIVERSITY
Journal of Educational Sciences
(AUJES)

https://dergipark.org.tr/tr/pub/adyuebd

Organizational Identification in Diverse Groups of Teachers

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To cite this article:
Özsarı, Ö. & Kara, E. (2024). Organizational identification in diverse groups of teachers. *Adiyaman Univesity Journal of Educational Sciences, 14*(1), 10-20.

Adiyaman University Journal of Educational Sciences

Volume 14, Number 1, June 2024, Page 10-20 ISSN: 2149-2727
DOI: http://dx.doi.org/10.17984/adyuebd.1466275

Organizational Identification in Diverse Groups of Teachers

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Abstract

The aim of this study is to address the organizational identification of vocational and culture course teachers working in vocational high schools and to determine the degree to which they fit with organizational identification models. The research was designed in phenomenology design. The research group consisted of 6 culture course and 6 vocational course teachers working in a public vocational high school in Giresun Province. The participants were selected from the school where the researcher worked on the basis of volunteerism by using the convenience sampling method. In this study, two separate focus group interviews were conducted to determine teachers' views on organizational identification, and the collected data were analyzed in the MAXQDA data analysis program, and the results were interpreted. As a result, it was determined that all teachers were identified with their schools in general, but vocational course teachers were more likely to identify with the institution for which they worked than were culture course teachers. While it was common among the cultural course teachers that they could object to assigned tasks, if necessary, all the vocational course teachers indicated that they could participate in assigned tasks voluntarily and showed that they identified more with their organizations.

Key words: Organizational identification, Vocational high school, Vocational course teacher, Culture course teacher

Introduction

Like in any other social setting, people in organizations need to be quite clear about who they are as individuals and how they fit into their environment. This necessity brings along a deeper look into the working environment, organizational culture and employees' positioning within work settings. This is because identity construction regarding professional roles can be embedded in the perception of this positioning. As Gunbey & Karakutuk (in press) proposed, identity construction combines experiences with environments. Batool, Ibrahim & Adeel (2024) stress that organizational culture positively moderates the creative sharing of ideas and responsible leadership, which develops a sense of belonging and being valued. Similarly, Agyeiwaah, Bangwayo-Skeete & Opoku (2024) developed a model that explains how migrant workers' inclusion affects their identity, organizational behaviors, and well-being according to social exchange theory. The authors make a point by providing theoretical and practical perspectives on integrating migrant workers and including newcomers to foster organizational identification (OI). As Ashforth (2016, p. 362) formerly proposed, OI can be defined as a "fundamental binding of self-definition with the collective". OI goes beyond positive attitudes and being friendly. It acknowledges individuals as active agents who can influence their surroundings and ultimately their overall identity. Therefore, OI can be recognized as a way to provide new insights and suggestions for fostering a sense of community and building a sense of belongingness inside organizations.

The views of employees about unity or belonging to an organization are referred to as OI. Ashforth & Mael (1989) first coined the term as a definition of an individual in terms of the organizations in which he or she works. The term was developed from social identity theory (Tajfel, 1982), which contends that people simplify and make sense of a complicated social environment by classifying themselves and other people as members of specific groups. It also includes the psychological ties that workers have to the company they work for (O'Reilly, 1989). The acquisition of professional identity in organizations can be connected to relations with other groups within the organizations, particularly in workplaces embracing diverse groups. Zhongnan (2024) suggested that there are three ways to foster OI within diverse groups. First, according to Tyler's (1999) social identity approach, a supportive workgroup diversity environment can increase employees' OI by strengthening the organization's image and identity. This is because a well-known and appealing organization can increase workers' self-esteem by being a part of it. Second, theories of intergroup relations highlight the positive

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relationship between a person's social acceptance and relational value within a group and the fulfillment of their self-esteem (Leary & Downs, 1995). This is because self-esteem is a primary motivator for people to construct their social identities in relation to their group membership (Tyler & Blader, 2003). According to research by Jones and Volpe (2011), an individual's OI is significantly predicted by the size and quality of his or her social network within the organization. Social exchange theory serves as the last theoretical framework to explain the connection between the atmosphere of diversity in the workplace and each employee's sense of organizational identity. Employees' trust in the organizational setting and their characteristics make OI important for organizations with diverse groups. Conversely, it requires some leadership skills to make employees feel valued, and their need for belonging is met. Employees who identify with their organizations contribute to productivity by increasing their personal responsibility in the long term (Polat, 2009, p.1591), and the identified members of the organization form a whole with the values of the organization. In today's rapidly changing business world, organizations attach more importance to OI, known as 'we-ness', to retain their employees (Özcan, 2012:26). An important factor in creating a positive school climate in educational institutions is the strong OI of all stakeholders, especially students, teachers, parents and school administrators (Cilasun, 2020). In this context, the stronger the identification with the organization is, the easier it will be for the educational organization to achieve its objectives.

By examining the curricula of vocational and technical high schools, we have seen diversity in the structure of the programs, as the content is divided into two categories: vocational and culture courses. The objective of vocational courses is to teach students the technical theoretical knowledge, skills and habits required by the profession in appropriate educational environments within the school, in relevant workshops and laboratories according to the rules defined by the Ministry of National Education (MoNE) (MEB, 2008). On the other hand, culture courses provide education in different fields (branches) (Turkish Language and Literature, History, Geography, Mathematics, Physics, Chemistry, Biology, Foreign Language, etc.). Hence, there is a diverse group of teachers that are vocation focused and culture focused. Ozdemir (2012) states that there is a common perception regarding the value given to some courses. Vocational courses seem to be more important and are valued more among students. However, the opposite is true for culture courses as students already have little interest in achieving academic goals. In addition, school management vaguely supports the imbalance by increasing the number of time slots for vocational courses and decreasing them for cultural classes. This results in both failing to give students a set of cognitive and affective values and knowledge with a consciousness of a shared culture and values (Taskin & Bozkurt, 2023) and creating disparities in the OI of teachers at the same school. Such disparities in the organizational environment are proven by Tutar, Ozturk Baspinar & Guler (2021) to possibly cause psychological and physical health problems for employees in addition to reducing job satisfaction and damage to work peace.

As Kreiner and Asforth (2003) noted, OI might have implications at the individual, group and organizational levels. In addition, all three levels are interrelated in explaining meaning, belonging and control (Ashforth, 2001) in the workplace. However, another perspective is needed to specify the degree of identification as each dimension covers a different type of identification. A person who is defined as overidentified might lose his or her sense of self and be entirely absorbed into work and may not be willing to see the shortcomings of the organization, and the opposite is also possible. Kreiner & Ashforth's (2004) work to define an expanded model of identification, including identification, disidentification, ambivalent identification, and neutral identification, is an answer to the following questions: In what ways may an individual perceive themselves as in opposition to or different from the organization? What if an individual identified as both a part of and apart from the organization? And how would this impact the individual and the organization? While identification occurs when an employee defines themselves as having the same moral values, objectives and principles defined by their workplaces, disidentification occurs when individuals do not share the same attributes or principles as their organizations. Employees of an organization who identify themselves as ambivalent tend to spend important mental and emotional resources which could be used for activities that would benefit the organization. Besides, ambivalent workers are not willing to go above and beyond the call of duty when performing their jobs. This conflicting message can lead to feelings of hypocrisy, tension, and pressure to fit in (Meyerson & Scully, 1995). Finally, neutral identification is defined as a cognitive state and form of self-definition in and of itself. Elsbach (1999) defined it just the absence of perceptions and connection. People may also purposefully steer clear of strong attachments, whether positive or negative due to management philosophies (such as "I do not take sides; I just do my job"), self-descriptions (such as "I'm a loner," "I'm my own person"), or prior experiences with organizations ("once bitten, twice shy"). Therefore, for certain people, the real lack of organizational identity and disidentification can be self-defining.

Even though there are studies covering identity and OI (Brown, 2017); creative idea sharing and its relationship with OI (Batool, Ibrahim & Adeel, 2024); the moderating role of OI in organizations (Mishra, Sharma & Uppal, 2024); its relationship with psychology capital (Gunes & Bulut, 2024); and the impact of OI on job satisfaction and time management, there has been no study regarding the OI perception of vocational

school teachers. First, we aim to address this lacuna by presenting an early attempt to investigate what teachers teaching vocational courses think about OI. Second, we aim to explore the views of culture course teachers toward OI via two different focus groups. As this kind of diversity has not been studied previously, we believe that this study will contribute to the literature on OI by answering the following questions:

a. What does it mean for vocational and culture course teachers to work in a vocational high school in terms of OI?

b. Do the views of vocational course and culture course teachers working in vocational high schools on OI comply with organizational identification models?

c. What are the opinions of vocational course and culture course teachers working in vocational high schools about the image of their schools?

Method

This paper takes a phenomenological approach, as we believe that perception, beyond the dualism of body and soul, gives the cohesive perspective to the current existence Merleau-Ponty (1968) of OI. We also crosschecked Creswell's steps (2013, p. 81) with a phenomenological study and agreed that the OI phenomenon could be best elicited via the perceptions of teachers employed in the same school, where the researcher is one of 'them'. The first author ticked the second step suggested by Creswell by determining the diversity perceived among the teachers of the same school; therefore, the phenomenon defined by the authors is OI. Keeping her own experiences in parenthesis, the researcher formed two different focus groups for the best description of the perception of OI.

Study Group

The study group consisted of 6 vocational course teachers and 6 culture course teachers working in a public vocational high school in Giresun province. The participants were selected from the school where the researcher worked on the basis of volunteerism by using the easily accessible sampling method. The culture course teachers in the study group who participated in the research were coded as "P1, P2..., P4", and the vocational course teachers were coded as "V1, V2..., V5". Information about the study group profile is given in Table 1.

Table 1. Demographic properties of the participants

Participant	Branch	Seniority	Time Spent at School (Year)	Participant	Branch	Seniority	Time Spent at School (Year)
P1	Physics	20	5	V1	Child Development & Education	17	12
P2	Maths	13	11	V2	Installation Technology & Air Conditioning	25	20
P3	History	17	1	V3	Installation Technology & Air Conditioning	9	3
P4	Psychological Counseling & Guidance	16	11	V4	Information Technology	16	12
P5	Literature	20	2	V5	Information Technology	18	3
P6	Maths	4	6 Months	V6	Child Development & Education	22	12

In this study, focus group interview questions prepared by the researcher were used as a data collection tool. Of the teachers who participated in the interviews, 6 were culture course teachers and 6 were vocational course teachers. The occupational experience of the teachers who participated in the interviews ranged between 4 and 25 years. The questions were prepared at the end of a literature review to understand the participants' perceptions of OI and to determine the participants' degree of identification with their schools and the image of the school. In focus group interviews, 10–12 people (Kara & Karadeniz Özbek, 2021) with the same demographic characteristics (age, socioeconomic level, occupation, etc.) usually come together with a moderator and the research topic is discussed in a group environment. Focus group interviews provide important clues to researchers in terms of understanding the dynamic relationships among people's behaviors, ideas, motivations, interests, and problems related to their actions (Aksit, 1992).

Validity and reliability

With respect to the data collection tool, 10 questions were initially prepared by the researcher and were evaluated by five experts, after which the questions were finalized. As a result of the expert evaluation, it was decided to determine seven questions. To ensure that the focus group interviews yielded results consistent with the literature, a pilot study was conducted with two teachers to check the validity of the questions. The two teachers in the pilot study did not participate in the focus group interviews.

Validity occurs when the phenomenon being studied by the researcher is observed as it exists without bias. In qualitative research, the consistency of the research process and results is important for validity (Yıldırım & Şimşek, 2005). To ensure the validity of this study, the literature on the topic was reviewed, and the questions for the focus group interviews were prepared accordingly. Additionally, statements obtained from the opinions of the educators were supported by direct quotations.

The replicability of research findings is expressed in terms of reliability (Baltacı, 2019). To ensure reliability in this study, audio recordings were made during the interviews and the audio recordings were kept after the interviews. The teachers' responses to the research questions were exemplified by direct quotations. In qualitative research, internal reliability, which is based on the principle that more than one researcher measures an event in the same way, is used. For this purpose, more than one researcher is expected to analyze and compare the data, and in doing so, it is necessary to pay attention to the consistency between the coding methods (Yıldırım & Şimşek, 2011). In this study, the coding of the researcher was checked by another researcher who is an expert in the field and a consensus was reached. Furthermore, to ensure external reliability, attention should be given to the following points: clearly describing the role of the researcher, defining the research group, research environment and process, defining the conceptual framework used in data analysis, and detailing the data collection and analysis methods (Miles & Huberman, 1994). To ensure the reliability of this study, the role of the researcher was clearly explained, and the study group, study process and data analysis were described in detail.

Data collection

Teachers were informed about the focus group interview process. It was presented as preliminary information that there were no right or wrong answers in the interviews and that there were questions that they would express their opinions about organizational identification in general. The reason for recording the interviews was explained as the transcription of the conversations into text and the most accurate transfer of the participants' statements. Only their expressions were used, and their identity information was kept confidential. The total number of teachers participating in the focus group interviews was 12. Two different focus group interviews were conducted separately with vocational course teachers and separately with culture course teachers.

For the focus group interview, it is necessary to organize a place where the participants can feel comfortable and where there are no details that may distract the attention of the participants. To achieve this goal, the interviews were conducted in the teachers' rooms of the schools outside of class hours. The participants were numbered from 1 to 6 and positioned in a circle. The moderator and the observer were placed after number 6 and before number 1. Before collecting the data, the participants were asked whether anyone objected to the voice recording. As a result of the fact that there was no objection, the voice recorder started to operate at the time of the interview. At the beginning of the interview, the researcher and moderator introduced themselves and informed the participants about the purpose of the study. A total of 7 questions were asked, and details about how long the interview would take were given. Both focus group interviews were completed without any interruptions. In both interviews, the answers to the questions became more sincere after a while. Teachers provided more sincere answers as they shared their feelings. At the end of both interviews, all of them stated that the interviews were like a therapy for them and that they were more aware of their feelings. It was observed by the researcher that the facial expressions of the teachers, who were anxious at the beginning of the interview, relaxed as their sharing with their colleagues increased.

Data Analyses

The descriptive analysis method, one of the data analysis methods, was used to analyze the data. According to Yıldırım and Şimşek (2011), descriptive analysis is the description and interpretation of the findings obtained in the light of a predetermined framework. In the descriptive analysis method, the data obtained from the interviews are interpreted and transferred to the reader after being arranged. According to this method, the data obtained were classified and interpreted within the framework of the themes created. Finding themes is one of the most important parts of qualitative research analysis (Gunbey, 2016). The aim of descriptive analysis is to clearly reflect the views of the interviewed or observed individuals by including direct quotations. In this context, direct quotations were made from the opinions of vocational and culture course teachers in the presentation of the findings. The data collected by the researcher were classified within the framework of the

themes obtained from the literature. The focus group interviews conducted in this study were analyzed through the stages of interpretation and interpretation. The interviews were analyzed and transcribed from the voice recorder and thematic coding was subsequently revealed by listening to the audio recordings repeatedly. MaxQDA qualitative data analysis program was used to analyze the data.

Ethics committee approval process

The ethics application for the study was made on 04/10/2023, and the research was carried out with the approval of the Giresun University Ethics Commission dated 08/11/2023 and numbered 10/08.

Results and Discussion

In this section, the findings obtained from the focus group interviews with vocational and culture course teachers working in vocational high schools, and the themes and codes obtained by analyzing the data are presented.

Findings on the Definition of OI

Teachers in both groups stated that they worked with students with low academic levels, but their identification has the same meaning as their students' success in social and sporting activities. It is possible that teachers' job satisfaction and identification with their organizations seem to be intertwined. For example, one of the participants said (P6): "When children are successful, it makes us happy. When they taste the feeling of success, their self-confidence increases, which makes both them and us very happy". On the other hand, another participant (P1) said, "Their achievements in social and cultural areas make us very happy. The slightest change in the success of children with family deficiencies makes us happy". While culture course teachers always had questions in their minds while doing school-related work, vocational course teachers stated that they voluntarily took part in school-related work. Additionally, both groups stated that they work in a fair environment.

Findings on OI Model and Teacher Fit

As a result of the focus group interviews with vocational and culture course teachers, their views on organizational identification were discussed in terms of their conformity with basic identification, developed identification and structural identification models.

By explaining the psychological bond of the individual with his/her organization, these models also explain situations in which identification with the organization changes. Among the models that emphasize the link between identity and identification, the model developed by Scott et al. (2005) explains different identity characteristics, the model developed by Kreiner et al. (2004) explains the relationship between the individual and the organization while Reade's model aims to explain the precursors and differences of identification with the organization and the group (Tokgöz, 2012). The teachers of the culture courses in this study were compatible with identification and structural and basic identification; however, the teachers of the vocational courses were compatible with all the identification models.

According to Reade's (2001) basic identification model, the support of managers, the prestige of the organization, and career development opportunities within the group come to the forefront. In the model, in-group identification precursors and organizational identification precursors are seen as the same, and the strength of the emotional bond, which individuals establish with the group they are in, expresses organizational identification. This identification individual exhibits communal behaviors such as loyalty to the group and cooperation and shares the values of the organization.

According to the results of the focus group discussion with the culture course teachers, the identification of some of the participants can be explained by basic identification. For example, one of the participants who provided an example of basic identification stated that the distribution of departments in his school was fair and that the interests of the teachers were always at the forefront (P5). In this way, basic identification is provided by the support of the administrator and the individual's feeling that he/she is working in a fair organization, as stated in Reade (2001).

One of the vocational teachers (V5) stated that "Because of the equality that is being observed in this school, I think that it has a positive effect on the environment." Another participant (V6) said, "No one's interests are higher than the interests of others. Whatever is necessary is done". Another participant (V4) said, "Our administrators willingly help us when we cannot do something. Although we have some responsibilities and I am asked for something else, I fulfill their requests without questioning them." As Kağıtçıbaşı (2004) noted, as a result of the support of the manager, the individual feels respected in the organization and exhibits positive attitudes and behaviors toward the organization and the manager, proving that basic identification is realized.

Kreiner and Ashfort (2004), in their improved identification model, addressed organizational identification with the dimensions of identification, nonidentification, ambivalent identification, and neutral identification to allow individuals to define themselves in different ways.

