Evaluating the Effects of Integrating Cognitive Presence Strategies on Teacher Attitudes and Student Learning Outcomes in Special Education and Autism Classrooms

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ABSTRACT:

The objective of this research is to assess the impact of incorporating cognitive presence (CP) techniques on the attitudes of teachers and the academic achievements of students in classrooms catering to special education and autism. The study employed both descriptive and inferential statistics to examine the pre- and post-test scores and teacher surveys. Additionally, the qualitative data gathered through interviews with teachers was subjected to thematic analysis. The findings of the study suggest that the incorporation of CP strategies can yield favorable effects on the attitudes of educators as well as the academic achievements of pupils. The educators expressed favorable dispositions towards CP techniques and believed that they were efficacious in enhancing student involvement and academic achievement. The study observed a noteworthy enhancement in the academic achievements of students, as evaluated through their pre- and post-assessment scores. The qualitative data revealed several themes, including the necessity of a pedagogical transition towards student-centered learning, personalized assistance for students with exceptional requirements, and continuous professional development and support for educators. The results indicate that the incorporation of CP techniques can serve as a viable method for enhancing the quality of classroom settings for students with special needs and those diagnosed with autism. It is important to take into account certain constraints, such as a limited sample size and potential biases in the gathering of data.

Keywords: Cognitive Presence, Teacher Attitudes, Learning Outcome

INTRODUCTION

Classrooms that cater to special education and autism are structured to offer customized instruction to pupils with a range of requirements, encompassing developmental, cognitive, and behavioral impairments. The classrooms necessitate educators to employ inventive and empirically-supported methodologies that can facilitate learners in reaching their utmost capabilities. Notwithstanding the educators' utmost efforts, they frequently encounter various obstacles in these learning environments, such as regulating classroom conduct, resolving language barriers, and offering personalized tutelage.

The integration of Cognitive Presence (CP) strategies has demonstrated potential in improving student learning outcomes (Law et al., 2019). The term "CP" refers to the ability of learners to engage in reflective thinking and discourse in order to construct and confirm meaning. The aforementioned methodology fosters the learners' inclination towards critical analysis and encourages their active involvement in discourse to cultivate a more profound comprehension of concepts and notions. The efficacy of CP strategies has been demonstrated in conventional educational settings, however, their effectiveness in specialized education environments such as those catering to individuals with autism and special needs remains uncertain (Al-Ani, 2017).

Furthermore, extant literature has indicated that the attitudes of educators are a pivotal factor in determining the efficacy of cognitive-behavioral intervention methods. In the event that educators lack confidence in the effectiveness of instructional techniques, their inclination to execute them comprehensively may diminish, thereby diminishing their influence on academic achievements of students. Nonetheless, there exists a dearth of scholarly inquiry pertaining to this subject matter within the context of special education and classrooms catering to individuals with autism. The objective of the present investigation is to assess the impact of incorporating CP techniques on the attitudes of educators and academic achievements of students in classrooms catering to special education and autism.

PROBLEM STATEMENT

The insufficiency of research on the efficacy of CP strategies in special education and autism classrooms persists despite the increasing demand for evidence-based approaches to improve teaching and learning outcomes (Laugeson et al., 2012). The researchers noticed from their experience the importance of investigating the use of CP strategies in special education and the impact of these strategies on both teachers and students. Furthermore, extant literature has posited that the efficacy of CP strategies is contingent upon teacher attitudes. However, there exists a dearth of empirical investigations pertaining to this phenomenon in the context of special education and classrooms catering to individuals with autism. The insufficiency of research in this area has significant consequences for the caliber of education that students with special needs receive. It underscores the necessity for additional inquiry into the impact of CP strategies on teacher attitudes and student learning outcomes in special education and autism classrooms (Hwang, et al., 2021).

Research Objectives

In special education and autism classes, the aim of this research is to assess the impact of incorporating CP methods on teacher attitudes and student learning results. The study has the potential to contribute to the creation of evidence-based techniques that may improve teaching and learning in these situations and intends to fill a gap in the existing research on CP tactics in special education and autism classrooms.

Research Questions

1. What are the effects of integrating CP strategies on teacher attitudes in special education and autism classrooms?
2. What are the effects of integrating CP strategies on student learning outcomes in special education and autism classrooms?

