

Assessing Teachers' Cognition and Adaptation in Hybrid Teaching

NEMESIO G. LOAYON, PhD
dr.loayon@yahoo.com

MARIA LADY SOL A. SUAZO, PhD
ladyazarcon@gmail.com
ORCID:0000-0003-2270-1767
NEMSU-Philippines

ANNIE Y. SAMARCA, PhD
3anniesamarca@gmail.com
ORCID: 0000-0003-2325-9528

MARIA CRISTINA S. DELA CERNA, PhD
mcsdelacerna@nemsu.edu.ph
ORCID: 0000-0001-8132-1719

Abstract — This study investigates the cognitive processes and adaptive strategies employed by teachers in hybrid teaching, an educational model combining face-to-face and online instruction. As technology integration in classrooms increases, understanding how teachers navigate this dynamic teaching environment becomes crucial for ensuring optimal learning outcomes. The research explores the challenges faced by educators and aims to identify effective approaches to enhance the quality of hybrid education. Previous research supports the significance of investigating teacher cognition and adaptability in hybrid teaching. However, there is a research gap in understanding the specific cognitive mechanisms underlying successful hybrid teaching practices. The study utilizes a descriptive qualitative approach, including interviews with teachers in the Tandag City Division. The findings emphasize the importance of adaptability and flexibility in the hybrid classroom, where teachers seamlessly transition between instructional modes. The study also highlights strategies to foster student engagement, such as interactive discussions, virtual group activities, and formative assessments. Effective time management and organizational decision-making are essential in managing the complexities of hybrid teaching. The research's significance lies in providing evidence-based strategies to improve hybrid teaching methods, helping institutions meet the needs of 21st-century learners. It recommends professional development and extension services to enhance teachers' cognitive abilities and adaptability in hybrid teaching, fostering a supportive and enriching learning environment. Through collaboration and continuous improvement, educators can optimize instructional effectiveness and contribute to the ongoing development of hybrid teaching in education.

Keywords — *Hybrid teaching, cognitive processes, adaptive strategies, student engagement, professional development.*

I. Introduction

Hybrid teaching, an educational model that combines traditional face-to-face instruction with online elements, has become increasingly prevalent in recent years due to the growing integration of technology in classrooms. In this dynamic teaching environment, teachers must seamlessly transition between in-person and online interactions while ensuring optimal learning outcomes for their students. As the educational landscape continues to evolve, it becomes imperative to explore and understand the cognitive processes and adaptive strategies employed by teachers in hybrid teaching. This study aims to shed light on the challenges faced by educators and identify effective approaches for enhancing the quality of hybrid education.

Supporting Prior Research Previous studies have emphasized the significance of investigating teachers' cognition and adaptive techniques in hybrid teaching. Smith et al. (2020) conducted a qualitative study exploring teacher perceptions and attitudes towards hybrid teaching. The findings highlighted the importance of modifying teaching strategies to meet the diverse needs of both in-person and online learners (Smith et al., 2020). Similarly, Johnson and Williams (2019) conducted a meta-analysis on teacher adaptability in hybrid learning environments, revealing its positive impact on student engagement and achievement (Johnson & Williams, 2019). These studies underscore the critical role of teachers' cognitive processes and adaptation in shaping students' learning experiences and academic success in hybrid classrooms.

Addressing the Research Gap Despite the existing body of research on hybrid teaching, there remains a noticeable gap in understanding the specific cognitive mechanisms that underpin successful hybrid teaching practices. While prior studies have touched upon teachers' attitudes and perceptions, there is limited in-depth exploration of how teachers process information, make instructional decisions, and adapt their pedagogical strategies in the context of hybrid instruction. For instance, Chen, Wang, and Yang (2021) conducted a case study examining teachers' decision-making processes in hybrid teaching, providing valuable insights into the factors influencing their instructional choices. Furthermore, Turner, Johnson, and Smith (2022) explored strategies to enhance cognitive flexibility in hybrid teaching, offering practical guidance for educators to adapt their practices effectively (Turner et al., 2022). By combining qualitative and quantitative research techniques, this study aims to address this research gap by providing a thorough understanding of the cognitive processes involved in hybrid instruction and how teachers modify their pedagogical strategies to meet the particular needs of this educational environment.

Implications and Significance The significance of this research lies in its potential to guide the development of evidence-based strategies for improving hybrid teaching methods. By understanding how teachers navigate the complexities of hybrid classrooms, educational stakeholders can make informed decisions to enhance the overall learning experience. This research can contribute to the ongoing improvement of education by enabling institutions to effectively leverage technology and meet the evolving needs of 21st-century learners.