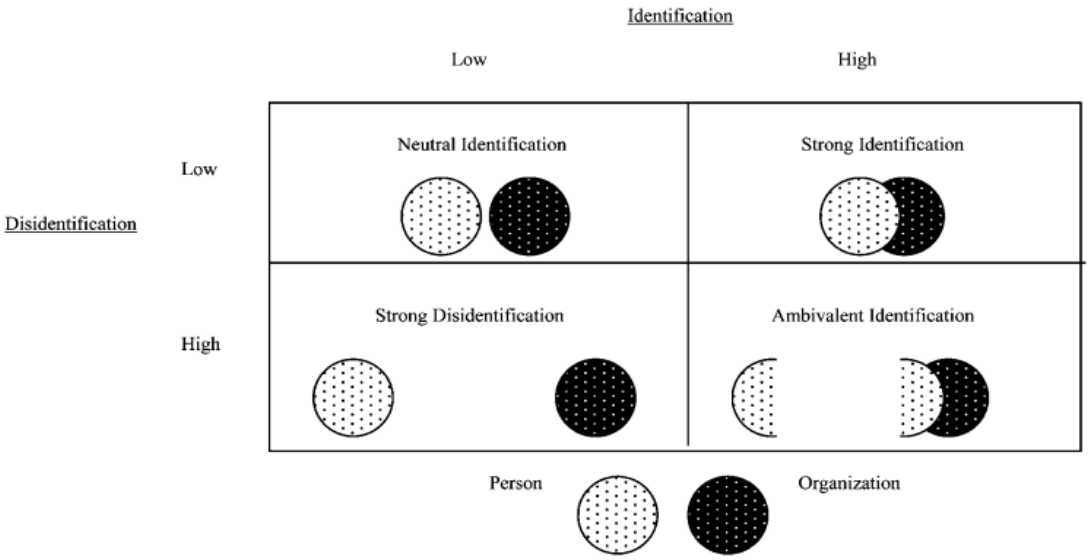

Figure 1. The expanded model of identification. (Adapted from Ashforth, 2001; Dukerich et al., 1998; Elsbach, 1999)

Kreiner and Ashfort (2004) define identification as the positive relation of a person to an entity. In this context, as a result of the focus group interviews with the culture course teachers, it was observed that some of the participants had identification dimensions. For example, one of the culture course teachers (P3) said, "If any of my relatives wanted to work here, I would tell them to choose this school without hesitation because I feel like I have been working here for years". P5 stated that she had been working at this school for 2 years, that it was a large family and that she felt like part of this family. One of the vocational course teachers (V2): "I can work voluntarily in all school-related work even if I do not have a duty. Because the institution I work for is considered my home". Another participant (V5) said, "Unfortunately, I have never experienced such a sincere working environment in any of the schools in which I have worked thus far. People are truly honest here; I have friends I see outside the school", demonstrating his identification with the institution. As Rousseau (1998) states, the individual who sees himself as part of the organization experiences identification and becomes part of the group.

Disidentification is a way of consciously separating one's identity from the organization. The individual has a negative perception of the organization's goals and objectives (Kreiner & Ashforth, 2004). The culture course teacher (P4) has been working in this school for 11 years with students who are academically weak and he wants to work with students who are better. As stated by Kreiner and Ashforth (2004), since the individual does not adopt the values of the organization, he/she does not feel that he/she belongs to the organization, causing the state of nonidentification. The interview findings with vocational course teachers revealed no evidences that could be an example of the nonidentification dimension.

It is also possible to be defined as both identifying and not identifying with the organization at the same time. In cases where the aims and objectives of the organization are unclear or communication is poor, the individual may identify with the organization on the one hand and not identify with some aspects of it on the other hand. This is referred to as 'ambivalent identification' (Kreiner & Ashfort, 2004). One of the participants (P1) who showed an example of ambivalent identification as a result of the interview with the teachers of the culture course:

"This school does not offer any opportunities; in fact, there are many drawbacks. It is a school where academically very unsuccessful students come together, and when I look at it from the point of view of my own branch, I can never get efficiency. Despite all these negatives, I can say that there is a very good synergy between me and my colleagues. Everyone is very helpful to each other, we work in a pleasant environment…In

this school, the students do not satisfy me academically, I do not work efficiently professionally, but I have friends who are a source of happiness in terms of my friendship environment so I do not plan to leave". This participant both stated that he was not happy working academically in the organization and showed an example of ambivalent identification by stating that he was happy thanks to his harmony with his colleagues. As Tüzün (2006) points out, the individual's values and the organization's values may be consistent or contradictory. In this context, the individual accepts some values and rejects others. There was no statement that could be an example of ambivalent identification in the results of the interviews with the vocational course teachers.

In the neutral identification dimension of the developed identification model, the individual feels neither positive nor negative toward the organization. One of the participants (P6) who showed an example of neutral identification in this dimension said, "I would like to help with something I can do, but if the job is left to me and I am told to do it every time, then I look for an ulterior motive". Another participant (P2) said, "When we are given a task by the school administration, I look at the task, see if it is related to me and think why my other friends are not doing it. If it is related to my work, then I do it. In the early years of my career, I used to volunteer to do all the tasks, but as I got more senior, I felt less inclined to do them". Individuals with neutral identification consciously avoid excessive involvement (positive or negative) because of their past experiences with their organization. Another participant (P4) stated that "every job can be done depending on the situation but in some cases teachers should know how to say no", and as Kreiner and Ashfort (2004) stated, by working with the mentality of "I just do my job", they are neutral toward the goals and values of the organization and feel less involved in the organization compared to other members who make extra effort.

The structural identification model developed by Scott, Corman and Cheney (1998) discusses the concept of commitment. Positive outcomes such as organizational identification and loyalty are measured by the level of commitment. An individual's work group determines his or her identity in the group in which he or she works as shown in the figure below.

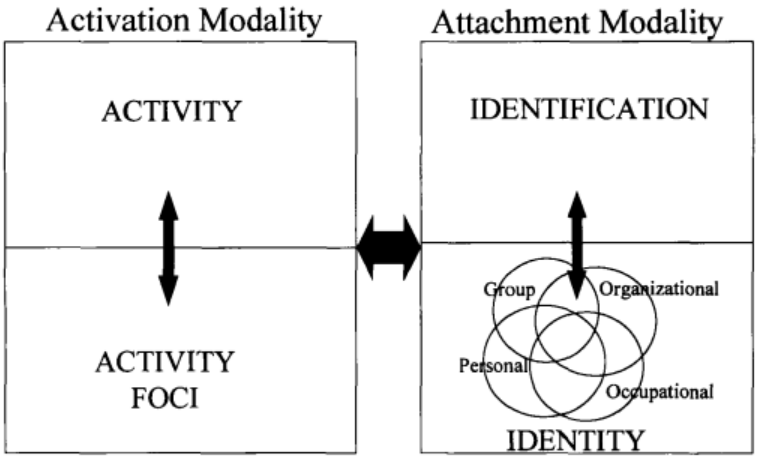

Figure 2. Scott, Corman and Cheney's Structural Identification Model (Scott et al., 1998).

According to the interviews conducted with the teachers of the cultural courses, some of the participants' identification can be explained by structural identification. For instance, one of the participants (P4) said, "We have a high number of students who come from broken families, and the families have no expectations or concerns about the educational status of their children. In this case, the task falls to the teachers. In this sense, our school, with all its teachers, is very committed to this task". He emphasized the concept of commitment, which is important in structural identification, and provided an example of structural identification. Another participant (P2) said, "I am very happy to work here, but the interests of the students come first; we should all think about that. The interests of our students come before the interests of the school. Even there, decisions can be made against me. This situation does not bother me". There is a direct correlation between the degree of identification and the degree to which a person is affected by the situation in which they find themselves. In sudden crisis situations, individuals in an organization become more supportive of the organization, their willingness to cooperate increases, and organizational identification occurs (Scott, Corman and Cheney, 1998).

As a result of the interviews with the vocational course teachers, one of the participants (V3) who showed an example of structural identification said, "Since we are all in the same boat, in my opinion, the interests of our school should have prioritized our individual interests". The other participant (V1) stated that he

wanted to work in this school until he retired and that this was due to the working environment and his relationship with his friends (V5): "I am here as I wanted to be in the same city as my partner, but I do not plan to leave this school because I like the school environment and my friends". In this way, as Scott, Corman and Cheney (1998) note, structural identification is expressed both as a process of commitment and as a product that emerges as a result of that process. Commitment is expressed in terms of the social membership perceived by the individual and the relationship between the individual and the social environment in which he/she is located.

Findings on OI Model and Teacher Fit

Organizational image, as defined by Örücü (2003), is the perception of an organization by individuals and the impression they have of the organization. Organizational image is created as a result of the interaction between environmental elements and organizational members. This image is positive when individuals outside the organization perceive the organization positively, and negative when they perceive it negatively. As a result of the interviews with the culture course teachers, the majority of the participants showed that they were affected by the negative organizational image perceived by other individuals toward the institution they worked for. For example, one of the participants (P6) said, "Negative thoughts affect me a little bit. When they ask me where I work and I say vocational college, the conversation stops there. Because it is considered to be the school where the most unqualified students come from". Another participant (P3) stated that the perception created by the outside world affects him negatively. A negative experience with any part of an organization can create a negative image. The fact that external stakeholders and members of an organization who have in-depth knowledge of the organization have positive and accurate impressions leads to a positive organizational image (Bakan, 2005). For example, one of the participants (P2) said, "I do not think that the parents of the students who know us, who know our school, have a negative perspective".

As a result of the interviews with vocational course teachers, some participants showed negative image perceptions. For example, one of the participants (V1) said, "Of course, it affects me negatively when others say that my school has little success and is bad. However, I continue to do my job because my conscience is clear. There is a perception of vocational high school teachers outside, and this situation affects me and I am sure my other friends negatively". Another participant (V6) said, "In some schools, we hear that children who do not study are told that if you do not study, you will go to vocational high school, which shows that, unfortunately, society's view of our school is negative. I am not very negatively affected by this situation, but it is frankly hurtful to me that what we are doing is not appreciated and seen by people". Negative perceptions of an organization's image are known to have a negative impact on members of the organization and cause them stress, as noted by Dutton, Dukerich and Harquail (1994).

Conclusion & Recommendations

OI is defined as an individual's acceptance of belonging to a particular group and the overlap between the values and goals of the organization and his or her own values. In this study, the qualitative views of vocational and culture course teachers working in vocational colleges on organizational identification were examined using a focus group interview technique. When examining the differences in the views of culture and vocational course teachers on organizational identification, no difference was found between the degree and type of identification of teachers with the school where they work according to demographic and professional characteristics. This situation is consistent with the findings of some studies on teachers' organisational identification in the literature (Aliyev, 2014; Kaplan, 2020; Kurtulmuş & Karabıyık; Mıhcı, 2019; Özbaş, 2020; Sezgin-Nartgün & Demirer, 2016; Yaşa, 2018). Teachers' organizational identification does not differ significantly according to their length of service in their schools. The results of Polat's (2009), Aliyev's (2014) and Akpınar's (2014) studies are similar to these findings. While there were participants among the cultural course teachers who wanted to continue their profession in other schools due to academic inadequacy, it was observed that all the vocational course teachers were willing to continue their profession in this school.

The relationship between employees and their organizations plays an important role in OI. Being a vocational or cultural course teacher does not have a significant effect on the relationships between teachers. A positive organizational climate and positive communication between employees enabled both groups of teachers to identify with their organizations. When the organizational member participates in the mutual transfer process within the organization and adopts the values, identification with the organization is realized. According to Haslam (2004), when an individual identifies with his/her organization and adopts group membership, he/she is more motivated to contribute to group goals as opposed to personal interests. As stated by Başer & Ehtiyar (2019), appreciation and motivation increase the motivation of employees and help them identify with their organizations. The literature review has shown that the content of the communication that the organization or management establishes with the employee is a factor that influences identification.

While it is common among cultural course teachers that they can object to the assigned tasks, if necessary, all vocational course teachers indicated that they can voluntarily participate in the assigned tasks and showed that they are more likely to identify with their organizations. It is assumed that the fact that vocational course teachers are more together with their students has an effect on the higher level of organizational identification of vocational course teachers compared to branch teachers. The views of the culture course teachers working in vocational high schools on organizational identification were investigated, and the participants' agreement with the organizational identification models was examined. The majority of the participants identified with their organizations. A significant proportion of teachers are satisfied with their work in these schools. Working in vocational schools does not contribute academically to cultural course teachers. The main reason for this is that students with low performance in secondary school are directed to vocational schools. As a result, teachers' academic knowledge atrophies rather than progresses. In this case, although some teachers show an example of nonidentification, at the same time, both the positive and fair attitudes of the school administration and cooperation in the working environment contribute positively to their identification. Furthermore, studies have shown that there is a positive relationship between teachers' perception of administrative support and their organizational identification (Gillet, 2013; Uzun, 2018; Van Knippenberg, 2007). A positive organizational communication climate increases organizational identification. As stated in the literature, when individuals adopt the behavioral patterns of the organizations they belong to and feel connected to that organization, it means that there is identification (Balay, 2014).

When the views of the vocational course teachers on organizational identification were examined, it was found that all the participants identified with the organization they were in. It is inevitable that individuals who share common beliefs with their organizations and fully adopt the values and goals of the organization will identify with their organizations. As Riketta (2005) states in the literature, an individual who is in solidarity with his/her organization and who develops his/her attitudes and behaviors toward the organization in a positive way provides OI. Teachers identify with the school in which they work and adopt the school's successes as their own successes and its failures as their own failures. In this context, teachers feel a sense of psychological commitment and belonging to their schools, tend to internalize the aims, values and culture of the organization, and see themselves as part of the organizational unit.

According to the views of the participants working in vocational colleges on the image of their schools, the time spent in the profession and the sector in which they work do not affect their perceptions of the image of their schools in any way. Studies in the literature (Smidts, Pruyn, & Van Riel, 2001; Edwards, 2005; Keh & Xie, 2009) have shown that there is a positive and significant relationship between perceived organizational image and OI. In this sense, as employees' perception of organizational image increases, the level of OI also increases. The majority of the participants were willing to continue their work in the organization despite negative image perceptions in the environment and wanted to continue for many years. In this context, it can be said that perceived negative image does not have a strong effect on identifying with the organization.

This research was conducted with teachers working in a vocational high school. As a result of this research, it was found that there are very few studies on the types of OI of vocational high school teachers in Türkiye. So, it is suggested that the types of organizational identification of teachers should be addressed in future studies. Conducting the study in different provinces and different institutions will make it possible to conduct comparative studies on the organizational identification of vocational high school teachers. It is believed that expanding the literature on this topic will contribute to the recognition of the importance of organizational identification. This study, which was conducted according to teachers' perceptions, can be improved by taking the opinions of students, who are the other stakeholders of the school, and by investigating the effects of teachers' organizational identification levels on students' achievement. This study, based on teachers' perceptions, can be developed by applying it to the perceptions of school administrators, students and parents. For policy makers, it could be suggested that newly appointed or reassigned teachers should be supported by school administrators and senior staff in the process of adapting to their schools. Harmony between school management, teachers and the school should guide the process. To increase organizational identification, democratic, collaborative, and communicative working environments should be created. The working conditions of teachers should be improved by the school administrator, their achievements should be appreciated, and they should be proud of being teachers of the school where they work.

Acknowledgments or Notes

The author conducted the study alone as a project of the Educational Management Master without Thesis Program. There are no conflicts of interest. I would like to thank my manager and friend, Merve Çakır Bayram, who accompanied me during the research, and my colleagues who volunteered for the study. I would also like to thank my supervisor, Eray Kara, who helped me complete this study.

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Article History
Received: 02.04.2024
Accepted: 28.06.2024
Available online: 30.06.2024
Article Type: Research Article

ADIYAMAN UNIVERSITY
Journal of Educational Sciences
(AUJES)

https://dergipark.org.tr/tr/pub/adyuebd

Thematic Modeling of Pre-service Mathematics Teachers' Reflections on ChatGPT Use: Appraisals, Ethical Challenges and Aspirations

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To cite this article:
Kaplan, O. (2024). Thematic modeling of pre-service mathematics teachers' reflections on ChatGPT use: appraisals, ethical challenges and aspirations. *Adiyaman Univesity Journal of Educational Sciences, 14*(1), 21-35.

Adiyaman University Journal of Educational Sciences

Volume 14, Number 1, June 2024, Page 21-35 ISSN: 2149-2727
DOI: http://dx.doi.org/10.17984/adyuebd.1463794

Thematic Modeling of Pre-service Mathematics Teachers' Reflections on ChatGPT Use: Appraisals, Ethical Challenges and Aspirations

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Abstract

The global proliferation of generative AI is being debated because of its implication on education. Despite rapid adoption of ChatGPT-3.5 in educational settings, research is scarce as educators and institutions are not fully prepared to face the potential unforeseen and long-term consequences of ChatGPT on student learning dispositions. This study explored pre-service mathematics teachers' experiences with ChatGPT and their perceptions regarding its affordances, ethical issues, and potential uses in education and future teaching. Using a convenience sampling, 25 second- and third-year pre-service mathematics teachers (22 female and 3 male) participated in the study. Qualitative data were collected from semi-structured online interview forms and a subsequent focus group discussion, which were analyzed using thematic analysis methodology. A perceptual model of ChatGPT adoption (PMCA) including five main themes were developed: familiarity with ChatGPT, positive appraisals, dissatisfactory experiences and ethical concerns, aspirations to use in mathematics teacher education, and aspirations to use for prospective teaching. The research results showed that teacher candidates found using ChatGPT in their education useful, but they also expressed their concerns about the difficulties and ethics of using ChatGPT. This study aims to provide empirical evidence for educators, policy makers, and future research to contribute to the current conversations about AI in teacher education programmes.

Key words: Artificial intelligence, Teacher education, Ethics, Thematic analysis

Introduction

Innovative technologies have been developed around the world and their incorporation into educational settings is an ongoing global effort. Yet, there is still a 'notable absence' of studies about the use of Artificial Intelligence (AI) in pre-service teacher education (Celik, 2023; Celik et al., 2022). Additionally, many intelligent systems are being used in mathematics settings (Moore et al., 2023) whereas researchers have highlighted that most of AI-related studies and developments lack educational perspectives (Celik et al., 2022; Cope et al., 2021; Zawacki-Richter et al., 2019). Moreover, controversial theoretical discussions on the impact of unprecedented opportunities and ethical concerns, such as jeopardizing academic integrity (e.g., Cotton et al., 2023; Hung & Chen, 2023) surrounding the use of ChatGPT, an artificial intelligence, in all levels of education necessitates the exploration of this emerging research avenue in teacher preparation programs.

ChatGPT is a generative artificial intelligence language model that operates based on machine learning techniques to generate responses over the textual data that it is trained on. The implications of ChatGPT usage in education are still in its emerging stage. Some recent studies have examined undergraduate students' perceptions and experiences regarding ChatGPT, including computer engineering students (Shoufan, 2023) and elementary school teachers (Lozano & Fontao, 2023). Tapan-Broutin (2023) observed pre-service mathematics teachers'(PMTs) initial unsupervised interaction with the application and reported that their highest level of curiosity was on humanoid (i.e., emotional and empathetic) aspects of ChatGPT and on academic assistance capability thereof. However, there are very limited research on PMTs' perceptions of ChatGPT and their intention to use it for college education and future teaching. Moreover, most of previous research on AI primarily utilized quantitative methods and lacked critical reflections and challenges pertaining to the use of this novel technology in higher education (Zawacki-Richter et al., 2019). Therefore, this qualitative study aims to contribute to literature by examining the use of generative AI in education. It investigates PMTs' familiarity with ChatGPT, their perception of its utility in college education and teaching mathematics, and ethical concerns surrounding its use. The findings aim to guide prospective teachers, educators in higher education, and future research on effective teacher education programs utilizing AI's benefits while taking ethical considerations into account.

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Theoretical Background

Artificial Intelligence and Its Affordances in Education

The most plausible definition of *AI* is "computing systems that are able to engage in human-like processes such as learning, adapting, synthesizing, self-correction, and use of data for complex processing tasks" (Popenici & Kerr, 2017, p. 2). AI is intertwined with education and has the potential to transform education systems that is long overdue. Harnessing its potential can effectively support UNESCO's pedagogical goals of *The Global Education 2030 Agenda* by ensuring more equitable and inclusive educational systems through its accessibility and connectivity (Holmes & Miao, 2023). AI can support student learning through monitoring students, group management (i.e., group formation, group moderation and group facilitation), automated assessment and data-driven decision-making (Crompton & Burke, 2022). Specifically, some positive affordances of various AI technologies include timely feedback and individualized content (Anderson et al., 1995; Chen et al., 2023), personalized support for large-scale online learning environments (Seo et al., 2021), identifying and supporting students with learning difficulties (Moore et al., 2023), assisting teachers with improved planning and assessment of their pedagogy (Celik et al., 2022), scaffolding student learning process and improving student critical thinking of AI suggestions (Kim et al., 2022), and offering immediate and ongoing formative assessment (Reiss, 2021). AI technologies can also support teachers with the generation of curriculum content, activities, and assessment (Cooper, 2023). Gaining competence in using educational technology has also been shown to increase pre-service teachers' self-efficacy (Joo et al., 2018). Similarly, teachers with more knowledge about the affordances of AI are more aware of their contributions to their instructions (Celik, 2023), which may increase the likelihood of incorporating AI into their teaching as an instructional component. Although the potential use of AI has not been harnessed to a large extent, mathematics teachers can be empowered by leveraging the affordances of AI—specifically, the affordances of ChatGPT in this study—to meet their instructional needs (Luckin et al., 2022) and have students reap the aforementioned benefits in their learning.