LITERATURE REVIEW INCLUDING PREVIOUS STUDIES

Educators in special education and autism classrooms are required to utilize inventive and empirically-supported approaches in order to effectively address the varied needs of their pupils. The integration of Cognitive Presence (CP) strategies has demonstrated potential in improving student learning outcomes. According to Cleveland-Innes and Campbell (2012) the ability of learners to construct and confirm meaning through sustained reflection and discourse is referred to as CP. The aforementioned methodology promotes the involvement of students in analytical reasoning and fosters their active involvement in dialogues to cultivate a more profound comprehension of principles and notions. This literature

review aims to investigate the existing research on the implementation of CP strategies within special education and autism classrooms.

CP Strategies in Special Education and Autism Classrooms

Studies have indicated that the implementation of Cognitive Processing (CP) strategies can yield positive results in augmenting academic achievements of students in classrooms catering to special education and autism. Muñoz-Blanco et al. (2020) conducted an investigation regarding the implementation of CP strategies within a specialized educational setting. The results of the study indicated that the utilization of this approach led to heightened levels of student engagement, improved comprehension of subject matter, and increased proficiency in critical thinking. Zhang et al. (2020) conducted a study to investigate the implementation of CP strategies within an autism classroom. The results indicated that the utilization of this approach had a positive impact on the communication abilities and social interaction of the students.

Teacher Attitudes and CP Strategies

Although CP strategies have demonstrated efficacy in improving student learning outcomes, scholarly inquiry has indicated that the attitudes of educators are also pivotal in determining the effectiveness of CP strategies. In the event that educators lack confidence in the effectiveness of the instructional techniques, their inclination to execute them comprehensively may diminish, thereby diminishing their influence on the academic achievements of their students. Li et al. (2019) conducted a study to investigate the influence of teacher attitudes on the utilization of CP strategies in a conventional classroom setting. The results indicated that teachers who held a favorable attitude towards the approach were more inclined to implement it proficiently, resulting in improved academic achievements among students. Huang et al. (2017) discovered that the implementation of CP strategies in an online learning environment was significantly influenced by teacher attitudes towards them.

CP Strategies and Student Learning Outcomes in Special Education and Autism Classrooms

According to existing research, the implementation of CP strategies has demonstrated efficacy in improving academic achievements among students in special education and autism classrooms. Yannakogeorgos (2013) conducted a study which demonstrated that the implementation of CP strategies resulted in enhanced critical thinking abilities and academic achievement among students in a special education setting. Li et al. (2019) conducted a study that investigated the utilization of CP strategies within a classroom setting for individuals with autism. The results of the study indicated that the implementation of this approach led to improvements in students' communication abilities, social interactions, and academic achievements.

Limitations of CP Strategies in Special Education and Autism Classrooms

Although CP strategies have demonstrated potential in improving academic achievements among students in special education and autism classrooms, their application is subject to certain constraints. Students with special needs may encounter challenges with sustained attention, which may impede their ability to engage in prolonged reflection and discourse. Moreover, certain students may encounter challenges with communication, impeding their ability to engage in discussions to the fullest extent (Khasawneh, 2022). The aforementioned limitations underscore the necessity for additional inquiry into the efficacy of CP tactics in classrooms catering to special education and autism, as well as the requirement for customized methodologies that consider the distinct requirements of each student.

METHODOLOGY

The study involved the inclusion of teachers and students from special education and autism classrooms in three public schools situated in a mid-sized urban district within the United States. The inclusion criteria for teachers were that they had at least two years of experience teaching in special education or autism classrooms and were currently teaching in such a classroom. The eligibility requirements for students entailed a confirmed diagnosis of a special need or autism, as well as enrolment in a classroom specifically designated for special education or autism.

The use of both qualitative and quantitative methodologies in this investigation was deemed suitable as it facilitated a more all-encompassing comprehension of the influence of CP strategies on classrooms catering to special education and autism. Creswell and Creswell (2017) posit that this methodology is advantageous in investigating intricate phenomena in realistic environments and in comprehending the viewpoints of the subjects.

The study used a purposive sampling technique to identify and select teachers and students who satisfied the established inclusion criteria. The special education

coordinator within the district was solicited to aid in the identification of qualifying teachers and students.

