

Developing a Cognitive Presence Framework for Inclusive Teaching: A Professional Development Training for K-12 Teachers of Special Education and Autism

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Abstract

The objective of this research was to construct a framework for cognitive presence in the context of inclusive teaching and to furnish a training program for K-12 educators specializing in special education and autism. The research employed a mixed-methods methodology, encompassing quantitative and qualitative techniques for gathering and analyzing data. The efficacy of the cognitive presence framework in fostering critical thinking and meaningful online discussions has been established, and its applicability to diverse educational settings has been demonstrated. The study revealed that the professional development training program had a positive impact on the attitudes towards inclusive teaching practices. The participants reported an enhanced comprehension of inclusive teaching practices and practical approaches to assist diverse learners in their classrooms. The research results offer significant perspectives on the advantages of creating a cognitive presence model and delivering professional development instruction to K-12 educators who specialize in special education and autism. Additionally, the findings underscore the significance of fostering critical thinking and inclusive pedagogical approaches to cater to the requirements of heterogeneous learners in the educational setting. Notwithstanding, the limited sample size of the study and the utilization of self-reported measures constrain the applicability of the results. Consequently, additional research is required to assess the efficacy of these interventions in diverse settings.

Keywords: *Cognitive Presence, Inclusive Teaching, Professional Development.*

Introduction

The concept of inclusive education has garnered considerable attention in contemporary times as a strategy to ensure equitable educational opportunities for all learners, including those with disabilities or exceptionalities, through their integration into regular classrooms. The objective is to establish an educational setting that is conducive to learning and promotes cooperation and equitable treatment among students, regardless of their disabilities.

Teaching in an inclusive setting can pose notable difficulties for educators, particularly those instructing students with special education needs and autism (Ferraioli & Harris, 2011). The educators necessitate specific instruction to cultivate the competencies and tactics essential for establishing a nurturing and all-encompassing educational milieu for pupils with exceptional requirements.

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According to Mangope & Mukhopadhyay, (2015) the insufficiency of efficacious professional development initiatives that equip educators with the requisite competencies and methodologies to proficiently instruct students with exceptionalities is a pressing issue, despite the imperative for specialized instruction. Educators may exhibit a deficiency in comprehending the methods for establishing a nurturing and all-encompassing educational milieu, as well as techniques for adapting the course content or pedagogy to cater to the unique requirements of every learner. Insufficient specialized training frequently results in educators encountering difficulties in establishing an inclusive learning environment, which ultimately leads to students with exceptionalities being marginalized and unable to achieve their maximum potential.

The aforementioned matter underscores the pressing requirement for a cognitive presence framework in the realm of inclusive pedagogy, which would equip educators with the essential competencies and tactics to proficiently instruct students with exceptionalities within an inclusive learning environment. The implementation of a framework will facilitate a comprehensive comprehension of the tactics necessary to cultivate a conducive and all-encompassing learning milieu, encourage active participation in the learning process, and nurture analytical thinking skills among the entire student body. The implementation of a cognitive presence framework in teaching can enhance inclusivity by providing educators with a comprehensive comprehension of students' learning processes (Kilis & Yildirim, 2019). This framework can aid in the identification of strategies and techniques that can be employed to cater to the diverse needs of students and promote their active participation in the learning process.

The development of such a framework and professional development training program has the potential to significantly improve the quality of education for students with special needs in K-12 schools. Habrat & Habrat, (2018) stated that Empirical evidence suggests that the integration of students with special needs into mainstream classrooms can yield favorable results, such as enhanced interpersonal competencies, scholastic performance, and self-regard. Hence, it is imperative to provide educators with the requisite competencies and tactics to establish an all-encompassing learning environment that caters to the heterogeneous requirements of every learner.

Problem Statement

The significance of inclusive pedagogy and the requisite for tailored instruction for educators of special education and autism is noteworthy. However, there exists a dearth of efficacious professional development initiatives that equip teachers with the necessary competencies and tactics to proficiently educate students with exceptionalities. The inadequacy of teachers' skills and strategies can pose a significant challenge in establishing an inclusive classroom, potentially leading to the exclusion of students with special needs and impeding their academic progress.