Difficulties of Applying AI into Education

Difficulties and ethical concerns related to the use of AI in education abound in the literature. The application of AI in education not only creates the desired affordances mentioned above, but also raises ethical challenges such as individual privacy issues, potential built-in algorithmic biases, reliability of responses, and equitable access opportunities (Reiss, 2021; Roscoe et al., 2022). Its application in the educational field also has its own inherent technical and technology-adoption-related difficulties.

The literature indicate that AI technologies are run by AI algorithms and supplied data, which can transmit the biases of the suppliers, users, and developers of the technology (Popenici & Kerr, 2017). AI-based technologies can make systematic and repeatable errors (Celik, 2023), widen educational inequalities and focus on a narrow conceptualization of education (Reiss, 2021), and compromise academic integrity (Cotton et al., 2023; Hung & Chen, 2023). Furthermore, teachers are concerned that AI technologies might diminish students' critical thinking, creative problem solving, and independent learning abilities (Wogu et al., 2018). According to teachers, some of the most common challenges to incorporating AI technologies into teaching are questionable reliability of AI algorithms, inadequate technical capacity, insufficient AI-related technical infrastructure within schools, teachers' lack of technological knowledge, and their lack of interest in the technology (Celik et al., 2022).

Ethical Concerns: Responsible Use of AI for Academic Integrity

Academic integrity is an irreplaceable component of scholarly works. One of the main ethical concerns regarding the use of ChatGPT is its impact on plagiarism in academic settings. Academic institutions have already begun to implement ethical guidelines and precautions. For example, New York, Los Angeles, and Baltimore banned ChatGPT from all public-school networks and devices (Cotton et al., 2023). This precaution is partly due to ChatGPT's practice of collecting user data that violates the *Children's Online Privacy Protection Act (COPPA)* for users under 13 years of age. Additionally, ChatGPT's 'Terms of Use' state that users must be older than 18 years. Before the release of ChatGPT, 22% of college students at an Austrian university anonymously reported that they had committed plagiarism (Hopp & Speil, 2021). One of the methods of committing plagiarism is 'contract cheating' services, which is already a challenging and prevalent problem in higher education (Ahsan et al., 2021). Partly due to the widespread use of online assessments—especially, it peaked during the COVID-19 pandemic—plagiarism permeates and threatens academia in relation to college students' learning, critical thinking, skill development, attitudes, and moral development. Free and easy access to ChatGPT, along with its ability to produce creative writings, solutions to mathematics problems, explanations, and summaries multiply the risks associated with contract cheating. Even at a prestigious institution like Stanford University, shortly after the release of ChatGPT, 17% of students used it to assist with

assessments and exams, and 5% admitted submitting ChatGPT-generated materials without editing (Cu & Hochman, 2023). In addition to plagiarism and cheating reported in the literature, concerns about privacy (Shin et al., 2022), reduced agency for learning (Berendt et al., 2020), and in-service teachers' misconceptions about AI technologies (Antonenko & Abramowitz, 2023) are cited as barriers that may hinder the effective development and adaptation of AI applications in educational settings.

Objectives and Research Questions

To address the aforementioned gaps, this study uniquely focuses on pre-service mathematics teachers' perceptions of ChatGPT because of their essential role at the nexus of their educational transformation. The objective of this study was to investigate pre-service mathematics teachers' perceptions and reflections on the ease of use, potential avenues for incorporation, challenges, and ethical concerns related to the use of ChatGPT. The design of this research is organized to find answers to the following research questions.

1. Are pre-service mathematics teachers familiar with ChatGPT?
2. How do pre-service mathematics teachers perceive ChatGPT in terms of its ease of use, usefulness, and technical and ethical challenges?
3. How do pre-service mathematics teachers aspire to use ChatGPT for their academic learning at the university and for their future teaching?

Method

The purpose of this study was to determine PMTs' perceptions and reflections related to the use of ChatGPT-3.5 using online forms consisting of open-ended questions and a follow-up focus group session. The main rationale for investigating this emerging phenomenon with a qualitative research design is to flexibly explore PMTs' perspectives through in-depth analysis of rich data obtained from their natural setting, and to extract practical implications for teacher education and educational policy using thematic analysis.

The study utilized a convenience sample comprising of second-year and third-year middle school PMTs who had been enrolled in a methods course at a university located in the southeastern part of Türkiye. Qualitative data were collected in the Summer of 2022-2023 academic year whereby participants responded to a semi-structured form containing seven semi-structured questions. The form was sent to 27 PMTs and the response rate was 92.9% (N=25; 3 male and 22 female PMTs; 22 sophomore and 3 junior level). Data collection was completed with a follow-up focus group session. For the participants in the study, the average GPA was 2.79 on a scale of 4 (min=2.33, max=3.42). They were not offered any incentives. Before the collection of the data, ethical approval was obtained. Participants were informed of the study details and reassured of the confidentiality of their responses and identity.

Procedure

Teachers comprehend the pedagogical contributions of AI more effectively when their technological, pedagogical and content knowledge (TPACK) increases (Celik, 2023; Edwards et al., 2018). Because PMTs were asked to anticipate the potential use of ChatGPT in mathematics teacher education and prospective teaching, and because pre-service teachers have difficulty envisioning future scenarios using emerging technologies due to a lack of knowledge and skills about the technology (Liu, 2012), PMTs were first trained about AI and its applications in mathematics teaching and learning for two sessions by the researcher. Then, PMTs were given a task regarding the multimodal use of ChatGPT application (See Appendix 1). These included the course content and assignment development, inclusive education practices and mathematical problem solving. Having completed the tasks, a semi-structured form (see Appendix 2) that consisted of semi-structured questions was distributed. The questions in this form along with the questions asked during focus group session were created based on insights into the identified gaps and concerns in the literature. The suitability of the questions (i.e., clarity, relevance and the scope of the semi-structured questions) was discussed with two colleagues to increase content validity and necessary adjustment were made based on their recommendations.

To increase the credibility of the findings and clarify pre-service teachers' responses to the questions and additional reflections, the data was triangulated by conducting a virtual focus group meeting (Vaughn et al., 1996) using Zoom video-conference software. This focus group session was also intended to reveal nuanced perspectives that were socially and interactively constructed by the cohort (Cohen et al., 2013). Some questions asked during the focus group session included "How do ChatGPT's explanations and recommendations differ from what mathematics educators can offer? What would be the advantages and disadvantages of each?" and "Do you have any ethical concerns or thoughts regarding the use of artificial intelligence such as ChatGPT in teaching and learning mathematics?" Answers to these questions were delineated with unstructured follow-up questions. Because focus group discussions have the disadvantage of being dominated by a few vocal

participants (Green & Thorogood, 2014), participation in the online meeting was voluntary and all participants were encouraged to participate in the discussions. Nine PMTs—all female sophomores—voluntarily participated in this meeting. Audio and written responses were transcribed for further analysis. The corpus of data consisted of PMTs' written responses to online interview questions. Data obtained from focus group discussions were used as complementary data.

Analytical Framework

Thematic analysis is a qualitative research methodology within interpretivist paradigm that assists in exploring the experiences, perspectives, and concerns of participants (Braun & Clarke, 2006) by applying fundamental cognitive processes of 'categorizing, prototyping and metaphorical mapping' in a methodical way that is flexible, logical, disciplined, creative and rigorous (Liu, 2023). Unlike earlier weak or narrow AI applications such as artificial neural networks and computer vision, the development of strong AI or human-like AI applications is the new niche (Pham & Sampson, 2022). ChatGPT, with its human-like abilities to perform certain tasks, falls into the latter classification. Thus, thematic analysis is a well-suited method to unravel the unexplored aspects of this unprecedented strong AI with rich in-depth data in a comprehensive fashion.

During the analysis of online form responses, descriptors were produced. The student background variables included gender, university level, GPA, and familiarity with ChatGPT (See Table 1). PMTs' online form responses were analyzed as per Braun and Clarke's (2006) principles and procedures for thematic analysis. Initial codes were created for the answers and reviewed with an external reviewer. An exploratory inductive approach was used to create subtopics, topics, and themes. This iterative process involved reviewing, refining, merging, and separating codes, subtopics, and topics. Because the data were collected and analyzed using a qualitative research design and analysis, statistical sample size is mostly irrelevant (Flick, 2009). Sufficiency of the sample is gauged by 'theoretical saturation', which occurs when adding new samples do not yield a novel category of the codes (Glaser & Strauss, 1967). After analyzing the responses to online forms, the focus group session was transcribed and analyzed similarly. All qualitative analyses were conducted using Dedoose software.

Table 1. Demographic characteristics of participants (N=25)

Descriptor	Options	Descriptive Statistics
Gender	Male	N=3
	Female	N=22
University Level	Sophomore	N=22
	Junior	N=3
GPA	Continuous scale of 0 to 4.0	$\bar{X} = 2.79$ min = 2.33 max = 3.42
CHatGPT Familiarity	Never used/heard before	N=16 (64%)
	Heard but never used before	N=4 (16%)
	Used before	N=5 (20%)

Establishing the Trustworthiness of the Findings

In qualitative research, evidence for *trustworthiness* is established to increase the rigor and objectivity of the analysis of self-report data. Trustworthiness can be conceptualized by the criteria of credibility, dependability, transferability, and confirmability (Lincoln & Guba, 1985). The *credibility* of the findings was established by i) researcher triangulation by exchanging ideas on the appropriateness of the codes with an external reviewer during the initial coding process, which is conducted on seven semi-structured forms and finalized by consensus, and ii) data triangulation with the focus group session (Lincoln & Guba, 1985). Qualitative research embodies subjectivity but potential biases were cross-checked by the external reviewer in initial coding. Data dependability was ensured through hierarchical, systematic, and transparent coding process (Flick, 2009). The criteria of *transferability* can be assessed by using the descriptors of the participants in Table 1, where the

results should be transferable (or generalizable) to pre-service mathematics teachers in similar teacher education programs. In addition, the *confirmability* criterion is concerned with clear delineation and justification of the case in which interpretation and conclusions are derived from the data (Nowell et al., 2017). Clear descriptions of themes developed after data saturation and comparison of findings with the literature in the discussion section also provide evidence of transferability and confirmability. Finally, to ensure consistency and cohesion of the empirical findings, an interpretivist epistemological approach was applied throughout the data analysis procedure (Holloway & Todres, 2003).

Ethics Approval

The study received ethical approval from Gaziantep University Social and Humanities Sciences Ethics Committee (342157-6.7.2023) for this research.

Findings

Although a convenience sampling was used for data collection, theoretical saturation was achieved in the final responses. In other words, the analysis did not yield additional category of codes (i.e., topics and themes) during the analysis of the final responses. As a result, thematic analysis yielded five main themes derived from 354 initial codes. These themes are familiarity with ChatGPT, positive appraisals on using ChatGPT, dissatisfactory experiences and ethical concerns about using ChatGPT, aspirations to use it for mathematics teacher education, and aspirations to use it for prospective teaching. The themes and topics of each theme in the ad hoc *perceptual model for ChatGPT adoption (PMCA)* are shown in Figure 1. Pseudonyms (i.e., P1 - P25) will be used to represent the participants in order to keep their identities confidential. Finally, inside direct quotations, additional words/phrases have been added in brackets to avoid shifting the meaning by capturing certain nuances in the languages.

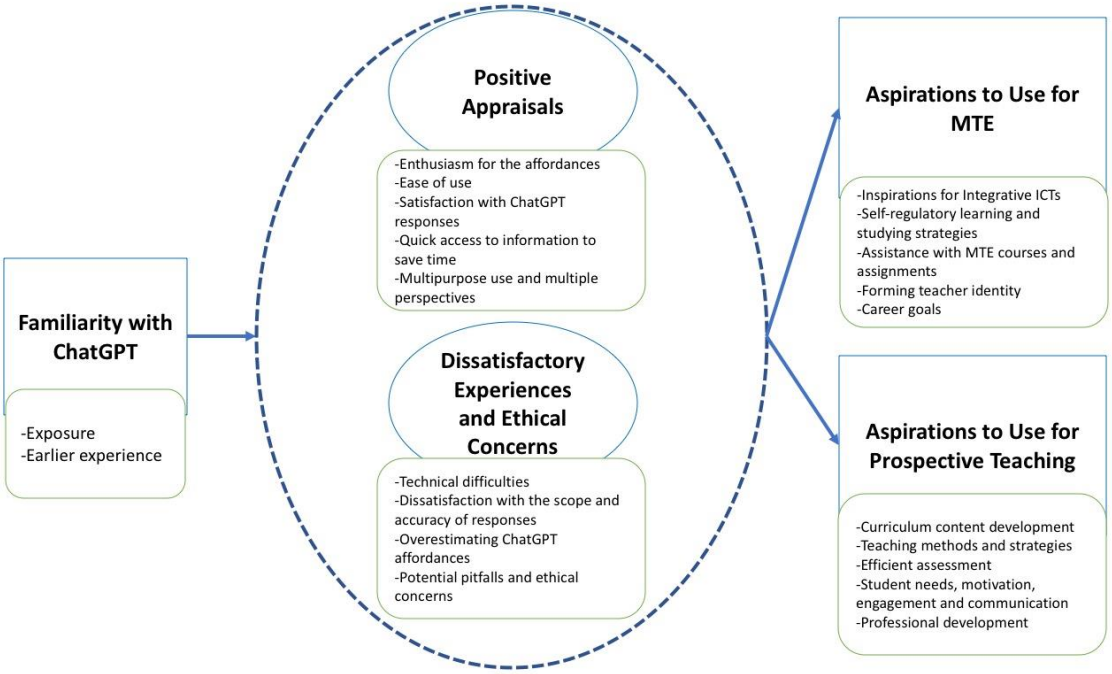

Figure 1. Mathematics teacher education perceptual model for ChatGPT adoption (PMCA)

Note: MTE: mathematics teacher education; ICT: Information and communication technology

Familiarity with ChatGPT

The first research question was to determine PMTs' familiarity with ChatGPT. The first topic under this theme is exposure. Out of 25 students, only nine PMTs had heard of the application before, of which five had used it before for university assignments and to satisfy their curiosity. The other four participants had heard of the application but had never used it. One participant (i.e., P25) admitted to using another AI application, but she was not familiar with ChatGPT. Although 20% of the students in the sample had already started using ChatGPT for higher education before the Summer of 2023, familiarity with and adoption of the application seems almost inevitable due to the widespread use of information and communication technologies (ICT).

The second topic generated under this theme is earlier experience. PMTs with prior experience mostly used the tool to understand some concepts, do homework, solve advanced math problems, or understand the proofs for mathematical formulas. Some PMTs had used it to test the emotional capabilities of the application such as, "Frankly, I wondered what kind of feedback I would get from an AI when asked about human emotions, abilities, etc. I asked questions in line with that curiosity and purpose" (P17). These different initial preferences for the use of ChatGPT and its integration into the education of individuals show its potential for personalized learning.

Positive Appraisals on Using ChatGPT

The PMTs clearly expressed their *enthusiasm for its affordances*. They were generally amazed by its capabilities, the point at which it had reached with its affordances. Some respondents expressed disappointment that they had not known about it before.

> "…because it gives me ideas about my questions in my academic learning. My question is: Why didn't I know before? Which applications can I use to improve my teaching approach?" (P24)

Awareness of ChatGPT led to questioning of other ICT tools that could aid university education, specifically in learning math, doing homework, and enhancing teaching skills. The responses generally indicated that PMTs perceive ChatGPT as a "supplemental" study assistant for their learning and teaching. Some respondents expressed an eagerness to engage with it afterwards and brainstormed about how they could use it to develop their prospective teaching.

ChatGPT is considered user-friendly due to its chatbot design. Seven PMTs had no technical issues initially. Some faced minor setbacks but overcame them by giving clearer input and utilizing ChatGPT features. They also liked its versatility and free access on mobile devices and computers.

The PMTs mostly expressed *satisfaction with ChatGPT-generated responses*. Most PMTs preferred its direct, clear, and concise answers to their questions and found this feature superior to other search engines. They also found the step-by-step procedural solution for problem-solving helpful.

> "Unlike other search engines and browsers, the application gives clear, single and understandable answers to the question I ask. In this way, there is a fun and effective transfer of information in a conversational atmosphere. Because of these aspects, I can say that it is a very useful application and I was a little sad that I had not discovered it before." (P18)

The excerpt exhibits human-like features of ChatGPT that positively impacted the PMTs' perception, setting it apart from other search engines. While a few PMTs found its answers partially satisfactory, the majority perceived them as comprehensive, explanatory, and accurate, and providing multiple solutions and perspectives.

> "For example, in the first question of the course content preparation section, I was tasked with creating a performance assignment. The initial submission contained convoluted instructions. Therefore, when I directed the question to artificial intelligence again, the instructions were given in more detail and at the same time a detailed example was given and this enabled me to better grasp the subject." (P18)

One of the pitfalls that the PMTs failed to realize was ChatGPT's response accuracy. Some PMTs were completely satisfied with the accuracy despite potential errors. Whereas students might trust ChatGPT without considering biases and errors, five PMTs believed in the accuracy without recognizing limitations, but almost half of the PMTs admitted this limitation.

Another emerging topic was *quick access to information to save time*. Compared to searching for information on search engines, its quick access to information was perceived as a distinct advantage. They expressed their satisfaction with the rapid creation of content, solutions, translation, and presentation slides. One participant stated that

> "Especially from the questions above [given practice questions], I realized better that it is a very necessary application in terms of teaching. Because, as we know, since the entity, who we are responsible for in teaching, is human, almost everything can occur improvisationally and you may feel the need to meet your instant information needs in a deep and explanatory way." (P17)

As noted by this respondent, teachers frequently receive questions from their students. Respondents pointed out that ChatGPT can assist in brainstorming ideas, demonstrate various approaches to solving problems, swiftly produce particular exercises and lesson plans, and offer specific examples in such situations.

As per the PMTs, an additional perceived benefit of the application is its versatility, i.e., *multipurpose use and multiple perspectives* in meeting diverse individual needs. They specifically expressed its ability to answer questions on a wide range of areas, such as mathematics, alternative teaching methods, technical inquiries, real-life problems (including politics), and other aspects of life. Additionally, during the focus group session, PMTs reiterated these useful features of ChatGPT, such as step-by-step solutions for math problems, multiple solutions that foster diverse perspectives, and the creation of thorough assessment tools (such as project and performance-based assessments) with clear instructions.

> "I asked it to generate solutions to the questions I asked several times and thus aimed to see the difference. In this way, [prospective] students can better understand the subject by seeing different interpretations instead of seeing a single point of view." (P18)

In addition, they find the answers provided by the platform to be more informative than those provided by an educator. Thus, these findings suggest that some of the PMTs' needs for guidance and mentorship can be met by ChatGPT or AI applications designed for this purpose.