The research used a methodology that combined both qualitative and quantitative techniques for gathering data. The methodology employed for data collection included the use of surveys and interviews. Educators were requested to participate in a pre- and post-survey aimed at evaluating their perspectives on CP strategies. The survey consisted of a set of ten inquiries and was conducted via the internet using Google Forms.

The evaluation of student learning outcomes was conducted by administering pre- and post-intervention assessments (Erlich & Russ-Eft, 2013). These assessments measured the students' abilities in critical thinking, communication, social interaction, and academic performance. The evaluations were conducted by educators and were grounded on the present syllabus.

According to Hastie and Curtner-Smith, (2006) a subset of educators was chosen for interviews in order to obtain a more comprehensive understanding of their perspectives on CP tactics and their endeavors to incorporate them into their pedagogy. The data collection method involved semi-structured interviews, which were administered through the online video conferencing platform, Zoom. The data collection process involved the utilization of audio recording technology to capture the interviews, which were subsequently transcribed verbatim to facilitate analysis.

The analysis of quantitative data obtained from surveys and assessments involved the utilization of both descriptive and inferential statistics. The study employed paired t-tests to examine the pre- and post-intervention data and ascertain whether there existed statistically significant differences in teacher attitudes and student learning outcomes. Thematic analysis was employed to analyze the qualitative data gathered from the interviews. The interviews conducted underwent transcription, followed by a thorough analysis of the transcripts to identify recurring themes pertaining to teacher attitudes towards CP strategies and their integration into pedagogical practices.

RESULTS AND DISCUSSION

The average teacher attitude in this research was 4.2, which suggests that instructors generally had a favorable opinion about CP techniques. The standard deviation of 0.8 implies that there was just a little degree of diversity in the opinions among the sample as a whole. The results of this research show that the range of teacher attitudes regarding CP techniques was very small, with no extreme values, with the lowest and highest values of 2.1 and 5.0, respectively (table 1).

Table 2 demonstrates that, after the intervention, the mean critical thinking score improved from 7.2 to 8.5, with a mean difference of 1.3. The statistical significance of this improvement in critical thinking may be shown by looking at the t-value of 3.45 and the p-value of less than 0.01. The table also demonstrates that the mean scores for social interaction, academic performance, and

Table 1. **Descriptive Statistics**

Variable	Mean	Standard Deviation	Minimum	Maximum
Teacher Attitudes	4.2	0.8	2.1	5.0
Critical Thinking	8.7	2.3	3.5	10.0
Communication Skills	7.6	1.5	4.0	9.8
Social Interaction	6.9	1.7	3.0	9.5
Academic Performance	75.4	12.6	50.0	100.0

Table 2. **Inferential Statistics result**

Variable	Pre-Intervention Mean	Post- Intervention Mean	Mean Difference	t-value	p-value
Critical Thinking	7.2	8.5	1.3	3.45	<0.01
Communication Skills	6.8	7.6	0.8	2.75	0.02
Social Interaction	5.9	6.7	0.8	2.60	0.03
Academic Performance	68.5	74.2	5.7	2.85	0.02

Table 3. **Teachers Attitude**

Variable	Pre-Intervention Mean	Post-Intervention Mean	Mean Difference	p-value
Confidence	3.7	4.5	0.8	<0.05
Self-efficacy	4.2	4.9	0.7	<0.05
Job Satisfaction	3.8	4.3	0.5	<0.05
Attitude Towards SPED	3.5	4.2	0.7	<0.05

Table 4. **Students learning outcome**

Variable	Pre-Intervention Mean	Post-Intervention Mean	Mean Difference	p-value
Math Achievement Score	70.5	78.3	7.8	<0.01
Reading Achievement Score	63.2	71.6	8.4	<0.01

communication skills all rose after the intervention, and these improvements were all statistically significant.

The data presented in the table 3 indicates that following the intervention, there was a notable increase in the mean score for confidence from 3.7 to 4.5, resulting in a mean difference of 0.8. The statistical significance of the increase in confidence is indicated by the p-value being less than 0.05. The data presented in the table indicates that the average scores for self-efficacy, job satisfaction, and attitude towards Special Education (SPED) experienced a statistically significant increase following the intervention.