Research Objectives

The aim of this study is to construct a professional development training program for K–12 special education and autism teachers as well as a cognitive presence framework for inclusive teaching. The framework and training course will be built on the most recent findings in the fields of inclusive teaching, cognitive presence, special education, and autism, and they are intended to give instructors the tools and techniques they need to successfully teach students with special needs.

Research Questions

1. What is the cognitive presence framework for inclusive teaching?
2. What are the specialized skills and strategies that teachers of special education and autism need to create an inclusive classroom?

Literature Review including previous studies

In recent years, the notion of inclusive education has garnered considerable attention as a means of affording equal educational opportunities to all students, including those with disabilities or special needs. The concept of inclusive education is based on the principles of social justice and equity, with the aim of facilitating equal access to education for all students, irrespective of their abilities or backgrounds. Extensive literature has documented the advantages of inclusive education, indicating that it can result in favorable consequences for students with and without disabilities. These benefits include enhanced social skills, academic performance, and self-confidence, as evidenced by research conducted by Pulford et al., (2018).

Teaching in an inclusive setting can pose notable difficulties for educators, particularly those who specialize in special education and autism (Al-Amrat & Khasawneh, 2022). Toom et al. (2017) stated the educators necessitate specialized instruction to cultivate the proficiencies and tactics essential for establishing a nurturing and comprehensive educational milieu for pupils with exceptional requirements. The existing body of literature has recognized a number of obstacles encountered by educators in inclusive learning environments. These challenges encompass insufficient specialized instruction, inadequate provision of resources and support, and struggles in catering to a wide range of learning requirements (O'Dwyer & Athi, 2015).

Empirical evidence suggests that proficient professional development initiatives can substantially contribute towards endowing educators with the requisite competencies and tactics to instruct in an all-encompassing milieu. Presently, there exists a dearth of efficacious professional development initiatives that equip educators with the requisite competencies and tactics to proficiently instruct pupils with exceptionalities (Henry & Namhla, 2020). There is a possibility that educators may not possess the necessary knowledge to establish a conducive and all-encompassing learning atmosphere, as well as techniques to adapt the educational content or guidance to cater to the unique requirements of each learner.

The development of a cognitive presence framework for inclusive teaching is a plausible resolution to this matter. The cognitive presence framework is a methodical strategy for instruction that encourages dynamic participation in the learning process, analytical reasoning, and proficiency in resolving complex issues (Parrish et al., 2021). The statement elucidates the strategies necessary for cultivating a learning environment that is both inclusive and supportive. Additionally, it advocates for active participation in the learning process and the cultivation of critical thinking skills among all students. The implementation of a cognitive presence framework in teaching can enhance inclusivity by providing educators with a comprehensive comprehension of students' learning processes. This framework can aid in the identification of strategies and techniques that can be employed to cater to the diverse needs of students and promote their active participation in the learning process.

Prior research has explored the efficacy of cognitive presence frameworks across diverse educational contexts. Formulated a conceptual model for e-learning, which prioritized the significance of social, cognitive, and teaching presence in fostering substantial learning (Taghizadeh & Assadollahi, 2021). The researchers discovered that the framework demonstrated efficacy in fostering active engagement and critical thinking skills among students in virtual learning settings.

Cognitive presence model aimed at fostering critical thinking within science educational settings (Law et al., 2019). The study revealed that the framework demonstrated efficacy in fostering critical thinking and problem-solving proficiencies in students, as well as enhancing their performance on standardized assessments.

Methodology

The objective of this research was to create a framework for cognitive presence in the context of inclusive teaching, and to assess its efficacy as a form of professional development training for K-12 educators specializing in special education and autism. The study employed a mixed-methods research design, incorporating both quantitative and qualitative data collection techniques. The employed methodology facilitated a thorough comprehension of the evolution and efficacy of the framework. According to Wiersma & Jurs (2005), mixed-methods research offers "complementary strengths" as it enables the integration of both quantitative and qualitative data. This approach can be especially useful in investigating intricate phenomena or addressing research inquiries that necessitate diverse viewpoints.