Dissatisfactory Experiences and Ethical Concerns

The PMTs reported technical difficulties with receiving responses, specifically irrelevant and less-efficient responses when a non-English input was entered. Several PMTs encountered the problem. When Turkish was chosen, unsatisfactory responses and occasional errors occurred. However, choosing English resulted in more logical responses, even with Turkish input. The issue might also happen with other languages. The PMTs reported technical problems with browser or device configurations, server-related issues, and glitches with ChatGPT. The problems included tab closures, errors on different devices, delayed responses, and incorrect answers. Several PMTs also mentioned incomplete responses. However, some PMTs discovered that when the application was prompted with the input "continue generating the response," they received the remaining incomplete responses. These issues and the PMTs' creative problem solving experiences to overcome some of these challenges were re-stated in the focus group session.

Some users expressed dissatisfaction with the application's scope and accuracy of responses. Possibly due to asking vague or general questions without specified parameters, some PMTs found ChatGPT's responses to be insufficient, overly lengthy, and overly broad.

> "The downside is that even though it answers questions, the answers it gives sometimes do not satisfy you. By constantly reminding you that it is artificial intelligence, it actually causes some answers to leave you unsatisfied. But as human beings, I guess we don't want any question marks to remain in our minds." (P9)

Some PMTs expressed concerns regarding response accuracy. While response accuracy to verbal questions was not questioned, some mathematics question answers were criticized, with one respondent stating, "I am uncertain about the correctness of the answers because some of the equation questions I asked were not answered correctly" (P23). Other dissatisfactions related to teaching and learning included ChatGPT's inability to generate mathematical representations, inappropriate answers regarding students' developmental level of understanding, and insufficient capabilities to generate higher-level knowledge. The PMTs acknowledged that ChatGPT's responses are suitable for attaining general knowledge; however, they found it inadequate for fostering and supporting higher-order thinking and learning. Moreover, during the focus group session, they emphasized ChatGPT's ability to provide extensive information but noted its incapacity to offer emotional and personalized responses, hindering the attainment of solutions for students' problems by neglecting their emotional and psychological state.

> "Since ChatGPT is an artificial intelligence, it is insufficient in conveying emotions, for example, a student has a prejudice against mathematics, it can guide us for this, but our approach to the student needs to take into account the student's emotions." (P21)

In this session, the PMTs also complained about errors or fake citations generated by ChatGPT, as well as non-existent links.

Some PMTs overestimated the affordances of ChatGPT by expecting it to exhibit human-like emotions, perceiving its responses as infallible, and anticipating access to all research articles. ChatGPT can summarize known publications but lacks access to research articles not in its training data or published after 2021 during the study. Additionally, one question in the online form required the PMTs to draft inquiries they would like to pose to ChatGPT. Some of the questions they pose were very general or unclear questions without elucidation such as "How will our internship training be like?" (P22) and "What are the subjects that we will see in mathematics but have not learned yet?" (P23). Some PMTs may inadvertently engage in such tacit assumptive

discourse in their prospective teaching which can exacerbate misunderstanding and miscommunication in teaching mathematics.

Numerous potential pitfalls and ethical concerns were raised by the PMTs. One concern was the potential for AI to replace teaching jobs. One PMT (P19) recognized that AI may lead to decreased employment opportunities in various fields. Additional concerns centered around two subtopics: potential misuse by pre-service teachers and the adverse effects such misuse could have on students. The PMTs generally recognized that ChatGPT ought to serve as a supplemental tool rather than an ultimate solution.

The PMTs acknowledged that ChatGPT can be misused for assignments that do not necessitate higher-order thinking and posed inquiries regarding preventative measures (e.g., P11). Although ChatGPT's potential use for cheating on exams and assignments was not explicitly mentioned in verbatim in responses to interview questions, in the focus group session, multiple PMTs expressed these concerns. They pondered the prevalence of cheating in their prospective teaching and anticipated that the availability of plagiarized material and "ready-made information" via ChatGPT could compromise academic integrity and diminish inquiry, creativity, and critical thinking skills.

> "In this ChatGPT application we just ask the question and it gives us the answer. This limits our research skills a lot…For example, we read the assignments and questions given to us from Google Scholar, we search for different articles. While researching that question, we also learn different things. But if we ask directly to the application, we will have a very lazy brain, [a brain] that will want to find the answer directly." (P18)

Likewise, they highlighted the risk of students' excessive dependence on ChatGPT, which may diminish inquiry skills, curiosity, and self-assurance. ChatGPT may therefore limit the cognitive developmental trajectory of PMTs and their future students by depriving them of developing rigorous research skills, perseverance and discovery experiences, and, as noted, unintended learning.

Aspirations to Use for Mathematics Teacher Education (MTE)

Through exploration of the capabilities of ChatGPT, some PMTs expressed *aspirations for integrative ICT*. Several PMTs requested information on using more ICTs for enhancing university education and teaching practices. Queries were also made to ChatGPT regarding suitable websites, software, and resources for teaching mathematics efficiently. These PMTs have already completed courses on 'Information Technology' and 'Instructional Technologies'. Therefore, ChatGPT's user-friendliness and apparent benefits might have augmented their readiness to incorporate useful ICTs in mathematics teaching and learning.

One aspect of ChatGPT that can enhance PMTs' learning is rapid information access for *self-regulatory learning and studying strategies*. Certain PMTs reported that ChatGPT offers effective information on subjects and resources that they have limited access to. The majority of the PMTs emphasized their intention to use ChatGPT for the self-regulation of their learning. For example, they intend to employ it for time management: to learn time management skills while studying and to reduce the time spent on research for their assignments and learning. Multiple PMTs asked questions similar to "How can I study efficiently?" (P13). In addition, they expressed interest to use ChatGPT for challenging college-level courses. The intentions of using ChatGPT in a math teacher training program highlight challenges encountered by the PMTs. PMTs show interest in addressing test anxiety, improving focus, managing stress, enhancing creativity, and developing communication and social skills to gain social support.

While many PMTs expressed interest in utilizing ChatGPT to receive *assistance with MTE courses and assignments* (e.g., developing activities, creating learning materials, constructing presentations, researching concepts, and translating assignment-related texts), misuse of the tool could undermine academic integrity. Although some students intended to gain ideas for organizing assignment content, others indicated their desire to use the information directly. Moreover, the PMTs expressed their interest in obtaining summary information about challenging topics, course content, and relevant books and articles as a shortcut to grasping the core information of their research resources. One PMT stated that "In my university life, I can use it to get deep explanatory and summarized information to understand the terms, applications, topics that professors deliver but I have difficulty understanding" (P17). Taking university-level mathematics courses, such as Analysis (Calculus), Linear Algebra, Abstract Algebra, and Analytic Geometry, are mandatory for the PMTs and present a significant challenge even for pre-service math teachers. The PMTs have expressed a desire to use ChatGPT for gaining conceptual understanding of advanced mathematical concepts, justifying and proving formulas and theorems, solving advanced math questions, double-checking their solutions, and preparing for their exams. Additionally, the PMTs have expressed their desire to utilize ChatGPT for pedagogical courses to develop presentation content and gain a deeper understanding of pedagogical concepts and theories.

One of the most unexpected results was the PMTs' desire to utilize ChatGPT in *forming their teacher identity*. The PMTs asked questions about techniques for self-motivation in learning, with three posing nearly identical queries, such as "How can motivation be maintained and increased during my academic education?" (P4) Some PMTs have raised concerns about connecting the content of courses to real-life situations. The purpose and applications of such courses have been brought into question. In particular, the usefulness of college-level math courses (especially, Analysis and Algebra) has been questioned. Some PMTs were uncertain about receiving sufficient education and training, and asked questions to justify the mathematics teacher education programs: "Will the education I receive at campus be enough for me to reach an adequate level of teaching?" (P15)

Some PMTs also asked about improving their teaching competency, requesting recommendations for pedagogical books and ways to become a better math teacher. Data were collected from sophomore and junior PMTs at the end of the academic year. The participants were on the cusp of becoming juniors and seniors. They had completed multiple pedagogical courses, including "Principles and Methods of Teaching," "Mathematics Teaching and Learning Methods," "Developing Activities in Teaching Mathematics," and "Middle School Mathematics Curriculum." Throughout these courses, the students occasionally engaged in microteaching and presentations. Nevertheless, according to the findings, the PMTs had not developed a foundation for teacher identity and they turned to ChatGPT for further motivational support to establish it.

The PMTs were also aspired to utilize ChatGPT to gather information about various *career goals* including available scholarships, teaching appointments, job prospects, studying abroad, graduate education, and paths to academic careers.

> "Another question I asked to the application was: 'As a person studying elementary mathematics, is there a possibility that I can study abroad?' The answer to this question given by the application was both uplifting and informative. It told me what I should actually do in bullet points. And even though it gave detailed information, it said that I could get the best details from the embassy and consulate." (P9)

This kind of nuanced information may not be easily accessible to every PMT and they may perceive these opportunities as unreachable. Thus, this feature of ChatGPT can contribute to equality of opportunity as well.

Aspirations to use for Prospective Teaching

The PMTs indicated their aspirations for curriculum content development including creating targeted questions and activities, encompassing contextual issues, curriculum-aligned questions, concrete examples to teach abstract concepts, and consciousness-raising questions related to global issues and social injustices. Consequently, most PMTs aimed to use ChatGPT to bridge the gap between abstract mathematical concepts and real-life. They also planned to create general, extracurricular and game-based mathematics activities. One PMT expressed, "I would like to use it to get ideas about activities I can do and how to implement them in different topics to make students love math more." (P20) Similar findings demonstrate that the PMTs did not feel competent in creating real-life examples and engaging activities that motivate students to engage with mathematical problems. Furthermore, the PMTs aimed to utilize ChatGPT for various purposes in their future teaching such as creating special curriculum materials and content that i) takes individual differences into account, ii) compares curricula across multiple countries and cultures, iii) assists in teaching inclusively, and iv) provides concrete examples of abstract mathematical concepts.

The PMTs' interest in using ChatGPT for future teaching was generally based on their goal of acquiring effective teaching strategies, developing lesson planning and classroom management methods, and implementing equitable teaching strategies. The PMTs specifically sought subject-specific effective teaching methods and strategies when it comes to mathematics topics. The PMTs expressed their aspiration to benefit from ChatGPT to anticipate possible student misconceptions and adjust their teaching accordingly. They were also interested in using it for classroom management, effective communication with students, lesson planning, and time management.

Some PMTs understood the importance of equitable teaching techniques for inclusive education. This awareness might be the result of completing the "Inclusive Education in Teaching Mathematics" course or recalling the practice task. Therefore, most PMTs expressed their interest in developing inclusive teaching strategies to aid students with disabilities, meet their requirements, and enhance their learning experience with adaptive teaching methods.

> "I especially think that the strategies it will suggest will contribute to my teaching of students with special needs because I may have many students with hearing impairment, autism, attention deficit [hyperactivity disorder], etc." (P24)

Development and implementation of effective assessment is often overlooked by many in-service teachers, who tend to focus on preparing students for high-stakes exams and tailoring their assessments to those exams. The PMT's goal of utilizing ChatGPT for assessment involved creating routine homework assignments, project assignments, performance assessments, and expanding their knowledge of other effective assessment strategies. For example, a participant in the study mentioned, "I will benefit more in my teaching because it will be very useful in assigning various project assignments and preparing [their] instructions" (P25). These PMTs were informed about these assessment methods; however, their desire to learn more about the preparation of these types of assessment methods indicates a gap in their practical skills for applying theoretical assessment knowledge. The PMTs did not discuss ChatGPT's capacity to monitor student progress and request suggestions for adjusting instruction and content to meet their needs. For instance, inputting specific students' learning styles, interests, motivation, and social interactions into ChatGPT can provide recommendations on appropriate adjustments in teaching to enhance their learning of mathematics. Nevertheless, ChatGPT's responses should be viewed as timely guidance and rapid solutions that should be implemented only after being justified by the literature's findings, as the application is prone to generating erroneous outputs.

Most PMTs prioritized students' individual needs, and they intend to use ChatGPT to address students' needs, motivation, engagement and communication in the classroom. They were aspired to adjust their teaching methods to meet individual student's unique needs. To achieve this goal, they aimed to use ChatGPT to gain an understanding of student psychology, find solutions to their problems in social life, recognize their individual learning styles, determine appropriate approaches for their transition to adolescence, and provide timely and relevant personalized feedback. For example, a PMT stated that "Each student is unique and may have different learning needs. So, I think it will contribute to me by offering different alternatives." (P24)

The PMTs also highlighted the importance of enhancing student motivation through the use of ChatGPT. Numerous PMTs posed inquiries about effective methods to boost student motivation. They anticipated strategies, techniques and activities from the application to draw students' attention to lessons, and increase their curiosity by making learning joyful. They also planned to use ChatGPT for student engagement and enhancing communication in the classroom. Their strategies aimed to develop active learning, enhance student engagement, improve communication between students and teachers, communicate at the student level (including students with special needs), use ChatGPT as a virtual study friend for students, and develop solutions for student issues while collaborating with parents. One PMT asked "How can I keep my students active in the lesson with a student-centered teaching approach, how can I increase their communication with each other?" (P6). The findings and the excerpt suggest that some PMTs might not have been taught in classrooms that met their learning needs, lacked motivation to learn mathematics, and had limited or one-sided communication within the classroom. This can also be related to the extrapolation of some PMTs' low motivation to that of students. However, these aspirations can also be attributed to their awareness of the abstract nature of mathematics and their desire to motivate and engage their future students through conceptual learning with the help of ChatGPT.

Finally, in their forthcoming teaching careers, some PMTs planned to use ChatGPT for their professional development as a tool for enhancing their teaching abilities and integrating new math applications, studying the traits of effective teachers, increasing their mathematics proficiency, and utilizing ChatGPT as a mentor to offer academic assistance to students in their everyday lives.

Discussion

AI rapidly permeates educational settings; nevertheless, the potential benefits of AI have not yet been adequately investigated in pre-service teacher education (Celik et al., 2022) or the K-12 literature (Crompton & Burke, 2022) from an educational perspective (Cope et al., 2021; Zawacki-Richter et al., 2019). Moreover, the capabilities of AI have led to some paradigm-shifting ethical concerns, such as discussions about adopting preventive assessment methods to discourage the increasing exploitation of ChatGPT for academic dishonesty (e.g., Cotton et al., 2023; Cu & Hochman, 2023), misconceptions about the affordances of AI (Antonenko & Abramowitz, 2023), or the spread of misinformation among users. This study provides empirical evidence on these issues related to the PMTs' experiences and intention to use it for their college education and forthcoming teaching career as a supplemental tool. The results also provide insight into their plans for using ChatGPT for assignments at teacher education programs, which could offer opportunities for educators to develop preventive assessment methods. The findings are discussed for ChatGPT-3.5 version.

The findings showed that a fifth of participants had previously used ChatGPT. Similar frequencies were reported in the literature (Cu & Hochman, 2023; Lozano & Fontao, 2023). As student adoption of ChatGPT is growing rather rapidly, this rate might increase. The findings suggest that the PMTs have already begun utilizing ChatGPT for their assignments and education in college-level mathematics and pedagogy classes and they had some concerns about potential changes in learner dispositions because of ChatGPT affordances.

An unequivocal enthusiasm was found among PMTs about the affordances of ChatGPT. Positive perceptions for the affordances of ChatGPT were reported by pre-service teachers of primary education (Lozano & Fontao, 2023) and this perceived satisfaction of interacting with generative AI does not differ based on the level of prior knowledge (Saiz-Manzanares et al., 2023) including earlier exposure to the ChatGPT. PMTs' awareness of ChatGPT's user-friendly features that motivates and support their learning (Shoufan, 2023) through efficient access to information, along with their overall satisfaction with the diverse and comprehensive responses, as well as its multi-purpose use and the capability of providing multiple perspectives, which can reduce their effort and cognitive load in learning and completing complex tasks, were the source of their enthusiasm. This enthusiasm may arise from ChatGPT's quick retrieval of answers to their questions, which relieves their mental workload and allows them to pay more attention to understanding, interpreting, and integrating information. In the literature, multipurpose use and the capability of offering multiple perspectives of AI were either reported as a challenge (Celik et al., 2022) or failed to be included in their model (i.e., CHISM model, Belda-Medina & Kokošková, 2023). This feature of ChatGPT (i.e., multipurpose use and multiple perspectives) has the potential to inculcate critical thinking dispositions in PMTs. Moreover, even though the PMTs found ChatGPT's responses to be more informative and comprehensive than those provided by an educator, an experimental study found optimal benefits from the combination of AI and instructors (Essel et al., 2022). The implications of this finding highlight the need for more productive and sophisticated communication between PMTs and educators.

The PMTs' dissatisfactory experiences with certain technical features of ChatGPT and their perception of potential ethical concerns are significant. The imprecise accuracy of responses produced by ChatGPT, as found in other studies (e.g., Shoufan, 2023), was realized that may potentially disseminate misinformation regarding mathematical operations, pedagogical content knowledge and teaching methods. Moreover, the risk of overestimating ChatGPT's capabilities and relying heavily on it for assignments could exacerbate the issue of cheating on assignments that hinder academic integrity and creativity (Cope et al., 2021; Pavlik, 2023; Popenici & Kerr, 2017). Precautionary measures should be taken to identify AI-generated submission in coursework (For more efficient strategies to detect and prevent plagiarism with various assessment designs, see Cotton et al., 2023). Additionally, PMTs' dependency on ChatGPT can prevent higher-order learning (Farrokhnia et al., 2023) through lessened conventional research and investigative methods, leading to reduced enthusiasm for thorough examination and critical analysis, lessened inquisitiveness and emotional engagement in the learning process, and decreased self-directed learning due to the diminished independent learning behaviors (Lozano & Fontao, 2023; Shoufan, 2023). However, because of the affordances of ChatGPT to pre-service and in-service teachers and easy access to it, a completely prohibitive approach to the use of ChatGPT at higher education institutions is practically not feasible. Educators in higher education must clearly define ChatGPT's role as an assistive tool, not a replacement for traditional research and inquiry methods to ensure a balance between ChatGPT's benefits and maintaining students' skills and participation.

Research on pre-service teachers and in-service teachers' knowledge of AI-based tools in education is limited (Celik et al., 2022; Kim et al., 2021). Teachers generally benefit more from AI when they possess knowledge of its beneficial features and usage (Celik, 2023). Following their exposure to the positive affordances of generative AI, the PMTs showed increased interest in ChatGPT and other ICTs that could support their teaching and learning abilities at the university. Aside from pedagogical content knowledge, the teaching profession requires affective personality traits such as tolerance and compassion for equitable teaching, commitment and passion for teaching, resilience in the face of difficulties (Hotaman, 2010), and a sense of professionalism. Teacher identity is shaped by these non-cognitive factors. Therefore, it is imperative that teacher education programs prioritize the development of a strong teaching identity for prospective teachers as the PMTs aimed to fill this gap by using ChatGPT. However, ChatGPT provides no evidence for its outputs (Cooper, 2023), and most of the time it fabricates false links for ghost bibliographic references in its output (Orduña-Malea & Cabezas-Clavijo, 2023). Its outputs are based on argumentum ad populum, meaning that instead of justifying its responses with evidence, it constructs arguments based on what is most argued or repeated in its trained data. As pre-service and in-service teachers are more susceptible to misinformation through AI due to lack of knowledge (Antonenko & Abramovitz, 2023), to protect PMTs and in-service teachers from potential misinformation, interventions and professional development trainings that include critical comparison of ChatGPT output with scientifically based counter-examples can be implemented.