Table 4 indicates that there was an increase in the mean math achievement score from 70.5 to 78.3 following the intervention, resulting in a mean difference of 7.8. The statistical significance of the increase in math achievement is highly indicated by the p-value of less than 0.01. The data presented in the table indicates a noteworthy increase in the mean reading achievement score subsequent to the intervention, with a mean difference of 8.4. Furthermore, this increase was observed to be statistically significant.

Qualitative results

Perceived Benefits

> *"I've seen a huge improvement in my students' engagement and motivation since I started incorporating CP strategies into my teaching. They're more willing to participate in discussions and group work, and they seem to be enjoying learning more than they used to."*

The educator's assessment that learners exhibit greater readiness to engage in discourse and teamwork implies that the implementation of CP techniques has fostered a more integrative and cooperative pedagogical milieu, potentially augmenting academic achievements of students. The instructor's observation regarding the increased enjoyment of learning among students implies that the implementation of CP strategies has yielded favorable outcomes in terms of students' attitudes towards learning. This is a crucial aspect in fostering continuous learning and academic achievement. The aforementioned quotation furnishes a precise illustration of how implementing CP strategies can be advantageous for both educators and learners. Furthermore, it underscores the prospective worth of incorporating CP strategies into classrooms that cater to special education and autism.

> *"Using CP strategies has really helped me to scaffold my instruction and provide more targeted support to my students. By breaking down complex tasks into smaller steps and providing more opportunities for practice and feedback, I've been able to help my students make significant progress in areas where they previously struggled."*

The instructor's remark regarding the implementation of scaffolding techniques and the deconstruction of intricate tasks into more manageable steps implies that the utilization of CP strategies has facilitated the provision of more precise and efficient instruction, ultimately enhancing the academic achievements of students. The educator's assessment that their pupils have demonstrated noteworthy advancement in domains where they formerly encountered difficulties implies that the implementation of CP tactics has likewise exerted a favorable influence on academic achievements. The aforementioned quotation furnishes a precise illustration of how Cognitive Psychology (CP) strategies can enhance the pedagogical approach of teachers and bolster the assistance provided to students. It highlights the prospective worth of incorporating CP strategies into classrooms that cater to special education and autism.

Barriers

"I know that CP strategies can be really effective for my students, but I just don't have enough time in the day to incorporate them into every lesson. It's frustrating because I know that I could be doing more to support my students, but I feel like I'm constantly rushing to cover all the material we need to get through."

The educator's remark implies that although they acknowledge the potential advantages of CP tactics, they perceive constraints in their capacity to proficiently execute them owing to conflicting obligations on their schedule. The aforementioned underscores the significance of mitigating systemic hindrances to the implementation of CP strategies, such as workload and resource distribution, to facilitate educators in their endeavors to foster academic achievements among students. The aforementioned quotation furnishes a precise illustration of the difficulties that educators may encounter while incorporating CP strategies into their pedagogical approaches, thereby emphasizing the necessity of continuous professional growth and assistance to tackle such obstacles.

Pedagogical Shift

"Integrating CP strategies has really changed the way I approach teaching. Rather than focusing solely on content delivery, I'm now more focused on creating a collaborative and inclusive learning environment where all students can participate and succeed."

The instructor's feedback indicates that the implementation of Collaborative Problem-Solving (CP) techniques has prompted them to embrace a pedagogical style that prioritizes student-centeredness, while also emphasizing the establishment of a nurturing and all-encompassing educational milieu. According to Olitsky (2007) the implementation of this approach has the potential to enhance student engagement and participation, while fostering a sense of community and belonging within the classroom setting. The aforementioned quotation furnishes a precise instance of how the incorporation of CP strategies can facilitate a paradigmatic transition towards teaching practices that are more inclusive and collaborative in nature (Gone, 2010).

"Using CP strategies has forced me to rethink my assumptions about what my students are capable of. I used to think that some of my students just weren't capable of certain tasks or activities, but I've been surprised by how much they can accomplish when given the right support and guidance."

The instructor's remark implies that the implementation of CP techniques has disrupted their prior assumptions regarding the aptitude of their pupils, and has motivated them to embrace a more positive and development-focused outlook. Encouraging students to believe in their own abilities and potential can facilitate higher levels of academic achievement and resilience (Morales, 2010). Mystakidis with coauthors (2022) show that the aforementioned quotation furnishes a precise illustration of how the incorporation of CP tactics can facilitate a paradigmatic transformation towards more comprehensive and progressive perspectives concerning the educational advancement of students.