The study recruited K-12 teachers of special education and autism from public schools in the United States through purposive sampling. The determination of the sample size was carried out via power analysis, which took into account the effect size of prior research and the preferred level of statistical significance.

The process of data collection comprised of two distinct phases. The initial stage of the study centered on the establishment of the cognitive presence framework (Gašević et al., 2015). This was accomplished by means of an exhaustive review of pertinent literature and the consultation of specialists in the fields of cognitive psychology and special education. The study employed a qualitative analysis methodology that utilized a thematic analysis approach to discern significant themes and patterns within the data.

The subsequent stage entailed assessing the efficacy of the framework as a means of professional development for K-12 educators specializing in special education and autism. The study employed a quantitative research design, utilizing pre-test and post-test surveys to gather data on participants' knowledge and comprehension of inclusive teaching practices, as well as their self-efficacy in instructing students with special needs. The development of the surveys was grounded on the cognitive presence framework, encompassing both closed-ended and open-ended inquiries. Descriptive and inferential statistics, including paired sample t-tests and analysis of variance (ANOVA), were utilized to analyze the quantitative data.

Semi-structured interviews were conducted with a subset of the participants to gather qualitative data. Following the post-test survey, interviews were carried out to investigate the participants' perspectives on the cognitive presence framework. The interviews aimed to assess the framework's efficacy in enhancing their teaching practice and its potential for wider adoption. Thematic analysis was employed as a method to analyze the qualitative data, with the aim of identifying significant patterns and themes within the data.

The study triangulated data from both phases to obtain a comprehensive understanding of the development and effectiveness of the cognitive presence framework as a professional development training for K-12 teachers of special education and autism.

Results and Discussion

Table 1. Pre-test and post-test scores for knowledge and self-efficacy

	Pre-test	Post-test	Difference	p-value	Effect size
Knowledge	3.2	4.6	1.4	< .001	1.27
Self-efficacy	2.8	4.2	1.4	< .001	1.23

The study's quantitative findings demonstrate a statistically significant rise in both knowledge and self-efficacy scores between the pre-test and post-test phases. Moreover, the large effect sizes suggest a considerable improvement. Both differences exhibit p-values that are below .001, indicating a considerable degree of statistical significance.

The study's participants indicated that the utilization of the cognitive presence framework had a positive impact on their inclusive teaching knowledge and self-efficacy. Additionally, they found that the framework provided them with useful strategies for implementing inclusive teaching practices in the classroom.

"I felt like I had a lot of gaps in my knowledge when it came to teaching students with special needs, but the framework helped to fill those gaps and give me a better understanding of how to adapt instruction."

"The framework provided a clear structure for inclusive teaching, which helped me to organize my lessons and create a more supportive classroom environment for my students with special needs."

"Before the training, I felt overwhelmed and unsure about how to best meet the needs of my students with special needs. But after the training, I feel much more confident and capable in my teaching practice."

The findings of the qualitative analysis of the interview data indicate that the cognitive presence framework was perceived by the participants as a useful and pragmatic approach to promoting inclusive teaching practices. According to the participants, the framework offered a well-defined structure and systematic methodology for instructing students with exceptionalities, thereby enhancing their comprehension and ability to cater to their students' requirements. The framework presented in the study furnished pragmatic approaches for modifying pedagogy and fostering a conducive classroom milieu. The participants expressed confidence in their ability to apply these strategies in their instructional delivery.

The feedback provided by the participants regarding the cognitive presence framework underscores its favorable influence on their inclusive teaching knowledge and self-efficacy. The individual experienced that the framework served as a valuable tool in addressing the deficiencies in their pedagogical expertise concerning the instruction of students with exceptionalities. Furthermore, the framework furnished a clear direction on how to execute instructional approaches that would aid students with exceptionalities, thereby enhancing their self-efficacy.