The PMTs intend to utilize ChatGPT for adapting and organizing math curriculum in their prospective teaching. This involves creating content like real-world examples, activities, and assignments for abstract mathematical concepts. It also includes inclusive teaching methods for special needs students, instructional strategies, and assessment techniques such as project proposals and performance-based assessments. Some of these recommendations are consistent with systematic reviews (i.e., Celik et al., 2022; Crompton & Burke, 2022); however, the studies in these reviews did not incorporate AI tools to assist in the creation of inclusive instructional designs that could help address individual student needs. Similarly, ChatGPT can generate ideas, classroom examples, and activities to equip pre-service teachers to effectively enact social justice pedagogy (DeMink-Carthew, 2018) for underrepresented students. The PMTs aimed to use ChatGPT to assist students with unique learning needs due to their lack of experience. The recognition of the importance of inclusive instructional strategies by PMTs may have stemmed from practice tasks activities. However, because the sample activities did not include questions about collaborative learning or data-driven decision making, which were highlighted in the previous systematic reviews (i.e., Celik et al., 2022; Crompton & Burke, 2022), the PMTs did not express their intention to use ChatGPT to incorporate these aspects into their prospective teaching. This realization highlights the need for careful planning when training PMTs on AI tools, such as ChatGPT.

The PMTs emphasized using ChatGPT for student motivation strategies. They anticipated the application to enhance engagement, communication, and understanding of student psychology. The PMTs also expected it to help solve real-life math problems, identify learning styles, and provide timely feedback for students transitioning to adolescence. By generating immediate feedback, AI can facilitate student learning progression by reducing delays in teacher feedback (Chen et al., 2023; Goel & Joyner, 2017). It should be noted that the study sample experienced COVID-19 pandemic restrictions and they are survivors of Mw 7.7 and 7.6 earthquakes that hit the southeastern regions of Türkiye in February 2023. It is possible that they might prioritized their need for motivation and self-regulation because of their conditions.

Further research is needed to uncover i) pre-service teachers' ICT literacy to responsibly use AI tools in their learning and teaching by considering their potential positive and negative outcomes, ii) effective strategies to prevent cheating through AI tools, iii) development of specific ethical guidelines for integrating AI tools in teacher education programs, iv) long-term impact of AI tools on pre-service teachers' learning dispositions using longitudinal data that focuses on PMTs' performance and behaviors, v) the best practices for integrating AI tools such as ChatGPT in teacher education programs that can enhance PMTs' essential thinking and learning (e.g., creativity, analytical and critical thinking, and data-driven decision-making), teaching (e.g., inclusive and culturally relevant instruction), and assessment skills.

Conclusion

The rapid evolution of AI technologies and their planned and unplanned penetration into educational settings requires careful examination, preparation, and action to prepare teachers for this changing educational landscape. The PMCA generated by this study contribute to the literature and teacher education programs, which can serve as a tentative theoretical template, by providing a more comprehensive and unexplored intentions of PMTs to use ChatGPT for their education and future teaching. As a free and easily accessible alternative to contract cheating, ChatGPT is a difficult challenge for educators in teacher education programs and in-service teachers. Although some available software can detect AI-generated content to some extent (e.g., Scribbr's AI detector, Turnitin, ChatZero and Isgen), PMTs and students can discover loopholes to avoid the detection. Further research, data-driven discussions and preventive policy measures regarding the spread of misinformation through ChatGPT in teacher preparation programs are also urgently needed. Nevertheless, in our ever-evolving dynamic environment, where finding plausible answers, sometimes under the pressure of deadlines or the need for quick decision-making, and finding effective ways to communicate with students as well as providing culturally appropriate communication via AI can benefit teachers and pre-service teachers (Blanchard, 2015; Farrokhina et al., 2023; Lozano & Fontao, 2023). PMTs can consult ChatGPT and other resourceful AI applications for assistance, while being informed of their limitations.

APPENDIX 1

Introductory Practice Task for ChatGPT

Preparation of Course Content/Assignments:

- Prepare a 7th grade performance homework question about solving equations that can be related to real life.
- I will take my 6th grade students to the Archaeology Museum for an out-of-school field trip. The topics we have covered this semester are: factors and multiples, sets, whole numbers and operations with fractions. Which questions can I ask during the museum visit to help students reinforce these topics?
- I am going to teach probability to 8th graders in math class. I want to give a project-based assignment. Write a project idea that can be solved in several steps and write [homework] instructions that I can give to the students.

- I will teach my 6th grade students to gain the objective 'Construct the area relation of a triangle and solve related problems.' Create a question [related to this objective] that will raise awareness in students about global problems and social justice concepts.

Approaches to Inclusion Students:

- In my 7th grade class, there is a student with Attention Deficit Hyperactivity Disorder (or hearing impaired, autistic, exposed to domestic violence, etc.). How should I orient my teaching for this student?
- I have students in my class who do not speak Turkish well. What can I do to increase their participation in math class?

Helping Students:

- How do I solve the equation 3x - 15 = 4x + 20?
- In 8th grade math class, I didn't understand the difference between the concepts of statistics and parameter. what is it?
- (Follow-up question) I don't understand the parameter. Can you explain it in a simpler way?
- Solve the equation ((2^3)^5)/16

APPENDIX 2

Online Interview Questions:

1. Have you used ChatGPT before? If yes, for what purpose?
2. What do you think about the application?
3. Did you encounter any technical problems while using ChatGPT? Do you think the answers given to the questions are correct and sufficient?
4. Answers to which questions do you think would contribute more to your academic knowledge or future teaching?
5. In which areas do you intend to use ChatGPT in your university life or in your teaching?
6. Asking which questions other than the ones mentioned here (in Introductory Task) can contribute to your learning, your professional development as a teacher and to improve your teaching approach?
7. Write down 5 questions about your academic life that you are curious about.

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Article History
Received: 17.04.2024
Accepted: 26.06.2024
Available online: 30.06.2024
Article Type: Research Article

"ADIYAMAN UNIVERSITY
Journal of Educational Sciences
(AUJES)"

"https://dergipark.org.tr/tr/pub/adyuebd"

Examining the Opinions of Prospective Mathematics Teachers on Sociomathematical Norms

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To cite this article:
Gülburun, M. (2024). Examining the opinions of prospective mathematics teachers on sociomathematical norms. *Adiyaman Univesity Journal of Educational Sciences, 14*(1), 36-46.

Adiyaman University Journal of Educational Sciences

Volume 14, Number 1 , June 2024, Page 36-46 ISSN: 2149-2727
DOI: http://dx.doi.org/10.17984/adyuebd.1469981

Examining the Opinions of Prospective Mathematics Teachers on Sociomathematical Norms

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Abstract

The aim of the study is to examine prospective mathematics teachers' opinions regarding the definition of sociomathematical norms, the factors (variables) that are effective in the establishment of sociomathematical norms, and the negotiation of sociomathematical norms. This study was conducted with 10 prospective teachers in the primary school mathematics teaching undergraduate program of a state university located in the Mediterranean Region of Türkiye. The participants of the study, in which the special case approach was adopted, were prospective mathematics teachers in the course on "Sociomathematical Norms in Mathematics Teaching". The data were collected through semi-structured interviews and classified under certain categories with content analysis. The results showed that prospective mathematics teachers defined sociomathematical norms according to individual (such as attitudes and beliefs) and social (such as rules, obligations, and expectations) perspectives. In addition, prospective mathematics teachers stated that sociomathematical norms are directly affected by factors such as students, teachers and classroom atmosphere, and indirectly by factors such as family and school. Finally, prospective mathematics teachers emphasized that the negotiation of sociomathematical norms can provide opportunities in terms of learning (skills and autonomy), teaching (participation and intervention) and management (communication and control). In this context, taking into consideration the opinions of prospective mathematics teachers regarding sociomathematical norms is valuable in terms of increasing the efficiency of mathematics applications.

Keywords: Primary school mathematics teaching, Prospective mathematics teachers, Sociomathematical norms, Opinions

Introduction

Norms regulate patterns of interaction in the classroom microculture. In other words, it is a grammatical system that governs the actions and discourse of class members. In this context, the normatives of class members' discussions specific to mathematical applications can be expressed as sociomathematical norms (such as what is mathematically different, efficient or sophisticated). The discovery of sociomathematical norms has been an important turning point in mathematics teaching (Levenson et al., 2009). As a matter of fact, the European Mathematics Committee has claimed sociomathematical norms as one of the seminal findings in mathematics teaching. It also stated that sociomathematical norms can provide effective and valid understandings in structuring learning/teaching in the mathematics classroom (Partanen, 2011). Therefore, examining how sociomathematical norms, which are an important component of the mathematics classroom microculture, are defined by class members is valuable in terms of the efficiency of mathematics teaching.

With sociomathematical norms beginning to become the focal point (Toscano et al., 2019), the number of researches increased. While some of the studies examine how sociomathematical norms are established (Güven & Dede, 2017; Dixon et al., 2009), others focus on the role of the teacher in establishing them (Kang & Kim, 2016; Tatsis & Koleza, 2008). Similarly, while some studies have focused on the conservation of sociomathematical norms (Sekiguchi, 2005), some others have examined the relationship between the negotiation of sociomathematical norms and conversations (Gorgorio & Planas, 2005). Negotiation of sociomathematical norms is an endeavor to reach a common point. In other words, it means establishing mathematical validity criteria in classroom discussions (Author). By negotiating sociomathematical norms, class members can compare proposed ideas and gain insight into which is valid. In this context, negotiation of sociomathematical norms can be used as an effective tool to disclose mathematical opportunities. However, almost all of the above studies assessed sociomathematical norms using didactic approaches (for how to teach mathematics better rather than how to learn mathematics better). This situation can be considered a limiting factor in our understanding of how the negotiation of sociomathematical norms is perceived by class members. Therefore, it is important to analyze

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what class members consider regarding the negotiation of sociomathematical norms in order to better understand the impact of actions/discourses on the classroom microculture.

Those responsible for learning/teaching based on the interaction between class members have an active role in the establishment and development of norms in the classroom (Partanen & Kaasila, 2015). However, Levenson et al. (2009) mentioned that the sociomathematical norms in endorse in the classroom may be different from the sociomathematical norms that are tried to be put into enact. This brings new responsibilities to teachers, prospective teachers and educators. Pedagogical knowledge and skills that promote the realization of these responsibilities have an important place in undergraduate education. In this context, opinions about what affects sociomathematical norms are also valuable in terms of testing the validity of existing pedagogical knowledge and allowing us to understand its working principles. Therefore, considering that the perspectives of prospective teachers throughout their undergraduate education represent their professional development and practices, it can be said that their views on norms will also be effective in structuring the classroom microculture. In this context, the opinions of prospective mathematics teachers at the beginning of their teaching careers regarding sociomathematical norms are valuable for the teaching that will take place in mathematics courses. According to the phenomenological perspective claims those experiences modify human behavior and that behavior is modified according to desires, beliefs and/or perceptions. The perspective also advocates people who experience similar phenomena establish different meaning. In this context, individuals' past experiences are as significant as their current experiences. Therefore, it may be important to consider characteristics such as gender, grade and field of graduation when evaluating the opinions of prospective primary school mathematics teacher regarding sociomathematical norms. In addition, there is a need for exhaustive information about each classroom microculture, starting from the basic steps in the mathematics teaching (Yackel & Cobb, 1996). This could be achieved by understanding the views on the norms of microcultures, especially in primary school mathematics classes. Therefore, analyzing the perspectives on what may affect the sociomathematical norms of primary school mathematics classes that focus on understanding and try to develop higher-order thinking skills will support the field in new ways.

In line with the explanations above, the problem of this study is to investigate the opinions of prospective primary school mathematics teacher regarding sociomathematical norms. Although sociomathematical norms demonstrate themselves in discussions conducted in classrooms, opinions of teachers or prospective teachers who lead these discussions will contribute to the understanding of sociomathematical norms. In this context, purpose of the study is to clear the thoughts of prospective primary school mathematics teachers considering the nature of sociomathematical norms, the factors affecting sociomathematical norms, and the effects of negotiating sociomathematical norms.

Method

In this study, since the opinions of prospective primary school mathematics teachers considering sociomathematical norms were analyzed in detail, a special case study was preferred among the qualitative research approaches. In addition, the study was designed as an internal case study (Yıldırım & Simsek, 2011) in order to understand more comprehensively the opinions of prospective mathematics teacher regarding the definition of sociomathematical norms, the factors influencing sociomathematical norms, and the effects of negotiating sociomathematical norms. The purpose of the internal case study is to analyze a specific group in a multifaceted, systematic and comprehensive way, rather than developing general theories or making generalizations to a larger sample (Baxter & Jack, 2008).

Participants

The study was conducted with 10 prospective teacher in the primary school mathematics teaching. T1, T2, T3... T10 were used to designate participants in order to keep their identities confidential. 7 of the participants were female and 3 male, 1 was a senior student, 4 were 3rd graders, and the remaining were 2nd graders. In addition, 7 of the participants graduated from high school in the field of mathematics-science and 3 of them graduated from the field of literature-mathematics (see Table 1). In the field of mathematics-science, individuals engaged in higher-level mathematical skills (algebra, proof, etc.), while in the field of literature-mathematics, they focused on basic skills (arithmetic, etc.).

Table 1. Characteristics of participants

Participants	Gender	Grade	High school graduation
T1	Female	4	Mathematics-Science
T2	Female	2	Mathematics-Science
T3	Male	2	Mathematics-Science
T4	Female	2	Mathematics-Science
T5	Female	3	Mathematics-Science

T6	Male	2	Mathematics-Science
T7	Male	3	Literature-Mathematics
T8	Female	3	Literature-Mathematics
T9	Female	3	Literature-Mathematics
T10	Female	2	Mathematics-Science

In the study where the purposeful sampling method was preferred, the participants consisted of prospective teachers in the course on "Sociomathematical Norms in Mathematics Teaching (SNMT)". The content of SNMT incorporated theoretical foundations of sociocultural approaches, components of mathematics classroom microculture, establish/negotiation of sociomathematical norms, and characteristics of sociomathematical norms according to grades. Detailed information about the week, duration and content of the course are presented in Table 2. The instructor of the course conducted longitudinal studies on sociomathematical norms and experienced in teaching the course.

Table 2. Week, duration and content information of SNMT

Week	Duration	Content
1-4	(8x40 minutes)	•Explains the significance, arguments and historical development of sociocultural approaches in mathematics education. •Explains the reflections of symbolic interactionism on mathematics education. •Explains the reflections of ethnomethodology on mathematics education. • Explains the reflections of phenomenology on mathematics education. • Explains the reflections of constructivism on mathematics education.
5-8	(8x40 minutes)	•Explain the interpretive framework • Explains the significance of social norms in terms of classroom microculture •Explains the significance and negotiation of sociomathematical norms • Explains the significance of mathematical practices in classrooms regarding teaching mathematics.
9-12	(8x40 minutes)	•Explains the establisment of sociomathematical norms • Explains the factors affecting the establisment of sociomathematical norms • Explains the negotiation process of sociomathematical norms • Explains the relationship of negotiations to learning opportunities
13-14	(4x40 minutes)	• Explains the normatives adopted in primary school mathematics teaching. • Explains the characteristics and negotiation of sociomathematical norms in secondary school

Data Collection

In the study, a semi-structured interview form consisting of five open-ended questions was used to determine the opinions of prospective mathematics teachers regarding sociomathematical norms. The questions in the interview form were analyed and their convenience was assessed by two experts in the field. Initially, seven open-ended questions were created, but two questions were removed from the interview form in line with the suggestions of experts. Some questions were corrected to reflect a complete meaning. Later, interviews were conducted with three prospective mathematics teachers who were not included in the study to test whether the prepared questions were understandable.

The first question targets understanding how the prospective mathematics teachers perceive and define sociomathematical norms, the second question targets understanding how the factors affecting sociomathematical norms are assessed, and the last three questions target understanding the participants' evaluations of the negotiation of sociomathematical norms. Questions in the interview form;

1. What is the sociomathematical norm according to you (How would you define the sociomathematical norm)? Explain

2. Which factors affect sociomathematical norms? Explain.

3. What effects does negotiation of sociomathematical norms have for the teacher, students, classroom microculture, and mathematics learning/teaching? Explain.

4. Do you think sociomathematical norms are/will be effective in your own professional development? Explain.

5. What king of pedagogical additions the course(s) you took in undergraduate studies make to sociomathematical norms?

At the end of the 14-week course, face-to-face interviews were held with each student. Before the main interview, preliminary interviews were organized with prospective primary mathematics teachers, they were informed about the purposes of the study, and the appropriate day and time were decided. Each interview lasted 25-35 minutes and was conducted in person. The interviews were also recorded with a voice recorder and notes were taken.

Data analysis

The data collected in the study was analyzed using the content analysis method. In this process, first the data must be encoded. Then, categories that best explain these codes are created and the data must be organized and interpreted according to these categories (Yıldırım & Simsek, 2011). The answers to each question asked to the participants were examined comprehensively. Each response was reviewed and inductive analysis was applied during the analysis process. This method offers an important advantage and convenience for organizing qualitative data. During the coding process, certain words or sentences were used to describe and separate the data into meaningful sections. Categories were formed based on the common features of the obtained codes.This can be used to separate codes into categories that can describe them at a general level. An expert mathematics educator accompanied the coding of the data. In order to resolve disagreements in the codes and achieve consensus, differences between the codes were discussed and the approved codes were included in the study. The formula (reliability=consensus/(consensus+disagreement)) developed by Miles and Huberman (1994) guarantees the reliability of coding. The coding reliability made by the coders independent of each other was 0.92. Since it is recommended to quote data directly in qualitative research for the reliability of the study (Yin, 2011), some opinions of the participants were directly reflected in the study.

Ethics approval

The ethics committee approval of this study was granted by Mersin University Social and Human Sciences Ethics Committee with the decision dated 31.12.2023 and numbered 323.

Results

The results are presented as opinions on the definition/nature of sociomathematical norms, opinions on the factors affecting sociomathematical norms and opinions on the negotiation of sociomathematical norms.

Opinions on the Definition/Nature of Sociomathematical Norms

This section includes the opinions of prospective primary school mathematics teachers regarding what sociomathematical norms are. The codes and categories resulting from the analyses are presented in Table 3.

Table 3. Codes and categories related to the definition/nature of sociomathematical norms

Participants	Codes	Subcategories	Categories
T9, T7, T8	Reactions related to mathematics	Attitudes	Individual perspective
T7	Beliefs about mathematics	Beliefs	
T1, T2, T3, T10	Mathematical procedures	Rules	Social perspective
T4	Things to do about mathematics	Obligations	
T6, T2	Things to do not about mathematics		
T5, T9	Requests from each other about mathematics	Expectations	

The opinions of prospective mathematics teacher regarding the nature of sociomathematical norms and what they are were separated into two categories: individual and social perspectives. In the individual perspective category, two subcategories were determined as attitudes and beliefs. In the attitudes subcategory, participants defined sociomathematical norms as the reactions of the person regarding mathematics. Sample statements are presented below;

T9; “I think mathematics has a unique structure, for example, when solving a problem, I first model it by visualizing… Sociomathematical norms like these are our reactions to mathematics…”

T8; “They are the reactions that occur when a person does mathematics.”

The other subcategory that comes forward in the individual perspective category is belief. In this subcategory, it was observed that the participants assessed sociomathematical norms as beliefs that individuals have about mathematics. Sample statements of the participants were presented below;

T7; “Sociomathematical norms are the beliefs that individuals have about the nature of mathematics, such as associating mathematical concepts with real life… Because, in fact, mathematics emerged from real life.”