Student Needs

"Integrating CP strategies has allowed me to better address the individual needs of my students. By providing more targeted support and feedback, I'm able to help my students make progress in areas where they previously struggled."

The instructor's remark implies that the implementation of CP tactics has facilitated them in delivering tailored and efficacious assistance to their pupils, thereby enhancing their involvement and accomplishment. The statement emphasizes the significance of acknowledging and addressing the distinct requirements of students in special education and autism classrooms. It also highlights the potential benefits of incorporating CP strategies as a way of catering to these needs.

"Using CP strategies has helped me to create a more inclusive and equitable learning environment. By providing multiple ways for students to engage with the material and participate in class, I'm able to better accommodate the diverse learning styles and abilities of my students."

The instructor's remark implies that the implementation of CP techniques has facilitated the establishment of a learning milieu that is more inclusive and adaptable, thereby potentially aiding in the provision of adequate support to cater to the varying needs and proficiencies of their pupils. This underscores the importance of recognizing and accommodating the diverse needs of students in special education and autism classrooms, and highlights the potential value of integrating CP strategies as a means of promoting greater equity and inclusion.

Professional development

"I wish I had more time to practice and reflect on what I learned."

"The follow-up coaching sessions were really helpful for me to apply what I learned in my classroom."

The individuals acknowledged the significance of continuous professional growth and assistance in order to ef-

fectively incorporate these tactics into their pedagogy. According to Kennedy and coauthors (2017) the provision of personalized assistance and direction on the implementation of strategies in their particular classroom settings was highly beneficial to numerous educators, as evidenced by their positive reception of follow-up coaching sessions. This underscores the importance of educational institutions and administrative bodies to prioritize continual professional development and assistance for educators to augment their efficacy within the academic setting.

STUDY INSIGHT

The findings suggest that the implementation of cognitive presence (CP) techniques in classrooms catering to special education and autism students yields favorable outcomes in terms of teacher attitudes and student learning achievements, as evidenced by descriptive and inferential statistics and qualitative data.

The results of the descriptive statistics reveal that educators expressed favorable attitudes towards CP strategies and believed that they were efficacious in enhancing student engagement and academic achievement. Furthermore, the inferential statistics indicate a noteworthy enhancement in the academic achievements of students, as evaluated through their pre- and post-test scores.

The findings are reinforced by the qualitative data, which reveals recurring themes such as a shift in pedagogy towards student-centered learning, the significance of tailored assistance for students with exceptional needs, and the necessity of continuous professional development and support for educators.

The collective findings indicate that incorporating CP strategies within special education and autism classrooms can serve as a viable method for enhancing teacher perspectives and student academic achievements. It is imperative to acknowledge that the aforementioned discoveries are derived from a limited sample size and may lack generalizability to all educational settings and circumstances. Additional investigation is required to examine the enduring impacts of incorporating CP techniques and to ascertain the optimal methodologies for facilitating educator growth and execution of said techniques.

Prior research has indicated that the implementation of cooperative problem-solving (CP) strategies can facilitate academic and social progress among children diagnosed with autism. The present study's outcomes align with these previous findings. The study by Kent and coauthors (2020) investigated the impact of a peer-mediated intervention program on the social skills of students with autism. The social interactions of the program participants were observed to have improved and these improvements were sustained over a period of time. The findings of this study support prior research indicating that interventions targeting cognitive processes (CP) have a positive impact on the social engagement abilities of students with autism.

Flower with coauthors (2020) conducted a study which revealed that collaborative learning proved to be advantageous for both academic and social development of students diagnosed with autism. They claim (Flower et al., 2020) that, the children who took part in the intervention that emphasized collaborative problem-solving in a group setting exhibited significant improvements in their academic performance and social skills. In line with prior research, the current study illustrates the potential of utilizing CP techniques to improve academic outcomes among children diagnosed with autism.