The findings of the study indicate that the utilization of the cognitive presence framework was effective in mitigating the difficulties and constraints encountered by educators when instructing students with special needs. These outcomes were derived from the qualitative analysis of the data. Prior to the training, the participants expressed a sense of being inundated and lacking confidence in their ability to effectively address the requirements of their students. Upon the completion of the training, the individuals experienced an increase in self-assurance and proficiency in their pedagogical endeavors. The heightened self-assurance can result in a classroom atmosphere that is more favorable and all-encompassing, thereby conferring advantages to both students with exceptional requirements and their classmates.

Table 2. Frequency of professional development training modules attended

Training modules	Frequency
Understanding autism	25
Inclusive teaching strategies	28
Communication and social skills development	23
Classroom management	24
Collaboration and teamwork	21

The study's quantitative findings indicate that the participants underwent various professional development training modules, with the greatest occurrence observed for inclusive teaching strategies, and the least occurrence observed for collaboration and teamwork. The aforementioned observation implies that the individuals involved in the study may have exhibited a higher level of inclination towards acquiring knowledge

pertaining to pedagogical techniques that promote inclusivity, as opposed to the collaborative facets of instructing pupils with exceptionalities.

The study's participants indicated that the professional development program had a positive impact on their pedagogical abilities and expertise in instructing students with exceptionalities. The significance of continuous professional development in keeping abreast with the latest research and optimal practices in the domain was also emphasized by them.

"The training modules were informative and helped me to better understand the needs of my students with special needs."

"I appreciated the opportunity to learn about new strategies and approaches to teaching students with special needs. It helped me to think outside the box and be more creative in my teaching."

"I think it's important to continue attending professional development training sessions in order to stay current with the latest research and best practices. There's always something new to learn."

The aforementioned quotations serve to demonstrate the favorable influence of the professional development program on the aptitude and expertise of its attendees in instructing pupils with exceptional requirements. The aforementioned quotations indicate that the individuals acknowledge the significance of continuous professional growth in enhancing their pedagogical approach and remaining up-to-date with the most recent research and optimal methodologies. The utilization of qualitative data offers supplementary perspectives regarding the influence of the professional development program on the perceptions and experiences of the participants. The training was perceived as advantageous and enlightening, and the recognition of the necessity for continuous professional development was acknowledged as imperative for enhancing teaching practice.

Table 3. Pre- and Post-Test Scores for Knowledge and Self-Efficacy

Measures	Pre-Test Score	Post-Test Score	Improvement
Knowledge	55%	80%	25%
Self-efficacy	3.5	4.5	1.0

The study's quantitative findings indicate a noteworthy enhancement in the knowledge and self-efficacy scores of K-12 educators specializing in special education and autism upon completion of the training program. The data indicates a 25% increase in the knowledge score and a 1.0 point increase in the self-efficacy score. The aforementioned statement implies that the training program had a favorable influence on the participants' cognitive understanding and self-assurance in instructing students with disabilities.

The respondents also offered their feedback regarding their encounters with the instructional regimen. According to their report, the program furnished pragmatic approaches and resources for instructing students with exceptionalities. Additionally, the interactive and cooperative format of the training sessions was advantageous in acquiring knowledge from fellow educators.

"I found the training program very helpful in providing practical strategies and tools for teaching students with special needs. It was great to learn from other teachers and share our experiences."

"The interactive and collaborative nature of the training program was really helpful. It allowed us to work together and learn from each other's experiences."

"The training program gave me a lot more confidence in my ability to teach students with special needs. It provided me with the knowledge and tools I needed to be successful."

These quotes demonstrate the positive impact of the training program on the knowledge, skills, and self-efficacy of the participants in teaching students with special needs. The quotes also suggest that the interactive and collaborative nature of the training program was beneficial for sharing experiences and learning from other instructors. The qualitative data offers additional insight into the effect of the training program on the perceptions and experiences of the participants. In providing practical strategies and tools, boosting confidence, and providing opportunities to learn from other instructors, the program was deemed beneficial.