It was determined that the statements in the subcategories of attitude and belief were made by prospective teachers who graduated from literature-mathematics in high school. This demonstrated that prospective teachers' perspectives on the sociomathematical norms of the high school field they graduated from are decisive. As a matter of fact, prospective teachers who graduated from literature-mathematics in high school mostly assessed sociomathematical norms from the individual perspective.

Another category that emerged regarding what sociomathematical norms are is the social perspective. This category includes three subcategories: rules, obligations and expectations. In the rules subcategory, participants represented sociomathematical norms as jointly established procedures within the classroom. Sample statements of the participants are presented below;

T1; “They are mathematical rules that are applied in the classroom with or without the influence of the teacher. When finding the percentage of a number, it's like dividing by the denominator and then multiplying by the numerator..."

T3; “When I think of sociomathematical norms, I think of the procedures accepted by everyone regarding mathematics. Everyone knows that the operations with parentheses should be done first in the operation priority…”

T10; “…are unwritten common rules in mathematics teaching.”

Prospective mathematics teachers who expressed their opinions in this category graduated from mathematics-science in high school and interpreted the norms as rules related to mathematics, in other words, actions.

In the obligation subcategory, prospective mathematics teachers described sociomathematical norms as obligatory situations that class members establish together and that everyone must or must not comply with. Additionally, the participants stated that these obligatory situations should be taken into consideration. Sample statements of the participants are presented below;

T4; “When we say sociomathematical norms, what comes to my mind is obligations that we have developed during mathematics activities in the classroom and that we must (not) comply with… Everyone should pay attention to these obligations to make mathematics more understandable. Because everyone is in this class for the same purpose.”

T6; “Sociomathematical norms are obligations established by the teacher and the students, without realizing it, through mathematics…”

The prospective mathematics teachers who expressed their opinions in this subcategory were studying in the lower grades. This situation demonstrated that prospective primary school mathematics teachers perceive sociomathematical norms as a requirement in the early stages of their pedagogical education.

In the expectations subcategory, participants generally defined sociomathematical norms as the mutual wishes or expectations of class members. The statements of the participants who expressed their opinions in this category are presented below;

T5; “I can define it as something that the teacher expects from the students in the classroom. In other words, they are requests related to mathematics… Such as the teacher asking the students to explain the solution or provide a justification…”

T9; “…are mutual expectations about mathematics. What do students actually expect from teacher? The teacher can think about this. Do I teach mathematics in accordance with the students' wishes? Am I providing the classroom environment they want? Likewise, what do teacher expect us to do for students? They can think about it. Of course, as a result of this, if everyone clearly understands each other's expectations, this will have a positive impact on doing mathematics, and a better classroom environment will be provided as everyone knows each other's expectations.”

Prospective mathematics teachers who expressed their opinions in this subcategory described sociomathematical norms as expectations. They noted that mutual expectations of class members also affect mathematics learning/teaching in the classroom. Participants with this view were predominantly women. This brings to mind the idea that gender may have an effect on opinions about what sociomathematical norms are.

Opinions on the Factors Affecting Sociomathematical Norms

This section includes the opinions of prospective primary school mathematics teachers regarding the factors affecting sociomathematical norms. The codes and categories obtained as a result of the analyzes are shown in Table 4.

Table 4. Codes and categories related to the factors affecting sociomathematical norms

Participants	Codes	Subcategories	Categories
T7, T10	Mathematics learning style	Student	Direct
T6, T7, T8	Mathematics readiness		
T1, T9	Teaching method	Teacher	
T5	Perspective on mathematics		
T5, T9	Professional development/undergraduate education		
T1, T7	Physical facilities of the classroom	Classroom atmosphere	
T3, T5	Interaction in the classroom		
T2	Socioeconomic status	Family	Indirect
T4	Cultural structure at school	School	

When the opinions of prospective mathematics teachers regarding the factors affecting sociomathematical norms were analyzed, two categories were named: direct and indirect effects. In the direct category, three subcategories were observed: student, teacher and classroom atmosphere. In the student subcategory, participants emphasized learning style and readiness. Sample statements are presented below;

T6; "Student's mathematical experiences affect the norms; for example, students whose learning style is operational may adopt more behavioral/symbolic norms than conceptual ones…"

T7; "…students with good readiness contribute more to the formation of norms…"

Participants noted that teacher was another factor affecting sociomathematical norms. They mentioned that the teacher's understanding of teaching, his perspective on mathematics, and his professional pedagogical education directly affect sociomathematical norms. Sample statements of the participants are presented below;

T1; "The teacher's perspective on mathematics, for example, mathematical conversations in classrooms where teacher-centered teaching and student-centered teaching is carried out, will be different, which will affect sociomathematical norms…"

T5; "I think pedagogical education is very effective... For example, algebra is a subject that students have difficulty with. In general, they have difficulties, but we had seen the sociomathematical norms that came to the fore in undergraduate education and affected students' learning, so we had the opportunity to see in the course why and how students do something in teaching algebra. Seeing these in undergraduate education will affect the sociomathematical norms in our own classrooms. In this context, I think that courses on sociomathematical norms should be compulsory rather than elective in undergraduate education."

T9; "Each teacher may care about different things. For example, some may care about the strategies and solutions developed for the problem, while others may only care about whether the answer to the question is correct or not; such understandings can pave the way for the development of different sociomathematical norms in the classroom..."

The statements in this subcategory were expressed by prospective teachers in upper grades. This demonstrated that prospective primary mathematics teachers in the upper grades assessed the factors affecting sociomathematical norms in the context of teachers and teaching, and that they had the opinion that pedagogical (undergraduate) education was more effective on sociomathematical norms.

Another subcategory within the direct category was classroom atmosphere. Participants generally stated that the interaction design in the classroom, class size, or physical equipment such as materials were effective on sociomathematical norms. Sample statements of the participants are presented below;

T1; "sometimes class size or lack of materials can limit the mathematical proficiency of class members, which can affect the use of mathematical skills and the nature of sociomathematical norms in the classroom…"

T3; “The way students interact with each other or with the teacher has an impact on sociomathematical norms.”

T5; “The impact students have on their peers can be significant. For example, if someone expresses his mathematical ideas easily, others can also emulate him and express their own mathematical ideas. That's why I think the classroom atmosphere is important.”

T7; “Even the decoration of the classroom can be effective, anything you see in the classroom can affect the discovery of mathematical structure in terms of increasing the student's motivation.”

According to the analysis of the data obtained, another category that affected sociomathematical norms was indirect effects. This category included two subcategories. Sample statements of participants in the family subcategory are presented below;

T2; “I think the family the student lives in can also have an impact on sociomathematical norms. In other words, the family's interest and socioeconomic status are effective on the student's mathematical experience, knowledge, fear, prejudice and understanding..."

In the school subcategory, participants stated that the school's facilities and cultural environment were especially effective on sociomathematical norms. Sample statements are presented below;

T4; "...albeit limited, the sociocultural structure of the school and the relationship between its administrator and teachers indirectly affect sociomathematical norms because the school is a small culture..."

It was determined that the expressions in this category were mostly made by prospective mathematics teachers who were in lower grades. This demonstrates that lower grade prospective primary school mathematics teachers also take into account conditions such as family and school when assessing the factors affecting sociomathematical norms.

Opinions on Negotiation of Sociomathematical Norms

This section includes the opinions of prsopective primary school mathematics teachers regarding the effects of negotiating sociomathematical norms. The codes and categories obtained as a result of the analysis are shown in Table 5.

Table 5. Codes and categories related to the negotiation of sociomathematical norms

Participants	Codes	Subcategories	Categories
T8, T9	Meaningful learning through reasoning	Skills	Opportunities for learning
T7	Permanent learning through association		
T7, T9	Mathematical autonomy	Autonomy	
T3, T5, T6	Promotion of alternative teaching methods Role playing in teacher intervention	Intervention	Opportunities for teaching
T2, T10	Taking responsibility in learning	Participation	
T4, T6	Mathematical communication	Communication	Opportunities for management
T1, T5	Simplifying classroom management through collaboration	Control	

When the opinions of prospective mathematics teachers regarding negotiating sociomathematical norms were analyzed, three categories were identified: opportunities in terms of learning, teaching and management. In the category of opportunities for learning, two subcategories were formed: skills and autonomy. In the skills subcategory, participants noted that negotiations of sociomathematical norms could ensure students achieve meaningful and permanent learning by using skills such as reasoning, verification and association. Sample statements of the participants are presented below;

T7; “Negotiations also have a positive impact on learning. It mostly affects the cognitive level. I think justification improves reasoning further. It makes you think more. It encourages questioning…”

T8; “Thanks to negotiations, verifying or searching for different solutions in mathematics makes learning more permanent...”

T9; “…association and communication skills are especially active in the negotiation process, of course, these skills also improve students' problem-solving skills…”

Another subcategory was autonomy. Sample statements of the participants are presented below;

T9; "Negotiation of sociomathematical norms can provide students with the possibility to present their own mathematics… This also allows them to enjoy mathematics."

The prospective mathematics teachers who expressed their opinions in this category graduated from literature-mathematics in high school and they were in the upper grades. In particular, they pointed out that mathematical skills can emerge through the negotiation of sociomathematical norms.

When the opinions of prospective mathematics teachers regarding the effects of negotiating sociomathematical norms were analyzed, two subcategories were identified in the opportunities for teaching category: intervention and participation. In the intervention subcategory, participants underlined that intervention methods that would support conceptual learning could be put forward through negotiations. Sample statements of the participants are presented below;

T3; "It can give teachers the opportunity to highlight students' ideas that they consider valuable in class discussions. Most of the time, students' valuable mathematical ideas have little chance of being revealed in the classroom, or even if they do, they may not be reciprocated in the classroom. In this context, negotiations of sociomathematical norms provide opportunities for teachers to make interventions that enable conceptual learning..."

T6; "Although different teaching methods are used in mathematics teaching, the teacher may sometimes be inadequate or ineffective in intervention. Therefore, negotiation of sociomathematical norms may give the teacher a chance to detect and intervene in misconceptions. It may provide opportunities during intervention transitions..."

The last subcategory determined in this category was participation. Prospective mathematics teachers stated that negotiating sociomathematics norms would encourage students to assume responsibility for their own learning. Sample statements are presented below;

T2; "In the process of negotiation, students are responsible for their own learning, they listen to their peers, approve or disapprove… Thus, they regulate their own mathematics learning…"

According to the opinions of prospective mathematics teachers, two subcategories were identified in the opportunities of management category: communication and control. In the communication subcategory, participants emphasized the correct use of mathematical symbols. Sample statements of the participants are presented below;

T4; "Sometimes during the negotiation process, class members may attribute features of their own language structures to mathematical symbols, that is, they may not be able to use formal language when expressing mathematics. In this case, the negotiation process may also offer opportunities to transform informal language structures into a more formal structure..."

T6; "For example; Regarding inverse proportion, the expression *parallel multiplication* is a linguistic structure that indicates the inverse proportion between variables. Negotiations may offer opportunities to understand the mathematical relationship between variables (the multiplication of inversely proportional variables are constants)…"

According to the analysis of the data obtained, the last subcategory determined in this category was control. Sample statements are presented below;

T1; "negotiations can contribute to classroom management by increasing cooperation between students…"

T5; "Teachers can gain from better classroom control during the negotiation process."

Prospective mathematics teachers who expressed their opinions in this subcategory noted that negotiations could provide opportunities for classroom management by increasing cooperation between class members.

Discussion, Conclusion and Recommendations

The opinions of prospective primary school mathematics teachers regarding the definition/nature of sociomathematical norms are classified as individual and social perspectives. While the individual perspective represents the values of class members, such as attitudes and beliefs in their participation in mathematics applications, the social perspective represents the collective understandings of what class members agree on, such as rules, obligations, or expectations regarding mathematics applications. In other words, while the individual perspective focuses on the psychological dimension of the classroom microculture, the social perspective focuses on the social dimension. Although sociomathematical norms are common structures of classroom microculture (Partanen & Kaasila, 2015), the results of the current study point to the importance of considering these two

perspectives together in evaluating sociomathematical norms. As a matter of fact, evaluating sociomathematical norms only from an individual perspective or only from a social perspective may limit understanding its nature. According to Bauersfeld et al. (1988), the process of adapting to individual logic in mathematics classrooms cannot be separated from social processes. Yackel and Cobb (1996) pointed out that psychological processes may be inadequate in evaluating the thoughts held or defended by class members and that the assumption that social and psychological factors in the classroom are mutually reflexive. Prospective mathematics teachers' views on sociomathematical norms also showed that individual structures such as attitudes and beliefs can be associated with social structures such as rules, obligations or expectations. Similarly, Cho's (2001) research showed that teachers' beliefs about mathematics affected the negotiation of norms in the classroom. In their study, Kang and Kim (2016) noted that when the teacher selects interactive activities based on his mathematical beliefs in the classroom, it can influce the participation structure of the class.

The prospective mathematics teachers who express their views on what sociomathematical norms are from their individual perspective are mostly those who graduated from literature-mathematics field in high school. The fact that these candidates had little experience with mathematics before undergraduate education may have been effective in their evaluation of sociomathematical norms in this way. Therefore, giving these candidates a theoretical structure regarding the nature of sociomathematical norms, starting from the early stages of their undergraduate education, may be effective for a more comprehensive perspective. In addition, prospective primary school mathematics teachers evaluated sociomathematical norms more from a social perspective. In this category, it was determined that prospective mathematics teachers who graduated from mathematics-science field in high school expressed sociomathematical norms as rules and obligations. In the expectations subcategory, the opinions of female candidates came to the fore. No research was found in the literature on the definition/nature of sociomathematical norms related to variables such as graduation from high school or gender. In this context, investigating these variables related to the definition/nature of sociomathematical norms may be effective in revealing the differences in the thoughts of prospective mathematics teachers.

When the opinions of prospective mathematics teachers regarding the factors affecting sociomathematical norms were examined, three subcategories emerged in the direct category: student, teacher and classroom atmosphere. Prospective mathematics teachers emphasized that the students' readiness and learning style, the teacher's understanding of teaching, his perspective on mathematics and the pedagogical education he has acquired professionally have an impact on sociomathematical norms. The fact that prospective teachers, especially in the upper grades, have such views may be due to the fact that they attach importance to learning and teaching in evaluating the factors affecting sociomathematical norms. As a matter of fact, the literature states that sociomathematical norms should be seen as regulatory elements of teaching (McNeal & Simon, 2000; Pang, 2001). However, lower grade candidates stated that indirect variables such as family and school mostly affect sociomathematical norms. In terms of factors affecting sociomathematical norms, the fact that prospective mathematics teachers who expressed their opinions in the indirect effects category give more value to variables that had indirect effects outside the classroom more showed that they were more anxious and therefore more sensitive to the external factors of the education system. Therefore, this should be taken into consideration in the pedagogical education offered to prospective mathematics teachers regarding sociomathematical norms.

When the opinions of prospective primary school mathematics teachers regarding negotiating sociomathematical norms were examined, categories for opportunities in terms of learning, teaching and management were determined. As a matter of fact, according to Sekiguchi (2005), different norms can offer effective ways to both obtain different learning opportunities and access mathematical concepts. Similarly, Sánchez and García (2014) stated that class members can also affect their own understanding during the process of negotiating norms. In the category of opportunities for learning, two subcategories emerged: skills and autonomy. In the skill subcategory, participants mentioned that negotiations of sociomathematical norms could ensure students achieve meaningful and permanent learning by encouraging them to use skills such as reasoning, verification and association. As a matter of fact, stated that negotiation of norms is effective in shaping class members' beliefs and feelings about mathematics, producing creative solutions, and obtaining learning opportunities to find the similarities/differences of mathematical expressions. In addition, the candidates who expressed their opinions in this category were in the upper grades and graduated from literature-mathematics field in high school. These candidates interpreted negotiations in the context of learning and pointed out that mathematical skills can be revealed especially through the negotiation process. In the opportunities for teaching category, two subcategories were identified: intervention and participation. The candidates who expressed their opinions in this category graduated from mathematics-science field in high school and evaluated the effects of negotiations in the context of teaching. They emphasized that the negotiations would provide intervention opportunities, especially for teachers, that would support conceptual learning (Partanen, 2011) in mathematics teaching. Additionally, prospective teachers stated that negotiating sociomathematical norms would encourage students to assume responsibility of their own learning. In the category of opportunities for management, two subcategories were identified: communication and control. In the communication subcategory, participants stated

that negotiation of sociomathematical norms could support mathematical communication, albeit implicitly. In the control subcategory, they stated that negotiations could provide opportunities for classroom management by increasing cooperation among class members. In this context, designing the structures that constitute the classroom microculture considering the effects of the negotiations of sociomathematical norms specific to mathematics classes and carrying out mathematical applications accordingly can provide productive outcomes in terms of mathematics teaching.

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Article History
Received: 18.03.2024
Accepted: 07.05.2024
Available online: 30.06.2024
Article Type: Review Article

ADIYAMAN UNIVERSITY
Journal of Educational Sciences
(AUJES)

https://dergipark.org.tr/tr/pub/adyuebd

A Guideline for the Use of Recent Inclusive Practices in EFL Higher Education Contexts

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To cite this article:
Yatağanbaba, E. & Gümüş, Ö. (2024). A guideline for the use of recent inclusive practices in efl higher education contexts. *Adiyaman Univesity Journal of Educational Sciences, 14*(1), 47-61.

Adiyaman University Journal of Educational Sciences

Volume 14, Number 1, June 2024, Page 47-61 ISSN: 2149-2727
DOI: http://dx.doi.org/10.17984/adyuebd.1454615

A Guideline for the Use of Recent Inclusive Practices in EFL Higher Education Contexts*

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Abstract

The pursuit of inclusive education within English as a Foreign Language settings remains pivotal in ensuring equal learning opportunities for students with special needs (SSNs). The present research aims to address this gap by examining recent inclusive practices based on precedents and previous developments. However, the contemporary status of the research makes it necessary to explore historical developments and recent advancements in the field. The results of the comprehensive literature review advocates for inclusive pedagogies that cater the diverse needs of SSNs and suggest the need for educating EFL instructors in effective means to address the needs of SSNs. This paper offers an inclusive-practice-based guideline based on recent inclusive practices. Moreover, it provides potential directions for classroom practice and further research. Through collaboration and openness, the present research contributes to the discussion of ongoing discourse on inclusive education, particularly in the realm of EFL, and promotes the development of inclusive EFL classrooms conducive to the success of all learners.

Key words: Inclusive Practices, EFL, Students with Special Needs

Introduction

In the dynamic realm of education, the pursuit of inclusivity stands out as a crucial priority in extending pedagogical contexts and geographical boundaries. An escalating concern revolves around addressing learning needs of students with special needs (SSNs), to ensure that they have an equitable opportunity to be integrated into mainstream education and be segregated from their peers to the least extent possible (Davis & Braun, 2010). There is a commonly acknowledged consensus that SSNs should possess "the same rights as others in the community to achieve maximum independence as adults and should be educated to the best of their potential towards that end" (Jenkinson, 1993, p. 320). Overall, the effectiveness of educating SSNs alongside their classmates has been empirically validated, fostering positive outcomes in academic, social, and behavioural realms (Carter & Hughes, 2005). For this reason, inclusion has become a focal point in discussions on human rights and education equity, spurring the widespread adoption of inclusive instructional practices globally as shown by several studies (e.g., UNESCO, 2008; European Commission, 2014; Schleicher, 2019; Haug, 2017; Davis & Braun, 2010).