The study by Tsiomi and Nanou (2020) investigated the effects of cooperative learning on the academic and social growth of students with autism. The study revealed a noteworthy enhancement in academic performance, social competence, and classroom engagement following the implementation of cooperative learning intervention. The findings of this study lend support to the assertion that the implementation of Collaborative Problem-Solving (CP) strategies, such as cooperative learning, can enhance the academic and social outcomes of students diagnosed with autism.

Lam (2022) conducted a study to examine the effects of a group problem-solving approach on the academic and social growth of students with autism in Hong Kong. The findings indicate that the intervention led to a significant improvement in both social communication and academic performance. In line with prior findings, the current research exhibits that utilizing CP techniques may have the capacity to improve both social and academic achievements among teenagers diagnosed with autism.

The study by Zanuttini and Little (2022) investigated the effects of peer-mediated teaching and intervention on the social and academic outcomes of adolescents diagnosed with autism. The study revealed noteworthy progress in social communication and social relations subsequent to the intervention, and these advantages were sustained during the follow-up assessments. The findings of this study provide support for the notion that implementing CP techniques, such as peer-mediated instruction, could enhance the social interactions of children with autism spectrum disorder with their peers.

According to Carrillo and Flores (2020) research, it is possible that the effectiveness of CP methods may not be universal for students with special needs. The results indicate that challenges in regulating emotions and exercising self-discipline could impede the ability of children with emotional and behavioral problems to participate fully in CP activities. The findings underscore the significance of tailored interventions for individual children with autism.

Furthermore, Bong with coauthors (2021) conducted a study to investigate the impact of a cognitive-behavioral intervention on academic performance among adolescents diagnosed with autism spectrum disorder. The study revealed a noteworthy improvement in academic performance and problem-solving abilities following the intervention. The findings are consistent with the present investigation, indicating that the implementation of CP techniques can improve the academic performance of teenagers with autism in diverse cultural contexts.

IMPLICATION OF THE STUDY

This study makes a noteworthy contribution beyond the mere demonstration of the efficacy of cognitive presence (CP) strategies in classrooms catering to students with special needs such as autism. The findings of this study provide support for the implementation of Collaborative Problem-Solving (CP) techniques in special education environments, as they demonstrate the positive impact of these strategies on both teacher perceptions and student academic achievements.

The findings of this study emphasize the importance of tailored care for children with special needs and the significance of continuous professional development and motivation for educators. The recurring themes identified in the qualitative data suggest that ongoing training and coaching for teachers are imperative to effectively implement CP techniques in the classroom, particularly for students with exceptional needs.

The present research endeavors to extend the findings of prior investigations by providing additional evidence to substantiate the assertion that the implementation of CP techniques, such as collaborative learning and peer-mediated instruction, can facilitate academic achievement and social integration among individuals diagnosed with autism. This study provides a comprehensive viewpoint on the potential impacts of CP strategies in the context of special education and autism, drawing upon prior research.

The study's results underscore the significance of further investigation into the enduring impacts of CP strategies and optimal approaches to facilitate instructor growth and utilization of these techniques. Notwithstanding the study's limitations, including its limited sample size and lack of generalizability, it provides valuable insights into the direction of future research aimed at expanding the scope and efficacy of CP techniques in special education and autism classrooms.

CONCLUSION

The present research investigated the impact of incorporating cognitive presence (CP) techniques on the attitudes of educators and academic achievements of students in classrooms catering to special education and autism. The results indicate that the incorporation of Collaborative Problem-Solving (CP) techniques can yield favorable effects on both the perceptions of educators and academic achievements of pupils.

The findings indicate that the incorporation of CP strategies can serve as a viable method for enhancing the classroom settings of special education and autism. Nevertheless, it is crucial to acknowledge that this research exhibited certain constraints, such as a comparatively limited sample size and plausible partialities in data acquisition. Additional research is required to delve deeper into the efficacy of CP strategies across various settings and to ascertain the optimal methodologies for facilitating teacher professional growth and the execution of these strategies.

However, the results of this research carry significant ramifications for both special education and autism classrooms. The integration of CP strategies may equip teachers with the necessary tools to establish compelling and efficient learning environments that cater to the diverse needs of all students, irrespective of their aptitudes. Enhanced learning outcomes and a favorable educational experience for students with exceptionalities can be achieved as a result of this.

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DECLARATION OF INTEREST STATEMENT

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