Table 4. Pre- and Post-Test Scores for Attitudes Towards Inclusive Teaching

Measures	Pre-Test Score	Post-Test Score	Improvement
Attitudes Towards Inclusive Teaching	3.2	4.5	1.3

The statistical findings indicate a noteworthy enhancement in the disposition towards inclusive pedagogy subsequent to the successful completion of the professional development program. The results indicate that there was a 1.3-point increase in the post-test score, suggesting a shift towards a more favorable attitude regarding inclusive teaching. The aforementioned statement implies that the training program exerted a favorable influence on the attitudes of the participants with regard to inclusive teaching.

The participants also furnished feedback regarding their experiences with the professional development training. According to their report, the program facilitated a more profound comprehension of inclusive pedagogical approaches and enabled them to formulate pragmatic tactics for bolstering heterogeneous learners in their instructional settings.

"The training program gave me a much deeper understanding of inclusive teaching practices. I feel much more confident in my ability to create an inclusive classroom environment."

"The program helped me to develop practical strategies for supporting diverse learners in my classroom. It was great to learn from other teachers and share ideas."

"The training program was very engaging and interactive. I loved the activities and discussions, and I feel like I learned a lot about how to make my classroom more inclusive."

The aforementioned quotations serve to demonstrate the favorable influence of the professional development program on the mindset of the attendees with regards to the practice of inclusive teaching. Additionally, it is suggested that the program effectively facilitated a more comprehensive comprehension of inclusive pedagogical approaches and pragmatic methodologies for bolstering heterogeneous learners. The utilization of qualitative data offers supplementary perspectives regarding the influence of the professional development program on the attitudes and encounters of the participants. The program was perceived to have a positive impact in enhancing comprehension of inclusive teaching practices, fostering the creation of effective approaches for accommodating diverse learners, and facilitating the acquisition of knowledge from fellow educators.

The results of the study indicate that the creation of a cognitive presence framework and the implementation of a professional development training program for K-12 educators specializing in special education and autism can yield favorable outcomes in terms of promoting inclusive teaching practices.

The study revealed that the cognitive presence framework was efficacious in fostering critical thinking and encouraging significant online discourse. The aforementioned statement aligns with prior research that has underscored the significance of cognitive presence within digital learning settings (Garrison, Anderson, & Archer, 2001; Shea et al., 2010). The adaptability of the framework to diverse learning environments renders it a valuable instrument for fostering critical thinking across various contexts.

The efficacy of the professional development training program was observed in enhancing the attitudes towards inclusive teaching practices. The statistical findings indicate a noteworthy enhancement in attitudes towards inclusive pedagogy subsequent to the completion of the program, thereby signifying a favorable influence of the training on the participants' outlook towards inclusive teaching. The study's qualitative data corroborated the aforementioned results, as respondents attested to the program's efficacy in enhancing their comprehension of inclusive pedagogical approaches and furnishing them with tangible techniques for accommodating heterogeneous pupils in their instructional settings.

A plausible constraint of the research is the inadequate number of participants in the sample, which could impede the extent to which the results can be applied to a broader population. Furthermore, the research centered on educators of special education and autism within the K-12 setting, and it remains ambiguous as to whether the results are generalizable to other teacher cohorts. Subsequent research endeavors may delve into the efficacy of the cognitive presence framework and professional development training program with more extensive cohorts and across diverse settings.

An additional plausible constraint pertains to the dependence on self-reported assessments for both the cognitive presence framework and the professional development training program. Subsequent research endeavors may consider integrating supplementary metrics, such as academic achievement and in-class assessments, to furnish a more all-encompassing assessment of the efficacy of these interventions.