Across the globe, to advance inclusive education practices, substantial strides have recently transpired, leading the inclusive education policy to undergo ongoing revisions to provide more support for a greater number of SSNs (e.g., Florian, 2014; Mitchell, 2005; Nelis & Pedaste, 2020; Pijl et al., 1997; Carter & Hughes, 2005; Odom & Sailor, 2005).

Despite being a prominent concept in educational research (Ainscow, 2020; Haug, 2020, Lesar & Mihelic, 2020) and international policy documents over the past thirty years (UNESCO, 2008; European Commission, 2014; European Commission/EACEA/Eurydice, 2019; Schleicher, 2019), within contemporary education systems, exertion of inclusive education remains a persistent challenge. Furthermore, a noticeable discrepancy exists between its actual execution and conceptualization of inclusive education (Haug, 2017).

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* This paper presented at 5th TESOL Türkiye International ELT Conference: Embracing Differences: the Key to Inclusive Education, Held on 20 & 21 October 2023 at Bartın University under the title of "A systematic Review of Inclusive Education in EFL Higher Education contexts" by Esra Yatağanbaba & Özge GÜMÜŞ

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Moreover, the imperative to establish educational experiences that are accessible and equitable for all learners, irrespective of their diverse identities, abilities, or backgrounds, has prompted an increasing focus on inclusive practices in English as a Foreign Language (EFL) education (e.g., Richards & Rodgers, 2014; Tomlinson et al., 2003; Cummins, 2000; Harmer, 2015; Brantmeier, 2006). The initiative for inclusive practices continues to lag especially, in the EFL classrooms, which are progressively evolving into microcosms of cultural diversity where students from diverse sociocultural, socioeconomic, and linguistic backgrounds with unique learning experiences and needs converge, notwithstanding advancements in the quality and equity of education. Nevertheless, the significance of inclusive language education in EFL settings has never been more pertinent although English is in significant foreign language status and an obligatory subject in Türkiye. As EFL teaching and learning in Türkiye progresses, numerous research studies are delving into Turkish students' EFL learning from a variety of perspectives, such as EFL learning motivations, learning styles, language policies, etc. (e.g., Özçelik, 2013; Öz, 2011; Üstünel & Seedhouse, 2005; Gömleksiz & Şimşek, 2013; Başoğlu, 2016). Most of the previous research, on the other hand, has centered on EFL students and teachers' instructional practices in higher education, predominantly with students not requiring special education needs (SENs). Limited scholarly attention has been devoted to scrutinizing instructional practices implemented in EFL contexts for students with SENs.

In addition, the practical execution of inclusive education requires EFL instructors to possess qualities such as creativity, openness to learning from students, adaptability, and ability to initiate active learning, etc. (e.g., Forlin & Chambers, 2011; Slee, 2011; Sharma & Sokal, 2015; Florian & Black-Hawkins, 2011; Loreman et al., 2010; Ainscow, 2016). To ensure the optimal support to accommodate the diverse learning needs of SSNs, EFL instructors should utilize effective pedagogical approaches and techniques, choose pertinent instructional materials, tasks, and practices, and exhibit proficient classroom management skills (Farrel, 2015; Tomlinson, 2017; Garinger, 2009; Cumming & Driscoll, 1995; Harmer, 2012). Furthermore, EFL instructors of SSNs should comprehensively comprehend the causes, nature, interventions, and assessments of SSNs (Hallahan et al., 2005). Besides, the prospects for success in notable milestones and in attaining greater achievements in EFL learning are elevated when they are immersed in supportive educational environments and collaborate with EFL instructors who acknowledge their potential contributions (Hewett et al., 2018; Reed, 2013). Thus, it is recognized that it is necessary to support EFL instructors in equipping them with effective inclusive practices and strategies to enhance the success of SSNs in EFL classroom contexts. Achieving these objectives hinges upon thoroughly comprehending the inclusive practices executed in inclusive EFL educational settings. Additionally, EFL instructors' thorough comprehension of effective practices and methodologies can promote the learning process and modify their lessons accordingly tailored to their students' unique needs, and thus help them genuinely integrate them into regular classes (Beech, 2000; Garcia & Tyler, 2010; Reed, 2013; Vaughn et al., 2005). While there has been considerable scholarly investigation into teacher variables in various EFL contexts (Green & Stormont, 2018), previous research has failed to adequately discuss the inclusive practices of teachers within an EFL context, thus warranting comprehensive examination and avenues for future research. Therefore, the present paper was prompted by the imperative to provide a guideline for EFL instructors based on the inclusive practices implemented in EFL classes over the past five years. The overarching aim was to enhance the development of EFL-inclusive environments for SSNs and make suggestions for the use and design of inclusive practices.

The Structure of this Paper

This paper delves into various facets of inclusive practices within the context of EFL settings, organized into six sections. Following a concise exploration of the terminology utilized in the field and furnishing a definition of an ethos of inclusion grounded in the principle of equity, the first section traces the historical development of inclusive education (IE) approaches and presents an overview of the potential benefits of IE. The significance of teachers' practices and the implementation of IE in EFL classrooms are addressed in the second section, which also discusses a concise literature review of EFL teaching practices in IE contexts up until the last five years. EFL-inclusive practices employed over the past five years are provided in the third section. Section 4 concentrates on the implications and potential avenues for future research for cultivating an inclusive EFL setting. Section 5 delineates a set of guidelines for the use of IE practices in classroom settings. The last section concludes by summarizing the key arguments derived from the exploration, emphasizing the need for openness and collaboration among all stakeholders.

A Brief History of Inclusive Education

The widespread recognition of inclusive education has been significant; however, attaining a consensus-based definition of the concept accepted by all has proven challenging due to the diverse interpretations across various contexts (Mittler & Daunt, 1995, p.13).

The multifaceted interpretations of the concept of "inclusion" have been underscored by Pijl, Mijer, and Hegarty (1997), particularly in the American context, where it encompasses accessibility and active participation in the overall general education instructional program and the physical integration into a regular class and school (p. 106-107). They define it as:

> … "place", a classroom in a regular school building, and a seat in an age –appropriate general education classroom. It also means access to, and participation in, the general education instructional programme, either full-time or part-time. And it means bringing special education teachers or special education paraprofessionals into general education schools and classrooms to help make inclusion work. Beyond this broad conceptualization, however, inclusion can mean very different things in different schools and among different professionals.

For example, a discernible trend is observed in Spain and the UK in favour of adopting the term "children with special education needs" rather than "children with disabilities" or "handicaps" (Mittler & Daunt, p. 13). However, the international consensus concentrating on equal educational rights for individuals with various special education needs was represented by the Salamanca Statement (UNESCO, 1994).

IE is often the subject of discussions revolving around the distinctions between narrow (primarily focusing on children with special needs, striving for their full integration into regular classes or schools) and broad (encompassing all marginalized groups, guaranteeing the inclusion of children susceptible to exclusion for a variety of reasons) definitions (Ainscow, 2020; Haug, 2017; UNESCO, 1994).

In its exhaustive definition, inclusion is characterized as a process prioritizing all learners' participation and diverse needs while exclusion within and from the realm of education is mitigated (UNESCO, 2005, p.13). Inclusion is defined in the "Guidelines for Inclusion" as a process including various elements encapsulating its essence, as can be seen clearly in the subsequent description:

> Inclusion is seen as a process of addressing and responding to the diversity of needs of all learners through increasing participation in learning, cultures, and communities, and reducing exclusion within and from education. It involves changes and modifications in content, approaches, structures and strategies, with a common vision that covers all children of the appropriate age range and a conviction that the regular system's responsibility is to educate all children.

From an education standpoint, inclusion is delineated as the delivery of appropriate superior-quality instruction for SSNs within regular schools, with a particular focus on teachers' readiness and capacity to fulfill this responsibility (Pijl, Meiger, & Heagarty, 1997, p. 150-151). Walker and Covington (1998) endorse IE, arguing in favour of IE employing the optimal support services, supplementary aids, and pedagogical approaches to ensure the success of the learning process despite the absence of a universally agreed-upon definition of IE.

Achieving a single universally accepted definition of IE, despite the existence of a formal normative consensus, proves to be challenging (Haug, 2017). However, the establishment of a universally recognized definition has been considered necessary by Florian (2014) to actively aid the advancement of inclusive practices.

Considering the intricacy of the schools and the multitude of values underlying the Notion, Mitchell (2005) views inclusion to be a multifaceted concept characterized by various underlying values and processes. An all-encompassing definition has been put forward by Nelis and Pedaste (2020) who state in their systematic review:

> An educational approach that takes into account human rights and provides all children with access to high-quality education in a learning environment where children feel social integration and belongingness in their wider social network despite their diversity; it is achieved by meaningful participation of all children and personalized support in the development of each child's full potential" (Nelis & Pedaste, 2020, p. 162).

Reflecting a comprehensive understanding of inclusion, encompassing both practical implementations and philosophical principles, this definition highlights IE as an approach seeking to enable each child to actualize their full potential through active engagement and tailored support within a learning setting that cultivates belongingness and social integration. Considering all these varying definitions, it is realized that no single definition is agreed upon by all and encompassing every perspective. So, it would be possible to conceptualize it from multiple angles, the prominence of which is the subject matter it tackles and applies. The present study is grounded in adherence to this definition.

The Importance of Teacher Practices

Given its dynamic nature, a predetermined formula for ensuring the success of inclusive education is not readily available. For this reason, an essential prerequisite for its effectiveness is to procure "a good knowledge and understanding of the key the background to the development of inclusive education, its origins and influences international human rights and development instruments and documents, and the concepts, models, approaches and what makes inclusive education different from apparently similar paradigms" (Stubbs, 2008, p.52). In scholarly literature, several factors have been discussed to affect the outcome of inclusion implementation. So, sharing experiences and support for teachers would help them to obtain ideas from their colleagues' practices that they may utilize to accommodate their instructional needs in their inclusion contexts. This could be shown in the form of instructional and environmental changes. These changes in educational contexts are called adaptations and support all students with equal access to success, affordances, and results (Wright, 2003). Along with accommodations that entail assessment-related and instructional decisions targeted towards tailoring students' needs, maximizing the benefits of the curriculum, and ensuring the SSNs' participation in regular classes (Green & Stormont, 2018) and modifications that contain changes to the expectations, learning materials content, and their assessment criteria to meet performance standards and changed curriculum goals (Elliot & McKevitt, 2000), these adaptations are integral requirements of achieving a fruitful inclusive education framework. Since inclusion is not a painless process, helping English teachers learn approaches and mechanisms that they can apply to their inclusive classroom contexts based on shared ideas from their colleagues' practices is crucial. This is of high importance in English-inclusive classes as prior studies have identified that SSNs may encounter a myriad of academic challenges, including study skills, math computation, feelings of helplessness and frustration, challenges in memory organization and prioritization, struggles in spelling, writing, and reading comprehension, nervousness, and anxiety (L'ecuyer, 2014; May & Stone, 2010). They have additionally issued information related to receptive and expressive oral language, following directions, meeting deadlines, and language proficiency. They also reported that problems are also identified in interpersonal relationships leading to a tendency to undervalue their achievements. In addition, issues encountered in foreign languages, humanities, and social sciences are among the documented problems.

For Hornby (2014), teachers' recognition of such challenges would be insufficient to successfully implement inclusion, and they must also be knowledgeable about diverse teaching practices that are appropriate to the different types of special needs. Previous studies have shown that teachers of inclusive classes utilize diverse teaching styles and differentiate their inclusive practices (e.g., Hodge et al., 2014). Thus, to enhance these practices, comprehensive teaching guidelines become imperative as the success of any inclusive education policy is highly contingent upon the issues addressed related to the improvement in learning contexts and provides for increased learning opportunities through various resources like instructional materials, alternative curriculums, specialized teaching practices, and equipment, or collaboration with other parties (Orelus & Hills, 2010).

Inclusive practices in EFL settings

In educational settings all over the world, over decades of research, the positive effects of inclusive education have been proven and thus IE has gained increasing recognition and importance (e.g., Sáenz et al., 2005). Within the EFL context, the importance of the implementation of inclusive practices has been highlighted by Russak (2016), who states that according to policy documents, the needs and/or rights of SSNs who are required to learn English will not be neglected. Implementing IE practices in EFL classrooms holds particular significance as SSNs might have more difficulty learning languages than others drawing upon scholarly research (e.g., Androu et al., 2019; Ho & Fong, 2005; Marashi & Dolatdoost, 2016). Specifically, it was found that academic problems such as oral/written speech comprehension and phonological awareness would be encountered more likely in students with learning difficulties (Androu et al., 2019), corroborated by the findings of Ho and Fong (2005) who found that ss with dyslexia achieved worse results than others in nearly all English tests. In Marashi and Dolatdoost's study (2016) a significant negative correlation was found between ADHD and speaking complexity, accuracy, and fluency (CAF). Thus, as SSNs undoubtedly experience more difficulties in EFL learning, it is of high importance to pay more attention to them to ensure that they can fully participate and benefit from language learning experiences.

Various aspects involving the role of teacher attitudes, beliefs, the use of technology, teacher training, curriculum design, and pedagogical approaches have been explored in recent research on inclusive practices in EFL settings (e.g., Benson & Chik, 2017; Arar, 2019; Bosman & De Boer, 2020; Ferguson, 2018; Richards & Farrell, 2021; García-Sánchez & Díaz-Pérez, 2019; Borg & Al-Busaidi, 2020). Moreover, research has explored the importance of culturally responsive pedagogy in enhancing inclusion in EFL classrooms (e.g., Holliday, 2020). Additionally, previous research has indicated the inadequacy and/or insufficiency of initial teacher training are among the primary causes of teachers' limited knowledge about successful intervention programs

and inclusive practices (e.g., Joshi et al., 2009; Goldfus, 2012). In the same vein, effective intervention programs and inclusive practices are found not only necessary to implement effective instruction to SSNs but also have been determined to serve as a crucial foundation for teachers' self-confidence in inclusive settings, thus leading to striving for better inclusive practices (e.g., Goldfus, 2012; Moats, 1994; Washburn et al., 2011; McCutchen et al., 2002; McCutchen et al., 2002; McCutchen et al., 2009; Podhajski et al., 2009). On the other side, teachers' self-efficacy beliefs may decrease due to the unavailability of teacher training or professional development, thus lack of background knowledge along with the increasing social and educational pressures regarding the execution of inclusive practices, possibly leading to negative attitudes toward inclusion. Contact and previous success in teaching students with SEN (teacher-related variables), the supply of teaching resources, and cooperation with other teachers, school administrators, and parents of the students have shown a direct impact on the teachers' perceptions (Sharma & Deppeler, 2012). Thus, based on the recognition of the positive effects of recent research, there is a need to explore instructional inclusive practices to improve the outcomes for learners.

The literature underscores the significance of encouraging inclusive education in EFL settings to improve L2 learning outcomes and ensure equitable access. Inclusion in EFL settings will be effective "if teachers are able to respond to a wider range of needs and this could be achieved through greater differentiation of tasks and materials" (Davies, 2004). Teachers have a central role to play in the execution of inclusive practices and their development. However, they cannot accomplish or maintain positive change without support from the wider educational community. Beyond schools, assessment providers, educational publishers, policymakers, and other stakeholders all are required to improve an inclusive educational system.

EFL Inclusive Practices Utilized in the Last 5 Years

The global educational landscape has witnessed a significant transformation in recent years, with a surge in the number of English language learners who embark on their linguistic journey in diverse EFL classrooms. These learners come equipped with many linguistic, cultural, and cognitive attributes, presenting challenges and opportunities for educators. To address this diversity and promote equitable learning experiences, educators have turned to inclusive language education, a framework that seeks to accommodate every learner's unique needs and backgrounds.

Although several studies recognize the importance of inclusive EFL practices, previous studies have failed to address EFL instructors' inclusive practices. Within the context of Türkiye, teaching processes involved in inclusive EFL settings have not been dealt with in depth. EFL instructors are not empowered to provide effective inclusion due to the lack of necessary teacher training. Therefore, this gap opens a rich space for further research. In this section, we aim to provide the inclusive practices employed by EFL teachers in the last 5 years by summarizing them before suggesting a guideline for EFL teachers.

Inclusive education in EFL settings encompasses a range of strategies, from context-specific approaches tailored to the nuances of each learning environment to the integration of technology and the promotion of multicultural awareness (Altaher, 2020; Galante et al., 2019; Kahanurak et al., 2022; Sanczyk, 2021). For instance, in Altaher (2020) multicultural videos were used in an English-level course to support learning. The study showed a positive relationship between multicultural videos and their dependent variables, reflecting on the ways in which the use of those videos enabled the teacher to enhance inclusive teaching in a tertiary classroom and could assist students of various backgrounds in participating and engaging fruitfully. In another higher education context, Galante et al. (2019) implemented plurilingual tasks and offered a collaborative framework consisting of four elements: administrative support, teachers' interest in using languages other than English in class, weekly collaboration, and learner-centred tasks. The authors claimed that students could benefit from this movement, from an English-only policy to a plurilingual approach and collaboration, and this shift could only be possible by leading EFL teachers and program directors and encouraging language teachers and program directors to change in this direction.

In a similar vein, Sancyzk (2021) explored how adult ESL teachers build up culturally responsive pedagogy. The author suggested that the teachers used various culturally responsive practices ranging from learning about students and accepting their languages to empathizing with them creating learning opportunities through diverse curricula as well as constructing meaningful relationships and bridging communities. The author concluded by suggesting more empirical data is needed on adult ESL teachers' culturally sensitive implementations because most of the research on this topic focuses on K-12 settings. As can be induced from these studies, more empirical research should be carried out in tertiary contexts in terms of inclusive foreign language practices.

Apart from multicultural issues, inclusive foreign language practices extend to considerations of gender-fair language policies (Lohe, 2022; Tarrayo, 2023). In her study, Lohe (2022) discussed the importance

of EFL classrooms for dealing with gender and sexuality topics. Adopting a quantitative approach and collecting data through a student questionnaire in a tertiary context, she asserted that most of the students came across gender as a topic at universities, yet still, there is a need to develop gender awareness in many students as they have traditional notions of gender or are not interested in the topic. To promote gender awareness for adult students, the author proposed critical incidents to foster gender awareness and stimulate reflection processes, as well as display alternative performative options that somehow deal with gender topics. This is exemplified in the work undertaken by Tarrayo (2023) focusing on the experiences of English language teachers in applying gender-fair language to their teaching practices. Findings showed that using gender-fair language ensured inclusivity, promoted gender perceptions, and challenged inherent norms of gender inequality. Teachers used gender-related instructional materials to promote class interactions and involved tasks focusing on gender-fair language and gender inclusivity. All in all, the author claimed that transforming classroom language into a gender-fair language in ELT supports students' development socially and creates an inclusive language learning environment.

Researchers have also investigated topics such as the inclusion of students with physical and learning disabilities (Attachoo & Sitthitikul, 2021; Csizer & Kontra, 2020; Seiradakis, 2022; SowEFL & Sugisaki, 2020; Yuliyan et al., 2022), the use of universal design for learning (UDL) (Altaher, 2020; Husin et al., 2022; Lintangsari & Emaliana, 2020 and differentiated instruction (DI) (Çelik, 2017; Rafi & Pourdana, 2023). Attachoo and Sitthitikul (2021) investigated the lived experiences of visually impaired EFL students in Thailand. The study pointed out a discrepancy between the policies and actual practices. However, it also demonstrated the positive perceptions of EFL students for the inclusive classroom concept as well as factors motivating their EFL success and language learning strategies. Another study, which examined the conditions for blind students from the EFL teachers' perspectives, demonstrated that teachers are faced with a range of problems from inadequate teaching resources to lack of university policies. The findings of the study highlight that equipping teachers with disability-oriented training programs and supporting them with quality educational materials and evaluation tools adopting UDL and DI perspectives toward EFL teaching are prerequisites (Lintangsari & Emaliana, 2020; Arslan, 2023).