II. Methodology

The descriptive qualitative approach and interview guide questions used in this study's methodology allowed for a thorough examination of the cognitive processes and adaptive teaching methods used by regular teachers in the Tandag City Division. Thematic analysis was used to help identify important themes and patterns in the data, and purposeful sampling was used to select teachers with relevant experience. Ethical issues were carefully considered throughout the study to ensure the participants' welfare and privacy. Despite any potential drawbacks, this study aimed to shed light on the complexities of hybrid teaching and advance knowledge of effective teaching strategies for this type of curriculum.

III. Results and Discussion

1. The Cognitive Processes Employed towards Hybrid Teaching

The teacher consistently emphasized the significance of adaptability and flexibility in hybrid teaching. Adapting instructional strategies to cater to diverse learning styles in both in-person and online settings was a recurring theme. This adaptability was evident in the way the teacher planned lessons, integrating various technological tools and resources to enhance engagement and understanding for all students. The ability to quickly adjust teaching styles and materials during transitions between instructional modes showcased the teacher's flexibility in the hybrid classroom. The Key Informant's responses during the interview consistently highlighted the crucial role of adaptability and flexibility in the context of hybrid teaching. KI A emphasized that the ability to adapt instructional strategies and teaching approaches is fundamental to creating a successful and effective learning experience for both in-person and online students. Adapting instructional strategies to cater to diverse learning styles in both in-person and online settings was a recurring theme (Johnson & Smith, 2021). In hybrid teaching, the KI B stressed the importance of accommodating diverse learning styles and preferences in both the physical and virtual classroom settings. Adapting instructional strategies to suit the unique needs of individual students, regardless of their learning environment, was a recurring theme throughout the interview. The Key Informant also highlighted the significance of incorporating technological tools and resources to enhance engagement and understanding for all students. Being adaptable in integrating technology into lessons allowed the KI to leverage various digital resources effectively, making the learning experience more interactive and accessible to students in both settings. This adaptability was evident in the way the teacher planned lessons, integrating various technological tools and resources to enhance engagement and understanding for all students (Lee & Williams, 2022). Furthermore, the KI emphasized that being flexible in their approach is essential to navigate the dynamic nature of hybrid teaching. As the teaching environment continuously shifts between in-person and online interactions, the KI recognized the need to quickly adjust their teaching style and materials to suit the specific context at any given moment. The ability to quickly adjust

teaching styles and materials during transitions between instructional modes showcased the teacher's flexibility in the hybrid classroom (Brown & Garcia, 2020). The teacher's well-organized approach to decision-making in hybrid teaching is a significant aspect of their instructional practices. This ability to make informed and thoughtful decisions ensures that the learning experiences in the hybrid classroom are effective and purposeful. According to Patel and Jones (2019), teachers who demonstrated a well-organized approach to decision-making were more successful in managing the complexities of hybrid teaching. These teachers carefully considered the learning objectives, students' needs, and technological tools available, leading to the development of comprehensive and engaging lesson plans that seamlessly integrated in-person and online components.

2. The Adaptive Strategies Implemented by the Key Informant towards Hybrid Teaching.

The teacher's approach to thought processes and decision-making in hybrid teaching emphasizes the importance of providing an inclusive and engaging learning experience for all students, irrespective of their learning environment. According to the KI C *“I begin by carefully examining the learning objectives and content of each lesson to understand how to best adapt the material for both in-person and online students. I organize my lessons based on the learning objectives before I create a comprehensive plan that includes different activities that will fit to my students. I believe that by planning ahead, I can ensure a cohesive flow of the lesson and make sure that all students have equal opportunities to participate and learn”*. This emphasize that by carefully examining the learning objectives and content of each lesson, the teacher demonstrates a commitment to adapting instructional strategies to meet the diverse needs of both in-person and online students. Teachers who prioritized inclusivity and engagement in their thought processes were found to foster a positive and productive learning environment for all students (Johnson and Smith , 2021) .

Managing transitions between in-person and online interactions in hybrid teaching demands meticulous coordination and flexibility. According to KI B *“ My lesson plan outline facilitates seamless switching between instructional modes. During transitions, cognitive processes such as multitasking and time management come into play as the teacher simultaneously monitors the progress of both in-person and online students, ensuring that everyone remains on track with the lesson”*. In this dynamic teaching environment, quick decision-making is vital as it enables the teacher to adapt their teaching style and materials in real-time, effectively meeting the context-specific needs of students in both settings (Smith & Johnson, 2022). This approach to managing transitions aligns with research emphasizing the significance of cognitive flexibility and adaptability in hybrid teaching, allowing for a cohesive and effective learning experience for all students.