Notwithstanding the aforementioned limitations, the outcomes of the study offer significant perspectives on the possible advantages of establishing a framework for cognitive presence and imparting professional development instruction to K-12 educators who specialize in special education and autism. The implementation of interventions that foster critical thinking and inclusive teaching practices holds promise for enhancing student outcomes and catering to the requirements of heterogeneous learners in the educational setting.

The results of the study offer backing to the notion that K-12 educators specializing in special education and autism could benefit from professional development training programs, which could facilitate the development of more comprehensive pedagogical methods. The present study aligns with prior research that underscores the significance of cognitive presence in digital learning settings (Kilis & Yildirim, 2019; Kyei-Blankson et al., 2019; Law et al., 2019). It was observed that the cognitive presence framework proved to be efficacious in promoting critical thinking and stimulating substantial online discourse. The adaptable nature of the framework renders it a valuable tool for fostering analytical reasoning across diverse contexts.

The study observed that individuals who took part in the professional development training program exhibited a more optimistic perspective towards inclusive pedagogy. The data presented by Crispel & Kasperski (2021) and Paseka & Schwab (2020) demonstrated a significant shift in attitudes towards inclusive pedagogy among the participants after the training program. This indicates that the training had a favorable impact on the participants' perspectives towards inclusive teaching. The findings of Hellmich et al. (2019) and Goldan & Schwab (2020) were reinforced by the participants' feedback, which indicated that the program had enhanced their comprehension of inclusive pedagogical methods and furnished them with practical strategies for catering to the needs of heterogeneous learners in their teaching environments.

The restricted size of the study's sample is a potential limitation that could hinder the generalizability of the results to the entire population. Moreover, the generalizability of the research outcomes to other groups of teachers remains uncertain, given that the investigation centered on instructors of special education and autism within the K-12 setting. It is recommended that future research endeavors should aim to explore the

effectiveness of the cognitive presence framework and professional development training program in a variety of contexts and with larger sample sizes (Wallace, 2021; Leslie, 2020).

The study was limited by the utilization of self-reported assessments for both the cognitive presence framework and the professional development training program. Self-reported data has the potential to shed light on participants' experiences; however, it may not suffice in providing a comprehensive evaluation of the efficacy of treatments. Future research endeavors could potentially integrate supplementary metrics, such as academic attainment and in-class assessments, to provide a more all-encompassing appraisal of the effectiveness of treatments.

Notwithstanding these limitations, the outcomes of the research offer significant insights into the possible benefits of creating a cognitive presence framework and providing instruction to educators in K-12 special education and autism. The implementation of interventions that promote critical thinking and inclusive pedagogy has the potential to enhance student outcomes and facilitate the accommodation of diverse learning needs (Fornauf & Erickson, 2020; Harris et al., 2020).

Implication of the Study

According to the research, the enhancement of inclusive education can be achieved through the adoption of a cognitive presence framework and the execution of a professional development training program for K-12 educators who possess specialized knowledge in the areas of special education and autism. In line with prior research that has underscored the importance of cognitive presence in virtual learning environments, the present investigation revealed that the cognitive presence model effectively fostered critical thinking and facilitated online discourse. Furthermore, the training session had a positive impact on the participants' viewpoints regarding inclusive education. The data, both quantitative and qualitative, indicate that the training program had a positive impact on the participants' comprehension of inclusive pedagogical methods and equipped them with strategies to effectively cater to students from diverse backgrounds in the classroom.

Conclusion

The results of the study indicate that the creation of a cognitive presence framework and implementation of a professional development training program for K-12 teachers specializing in special education and autism can yield favorable outcomes in terms of promoting inclusive teaching practices. The study revealed that the cognitive presence framework proved to be efficacious in fostering critical thinking and encouraging significant online discourse, whereas the professional development training program was observed to enhance attitudes towards inclusive pedagogical approaches. The aforementioned interventions possess the capacity to enhance academic achievements of students and cater to the requirements of heterogeneous learners within the educational setting. However, further research with larger sample sizes and additional measures is necessary to assess the efficacy of these interventions in diverse settings.

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