To shed more light on the peculiarities of deaf and severely hard-of-hearing students, Csizer and Kontra (2020) explored the challenges and drawbacks of foreign language learning. Their study demonstrated that those students' foreign language learning experiences are replete with challenges in contrast to their dedication and willingness to learn. Based on their findings, the authors recommended that practitioners create learning environments in which they can use national sign language to contribute to the efficiency of teaching. In addition, they urged the teachers to employ effective learning strategies and support the learners with autonomous learning.

Moreover, Yulian et al. (2022) investigated how EFL slow learners discern the integration of inclusive technology with authentic multimedia-assisted language learning. Findings revealed that students found authentic multimedia-assisted language learning advantageous concerning its practicality and efficiency for speaking skills. Investigating learning disabilities from the EFL teachers' perspectives, Sowell and Sugisaki (2020) found that the participating EFL teachers were found to have no training for learning disabilities. Also, they did not believe that they could help students with learning disabilities. Therefore, they recommended that accommodating learning disabilities in EFL contexts includes the support of administrative staff. Most importantly, EFL teachers should also acquaint themselves with these obstacles through professional development.

Furthermore, it has been demonstrated that inclusive practices in English language teaching are effective at helping students with learning difficulties improve themselves in various skills like writing (Jozwick & Cuenca-Carlino, 2020) and understanding academic material and vocabulary in English (O'Connor et al., 2019). These studies integrally pointed out EFL teachers have a pivotal role in carrying out inclusive practices and the success is firmly contingent on the teachers' attitude and training in inclusive language education (Aksu-Ataç & Taşçı, 2020; Yastıbaş, 2021). Lack of training on inclusive L2 education might cause EFL teachers to feel inadequate (Rezai et al., 2018) as they need to possess pedagogical skills (Heijnen Maathuis, 2019) to assist students with learning English difficulties regardless of their positive attitudes toward inclusive education in English language teaching (Arribas et al., 2020).

In addition to addressing foreign language learning disabilities in different contexts, the literature points out various instructional solutions to these problems. As such, differentiated instruction (DI) is offered as a viable solution to inclusive L2 education (Çelik, 2017; Rafi & Pourdana, 2023). For example, Çelik (2017) suggested that teachers could create an inclusive context by employing various instructional methods for different learners. By conducting action research in a primary school, the author displayed a good example of empirical research. Rafi and Pourdana (2023) integrated diagnostic assessment and collaborative language learning in a differentiated (tiered) oral tasks intervention and applied them in a Google Meet cyber classroom.

Their study demonstrated that DI practices that accommodate diagnostic assessment and collaboration are closely related to inclusive L2 education. This study also demonstrated that DI is an under-documented inclusive practice in EFL teaching.

As the recent literature shows, translanguaging, World Englishes (WE), English as a Medium of Instruction (EMI), and Content and Language Integrated Learning (CLIL) are other aspects to consider in inclusive L2 education. For instance, Meletiadou (2022) investigated learning strategies such as peer-assisted learning/mentoring and translanguaging as inclusive learning strategies to help students' shift into higher education and promote their well-being in the post-COVID. The author found that using these strategies showed significant performance development in the students' academic achievement and fostered a "psychologically safe space" with their peers. In the Turkish context, Solmaz (2020) examined the awareness and perceptions of pre-service English language teachers for WE instruction and whether they would implement WE-inclusive practices in their future classes. Results demonstrated an increased awareness of WE instruction in pre-service teachers' WE-inclusive practices. Their positive attitude towards the WE practices was also reported.

CLIL is another methodology that caters to the diverse learning needs of all learners. Hu (2021) examined the impact of CLIL in an online English teaching program as an inclusive practice with a sequential explanatory mixed-methods approach. The study demonstrated that CLIL is a tailor-made inclusive methodology to help learners of different academic abilities; participating students attained remarkable achievements both in language and content learning in an online CLIL context.

Similarly, another observable trend, which is EMI, has emerged as a popular strand for inclusive language learning practices research (De Costa et al., 2021; Han & Dong, 2023; Tai, 2022). De Costa et al. (2021) argued that inclusion, equity, and access should on the centre of EMI and transnational higher education because these aspects are conducive to creating an inclusive foreign language learning environment that fosters intercultural competence and tolerance, supports diverse learning profiles, and prepares students for global citizenship. For example, studying the EMI learning experiences of international students at a university in China, Han and Dong (2023) found out that overseas students faced exclusion and inequality regardless of diversity promotion of the institutions. The authors argued that universities reproduce social stratification inequalities among international students via "explicit and implicit institutional practices" and called for a more "inclusive pedagogical approach" to preclude international students from being excluded and welcome those from disparate backgrounds for global citizenship. Lastly, Tai (2022) examined how EMI teachers utilized various resources to ensure that all students had access to discipline-specific knowledge. As per the findings of this study, inclusive practices were in line with the translanguaging process, which requires EMI teachers to make multilingual and semiotic resources available, as well as base their instruction on what students already know.

Having set the scene for inclusive language teaching across the globe, we would like to state that though inclusion has gained momentum among scholars and governmental bodies in recent years, studies are limited in Türkiye in foreign language education. In an attempt to investigate whether the new-service English Language Teacher Education Program (ELTEP) offers effective training on inclusive education, Yastıbaş (2021) identified the following terms in the curriculum of teacher training: special education and inclusion, education of hospitalized students, learning difficulty, attention deficit hyperactive disorder, inclusive education, and individualization and adaptation of teaching. However, the author also pointed out the question of whether when these teachers start teaching, they could find these courses helpful for their EFL teaching practices or not in their contexts remains unanswered.

Thus far, this section has attempted to summarize the recent literature on inclusive EFL practices in contexts from K-12 to higher education across the globe. The following section moves on to consider implications and future research areas for developing an inclusive EFL environment.

Developing an Inclusive EFL Environment: Implications and Future Research Directions

In this section, we aimed to expand pedagogical implications by drawing upon existing findings on inclusive language education for EFL teachers. We have also offered a diverse range of potential trajectories for future research directions.

First, incorporating inclusive practices into English language teacher education is a promising area to focus on for future studies. While previous studies have underscored the importance of empowering pre-service and in-service teachers to implement inclusion, the number of these studies is limited (Ali, 2018; Blume, 2019; Chan & Lo, 2016). Collectively, these studies point out that EFL teachers should be granted autonomy to help their students in need; a collaborative milieu is needed because the fact that EFL teachers could share their experiences with their colleagues amplifies the impact of their inclusive practices on society. In addition, EFL

teachers should be introduced to up-to-date inclusive methodology and curriculum and benefit from in-service training opportunities to support their students with disabilities and special needs. Thus, studies building on these practices are needed in inclusive EFL contexts.

Second, having analysed the recent literature on inclusive EFL practices, it is noted that the predominant methodology of these studies is either observational, in which data collection tools mostly are questionnaires, or qualitative, in which interviews are used to collect data (See Altaher, 2020; Attachoo & Sitthitikul; 2020; Rasmitadila et al, 2020; Sanczyk, 2021) Besides, the studies did not adopt a control group or use objective measures to explore the extent of the actual improvement in language learning and achievement, making it difficult to observe the development effects. Given this, considerably more studies with more quantitative and mixed-method designs (See Alobaydi et al.,2021; Csizer & Kontra, 2020; Hu, 2021) will need to be done to explore the extent of the actual improvement in language learning and achievement, which makes it difficult to observe the development effects of inclusive EFL practices. These studies could be carried out comparatively and longitudinally to reach more systematic and empirical data.

Third, another promising avenue for exploring inclusive EFL practices is results concerning the positive effects of using technology and multimedia to enhance student motivation. Limited studies (Alcantud-Diaz & Soler Pardo, 2022; Yulian et al.,2022) have shown that assisted technology with multimedia elements for language learning could be helpful for learners to develop basic oral language skills such as speaking, fluency, structure, and vocabulary of EFL slow learners or instrumental in teaching learn to learn. Building on this, more empirical studies should focus on utilizing digital technologies including Generative Artificial Intelligence tools to assist EFL learners with disabilities or enhance their motivation.

The fourth area of further research could be examining how EFL learners with disabilities and from different cultural backgrounds will benefit from culturally linguistically responsive pedagogy in their learning experiences. Further experimental research needs to be carried out both to promote inclusive practices and assess their impact on student learning. Recent studies have supported the idea that (Altaher, 2020; Galante et al., 2019; Meletiadou, 2022; Kahanurak et al. 2023) more systematic and empirical research should be carried out from K-12 to higher education institutions involving both EFL teachers and learners. Accordingly, instructional strategies and policies that support multicultural and multilingual inclusive practices must be implemented and for these policies to be put into practice, more empirical evidence is needed across different contexts.

Proceeding further, as recent studies have indicated, EFL practices can be implemented through certain approaches and methodologies such as CLIL, translanguaging, differentiated instruction, and World Englishes instruction (Han & Dong, 2023; Hu, 2021; Lintangsari & Emaliana (2020); Meletiadou, 2022; Rafi & Pourdana, 2023; Solmaz, 2020). These studies have collectively shown that these instructional strategies might be useful to include EFL learners with diverse needs and characteristics; however, as these studies are limited by qualitative findings, future studies could benefit from more empirical studies with larger learner groups in various teaching and learning contexts. Also, some findings present evidence for inclusive practices. To exemplify, in a recent study, Han and Dong (2023) claimed that although EMI has the potential to benefit EFL learners, inclusive practices should be carefully designed so as not to "reproduce inequalities of social stratification of international students through explicit and implicit institutional practices". The authors highlighted that without careful design and implementation, even well-intended applications might lead to the marginalization of international language students of diverse socio-cultural and economic backgrounds. Therefore, further research might explore whether this is the case in other international contexts or not.

Moreover, there is still room for investigating inclusive EFL education as a university policy. To our knowledge, there is no study that specifically deals with determining the impact of such policies on educational practices and perceptions of lecturers as well as their challenges in this aspect.

Relevant literature shows that inadequate resources and teacher training addressing inclusion and disabilities are some of the obstacles EFL professionals encounter (Lintangsari & Emaliana, 2020). Owing to this, further work is needed to fully understand the implications in Turkish higher education and K-12 contexts.

Lastly, replication studies should be carried out to grasp the results and recommendations of the studies. As the majority of the recent studies are qualitative, their results cannot be generalized, but by replicating those studies, findings can be verified and consolidated. As McManus (2022) suggested, replication studies are required to establish "the field's evidence base". Therefore, another potential area would be to execute replication studies for inclusive EFL implementations and theories.

The scope of the paper limits suggested recommendations, nonetheless, the implications provided show that there is ample room to extend this line of inquiry, especially longitudinal and empirical studies carried out for EFL learners with physical and learning disabilities. As stated in UNESCO (2009, p. 19), "accessible and

flexible curricula, textbooks and learning materials can serve as the key to creating schools for all. Many curricula expect all pupils to learn the same things, at the same time, and by the same means and methods. But pupils are different and have different abilities and needs.". To close the section, we would like to highlight that all EFL learners are unique, and they have different capabilities and needs in their context, it is high time that we as language professionals, do our best to cater to their needs.

Breaking Barriers through Suggested Inclusive Practices: A Guideline for the Use of Inclusive Practices in EFL classrooms

Following the theoretical discussion and suggestions that were presented earlier in this study, we have outlined a guideline for EFL professionals to implement the following strategies in their classrooms. This section has offered some practical suggestions for integrating inclusive practices into EFL classes as a review of the literature suggests a need for higher education to move beyond simply meeting legislative requirements and to support the existence of inclusive practices in inclusive EFL classes (e.g., Avramidis & Norwich, 2002; Black-Hawkins et al., 2021; Pilner & Johnson, 2004).

1. Multicultural Videos and Inclusive Teaching:

EFL teachers should consider incorporating multicultural videos into their teaching methods to promote inclusive learning. Such videos can help students from diverse cultural and educational backgrounds participate and engage more effectively (Altaher, 2020; Galante et al., 2019; Kahanurak et al., 2022; Sanczyk, 2021).

2. Content and Language Integrated Learning (CLIL):

Teachers should recognize the potential benefits of CLIL for all learners. Tailoring CLIL to meet students' diverse needs and learning levels can enhance inclusive L2 education (Hu, 2021; Meletiadou, 2022)

3. Instructional Strategies for Inclusive Classrooms:

EFL teachers should explore instructional strategies based on the brain's natural learning system. These strategies are well-suited for inclusive classrooms in higher education (Altaher, 2020; Attachoo & Sitthitikul, 2021; Csizer & Kontra, 2020; Çelik, 2017; Husin et al., 2022; Lintangsari & Emaliana, 2020; Seiradakis, 2022; SowEFL & Sugisaki, 2020; Rafi & Pourdana, 2023; Yuliyan et al., 2022)

4. Gender and Self-Esteem in Inclusive L2 Education:

Teachers should acknowledge that there may be no significant gender-based differences in self-esteem and attitudes toward inclusive L2 education. However, it's essential to be aware of any variations and address them to ensure inclusivity (Lohe, 2022; Tarrayo, 2023).

5. Inclusive L2 Education Policy and Practices:

Teachers should be aware of the role of university policies in promoting inclusive L2 education. Utilizing Universal Design for Learning (UDL) and Differentiated Instruction (DI) can contribute to successful implementation. Overcoming resource limitations and providing teacher training are crucial for effective inclusive L2 education (Lintangsari & Emaliana, 2020; Arslan, 2023).

6. Challenges Faced by Deaf and Hard-of-Hearing Students:

Teachers should be sensitive to the challenges that deaf and hard-of-hearing students face. Recognizing these challenges and providing appropriate support can foster inclusivity (Csizer & Kontra, 2020).

7. Essence of Inclusive Language Learning:

Teachers should focus on both the positive and negative aspects of inclusive language learning. The findings can guide teachers, practitioners, and administrators in shaping future practices (Alcantud-Diaz & Soler Pardo, 2022; Yulian et al.,2022).

8. Culturally Responsive Pedagogy:

EFL teachers should consider incorporating culturally responsive practices into their teaching methods. Learning about students, offering diverse curricula, and building meaningful relationships can facilitate inclusion in diverse classrooms (Altaher, 2020; Galante et al., 2019; Holliday, 2020; Kahanurak et al., 2022; Sanczyk, 2021).

9. Technology and Motivation:

Teachers should recognize that technology can impact students' motivation in multifaceted ways. This highlights the importance of integrating technology thoughtfully to enhance motivation (Alcantud-Diaz & Soler Pardo, 2022; Yulian et al.,2022.

10. Peer-Assisted Learning and Translanguaging:

Teachers can consider the use of peer-assisted learning (PALM) and translanguaging as inclusive learning strategies. Combining these methods can create a psychologically safe space for learners (Meletiadou, 2022) .

11. Establishing Inclusive Policies:

Institutions and teachers should collaborate to identify existing policies or create new ones to support inclusive L2 education. This collaboration should involve resource assessment, barrier removal, leadership roles, and professional development (De Costa et al., 2021; Han & Dong, 2023; Tai, 2022).

12. World Englishes (WE) Instruction:

Teachers should recognize the potential of WE instruction to raise awareness and develop positive attitudes among students. Encouraging WE-oriented practices in future classes can promote inclusivity (Solmaz, 2020).

13. Gender and Sexuality Topics:

Teachers can consider the importance of EFL classrooms in addressing gender and sexuality topics. Recognizing the need for gender awareness and catering to students' interests in these topics is vital for inclusivity (Lohe, 2022; Tarrayo, 2023).

14. Dyslexia-Friendly Language Learning:

Teachers should provide dyslexia-friendly affordances in language courses. Students' perception of course relevance and effectiveness can be enhanced through such accommodations (Seiradakis, 2022).

15. Multimedia-Assisted Language Learning:

EFL teachers should explore multimedia-assisted language learning to improve their English skills. Using project-based instruction and culture-related tasks can evaluate speaking skills effectively (Alcantud-Diaz & Soler Pardo, 2022; Yulian et al.,2022).

16. Teaching Strategies and Student Motivation:

Teachers can focus on teaching strategies that enhance students' perception of teachers' efficiency. Recognizing the connection between motivation and teaching strategies is crucial for inclusive L2 education (Farrel, 2015; Tomlinson, 2017; Garinger, 2009; Cumming & Driscoll, 1995; Harmer, 2012).

17. EFL Teacher Perceptions of Inclusion:

Teachers should be aware that EFL teachers may have varying perceptions of inclusion. Professional development and training can help align perceptions and promote inclusivity (García-Sánchez & Díaz-Pérez, 2019; Sharma & Deppeler, 2012).

18. Differentiated Instruction (DI):

Integrating DI and collaboration in practice are parts and parcels of inclusive L2 education. Thus, collaboration and teamwork are crucial aspects to integrate into L2 teaching (Çelik, 2017; Rafi & Pourdana, 2023).

19. English as a Medium of Instruction (EMI):

Teachers should consider the potential implications of EMI for international students. Structural mechanisms and policies should be examined to reduce educational inequalities among international students (De Costa et al., 2021; Han & Dong, 2023; Tai, 2022).

20. Gender and Language Learning:

Teachers should explore ways to integrate gender and sexuality topics into ELT. Utilizing gender-themed instructional materials and fostering inclusive activities can create an inclusive learning environment.

21. Training for Identifying Learning Disabilities:

Teachers should recognize the need for training in identifying and accommodating students with learning disabilities. Such training can help teachers develop competence in assisting these students effectively (Arslan, 2023; Haug, 2017; Jozwik et al., 2020; Lintangsari & Emaliana, 2020; O'Connor, 2019; Sowell & Sugisaki, 2020).

22. Formative Assessment strategies:

To identify the student's progress, formative strategies could be used to help inform teaching approaches. EFL teachers should benefit from more formative assessment strategies as they are more inclusive and responsive to identifying the EFL learners' target areas to work on (Rafi & Pourdana, 2023).

Conclusion

The current paper demonstrates that inclusive EFL teaching and learning is a long and arduous process, and there is no one-size-fits-all solution for implementing inclusive teaching effectively. Every context needs its tailor-made resolutions and EFL teaching is no exception for this. Literature concerning inclusive practices has indicated that the pursuit of inclusivity remains a pressing priority in the EFL context. This paper has provided a comprehensive investigation of recent inclusive practices utilized in EFL settings. This paper has also highlighted that teachers 'must be equipped with a thorough understanding of their students' unique needs and diverse skill set to effectively implement inclusive practices. Based on the implications of these studies, a comprehensive guideline comprising 22 pedagogical suggestions for integrating inclusive practices into EFL classrooms emphasizes the significance of the awareness of diverse student identities and needs, technological integration into inclusive EFL classrooms, differentiated instruction and multiculturalism. Moving forward, to foster effective inclusive EFL classrooms, ongoing teacher training or professional development for instructors, collaboration among all stakeholders and more empirical and longitudinal studies into effective inclusive EFL practices are of high importance. In proposing this guideline, we have aimed to provide practical solutionsby synthesizing the recent literature on inclusive EFL practices with implications and identifying potential avenues for future research. In doing so, we have aspired to contribute to the ongoing discourse on inclusive EFL practices and their role in shaping the future of language education. By embracing these suggestions and principles, EFL instructors can work towards breaking down barriers and creating truly inclusive instructional practices.

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