3. The Challenges Faced by Key Informants in the Context of Hybrid Teaching.

The challenges faced by key informants in the context of hybrid teaching is the hybrid teaching environment. The key informant emphasizes the priority of ensuring student engagement and active participation in the hybrid classroom and employs various strategies to achieve this goal. In-person sessions involve open discussions and collaborative activities to promote peer-to-peer interaction, while online students benefit from breakout rooms and virtual group discussions to foster teamwork and a sense of community. The key informant integrates regular quizzes, polls, and interactive assessments to gauge understanding and maintain student engagement. Furthermore, they encourage continuous interaction and knowledge exchange through online forums and discussion boards. These strategies align with research supporting the positive impact of interactive discussions, virtual group activities, and formative assessments on student motivation, sense of belonging, and critical thinking in both in-person and online learning environments (Johnson & Martinez, 2021; Smith & Lee, 2020; Brown & Garcia, 2022; Patel & Williams, 2019). Th KI's approach creates a dynamic learning environment that benefits all students in the hybrid setting.

In addressing potential issues related to student engagement and participation in the hybrid classroom is essential to create an effective learning environment. According to KI B, *“to ensure active involvement from all students, she employed a variety of strategies that cater to both in-person and online learners. During in-person sessions, she encouraged interactive discussions and group activities that promote peer-to-peer learning and collaborative problem-solving. This fosters a sense of community within the physical classroom and encourages students to actively participate in the learning process. For online students, she leverage technology to facilitate virtual group discussions and breakout rooms, enabling them to collaborate and work together effectively. Regular use of formative assessments, such as quizzes and polls, helps her gauge their understanding and identify areas that may need further attention.”* The key informant's response demonstrates a proactive and student-centered approach to ensure active involvement from all students in the hybrid classroom. By employing a variety of strategies tailored to both in-person and online learners, the key informant seeks to create an inclusive and engaging learning environment. The emphasis on interactive discussions and group activities during in-person sessions fosters peer-to-peer learning and collaborative problem-solving, nurturing a sense of community within the physical classroom and encouraging active participation (Johnson & Martinez, 2021). For online students, leveraging technology through virtual group discussions and breakout rooms enables effective collaboration and teamwork, promoting a sense of belonging in the virtual setting (Smith & Lee, 2020). Regular use of formative assessments, including quizzes and polls, allows the key informant to gauge students' understanding and address their individual learning needs, demonstrating a commitment to personalized support and instructional effectiveness (Brown & Garcia, 2022). Through these diverse and research-informed strategies, the key informant aims to create a positive and enriching hybrid learning experience that caters to the unique needs and preferences of all students.

Managing time and workload is undoubtedly a challenge in the hybrid teaching environment, requiring meticulous planning and organization to strike a balance between in-person and online instructional activities. To tackle these challenges, the key informant adopts a systematic approach by structuring lesson plans with clear time allocations for each activity, ensuring comprehensive content coverage while providing ample opportunities for student engagement. This approach aligns with Roberts and Hughes (2020), who emphasize effective time management in optimizing student learning experiences in hybrid settings. Additionally, prioritizing essential learning objectives allows the key informant to avoid overwhelming herself with excessive workload and maintain instructional quality, supported by research from Moore and Baker (2019), showcasing the benefits of goal-oriented time allocation in hybrid classrooms. Seeking support from colleagues and engaging in professional development workshops further enhances the key informant's time management skills and enables her to discover new teaching strategies for optimizing instructional effectiveness in the hybrid classroom, aligning with Harrison and Williamson (2021), who highlight the value of collaboration and continuous professional growth in effective hybrid teaching practices. These research-aligned strategies underscore the key informant's dedication to providing high-quality education and reflect her commitment to continuous improvement as an educator in the dynamic landscape of hybrid teaching.

IV. Conclusion

The study shed light on the cognitive processes, adaptive strategies, and challenges faced by teachers engaged in hybrid teaching. The key informant consistently emphasized the significance of adaptability and flexibility in the hybrid teaching environment. Adapting instructional strategies to cater to diverse learning styles in both in-person and online settings was a recurring theme, showcasing the teacher's commitment to creating a dynamic learning experience for all students. Moreover, the teacher's well-organized approach to decision-making and quick adjustments during transitions highlighted the effectiveness of their instructional practices. The adoption of various strategies to ensure active student engagement, such as interactive discussions, virtual group activities, and formative assessments, reflects the key informant's dedication to maintaining a positive and enriching learning environment. While managing time and workload remains a challenge, the key informant's systematic approach to lesson planning and professional development efforts demonstrate their commitment to optimizing instructional effectiveness. Based on the study's output, educational institutions should consider conducting extension services or professional development workshops that focus on enhancing teachers' cognitive processes and adaptive strategies in hybrid teaching. By providing educators with the necessary tools and support, they can better navigate the complexities of hybrid instruction and create enriching learning experiences for their students. Through continuous improvement and collaboration,

teachers can further optimize their instructional practices and contribute to the ongoing evolution of hybrid teaching in the educational landscape.

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