A PHENOMENOGRAPHIC STUDY ON GRADUATE STUDENTS' CONCEPTIONS OF PAPER-BASED LEARNING THROUGH CASE-BASED AND MODULAR APPROACHES

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This study explored graduate students' conceptions of paper-based learning through case-based and modular approaches in the Graduate School of San Pablo Colleges. Amidst the dominance of digital technologies in higher education, paper-based instruction continues to serve as a meaningful pedagogical practice that fosters focus, reflection, and disciplined study habits. Employing a qualitative design within the phenomenographic tradition, the research examined the written interview responses of sixteen graduate fellows who had engaged with printed case studies and modular materials in their coursework. Data analysis followed Marton and Booth's phenomenographic framework, resulting in categories of description that reflect the varied ways students experience and understand paper-based learning. Findings revealed eight distinct conceptions: paper-based learning as focused engagement, as tangible and personal interaction, as structured and disciplined study, as practical knowledge application, as confidence and participation builder, as flexible but burdened by limitations, as complementary to digital modes, and as foundational for graduate discipline. Together, these categories formed an outcome space that captures the collective variation in student perspectives. The study affirms that while digital resources offer speed and accessibility, paper-based approaches remain valuable for cultivating concentration, critical thinking, and academic grounding. Implications point to the need for blended strategies that integrate the reflective depth of paper-based learning with the efficiency of digital tools. Future research is recommended to extend inquiry across disciplines, explore sustainability innovations, and examine faculty perspectives on traditional learning methods in graduate education.

Keywords: Paper-based learning, Case-based learning, Modular learning, Graduate education, Phenomenography

Introduction

Digital technologies dominate the delivery of instruction, offering speed, interactivity, and accessibility. Yet despite the rapid growth of online platforms and e-resources, paper-based learning remains as a significant and valued pedagogical medium. Within graduate schools, where learners are expected to engage in critical reflection, in-depth analysis, and independent study, traditional approaches such as case-based learning and modular-based learning often continue to rely on printed texts, case documents, and learning modules. These approaches are not only rooted in the history of education but also embody unique cognitive and reflective affordances that digital formats do not always replicate.

Case-based learning, widely employed in professional and graduate education, involves analyzing real-world scenarios that require judgment, critical thinking, and decision-making. When conducted through paper-based formats, case-based learning encourages close reading, annotation, and tangible interaction with texts, allowing learners to engage with complex problems without the distractions common to digital environments. Similarly, modular-based learning through printed self-instructional modules provides structure and pacing for learners to manage their academic tasks. Such modules promote self-directed learning while maintaining a tactile, focused, and often more personal learning experience. These approaches are particularly relevant in graduate education, where students balance advanced academic demands with professional and personal responsibilities.

Despite their enduring presence, the ways in which graduate students conceive of and experience paper-based learning in case-based and modular contexts remain underexplored. Most scholarship on instructional modalities emphasizes digital transformation, often overlooking the perspectives of learners who continue to interact meaningfully with paper-based resources. Graduate students' conceptions of paper-based learning are significant to study because they shape their learning behaviors, study strategies, and perceptions of academic rigor. Furthermore, understanding these varied conceptions can provide educators and curriculum designers with valuable insights into how traditional pedagogical practices may be retained, adapted, or integrated alongside digital innovations.

This study adopts phenomenography as its guiding qualitative tradition. Phenomenography is concerned with exploring the qualitatively different ways individuals understand and experience a particular phenomenon. By focusing on variation in conceptions, this study seeks not to measure effectiveness but

to reveal the range of meanings that graduate students ascribe to paper-based case-based and modular learning. The resulting outcome space will provide a structured way of viewing these differences, shedding light on how students navigate their learning pathways in graduate school.

Method

This qualitative study employed a phenomenographic research design to map the varied ways sixteen purposively selected graduate fellows at San Pablo Colleges (SPC) experienced and conceptualized paper-based case-based and modular learning during the 2025–2026 academic year. Following administrative approval and securing informed consent, data were collected over three weeks using an open-ended written interview guide distributed in both printed and electronic formats, supplemented by follow-up clarifications as needed. The responses were analyzed using Marton and Booth's (1997) phenomenographic method to construct a structured "outcome space" representing the range of student conceptions, while research rigor and ethical integrity were maintained through reflexivity, peer debriefing, verbatim excerpts, anonymization, and strict confidentiality.

Results and Discussion

The results of this phenomenographic study reveal the qualitatively different ways graduate fellows of San Pablo Colleges conceive of and experience paper-based learning through case-based and modular approaches. By carefully examining the written interview responses, the researcher identified recurring patterns, similarities, and contrasts in how participants described their experiences. These patterns were then grouped into categories of description that collectively represent the range of conceptions present in the data.

The analysis demonstrated that graduate fellows articulated their experiences of paper-based learning in diverse yet overlapping ways. Some emphasized its value for focus and concentration, while others highlighted its tactile and tangible qualities that supported memory retention. Several described paper-based case studies as practical tools for real-world application, while modular approaches were often seen as structured pathways that demanded discipline and time management. At the same time, participants acknowledged the challenges of paper-based formats, such as bulkiness, time consumption, and limited searchability, while also noting the potential of combining traditional and digital methods for a more balanced learning

experience. The table below presents the Outcome Space of Graduate Students' Conceptions of Paper-Based Learning, summarizing the key categories of description, their defining features, and illustrative excerpts from participants' accounts.

Table 1.
Outcome Space of Graduate Students' Conceptions of Paper-Based Discussion Learning

Category of Description	Key Features of Conception	Illustrative Evidence from Participants
1. Paper-based learning as Focused Engagement	Seen as distraction-free, enabling concentration, deep reflection, and better retention through handwritten notes and highlighting.	"Paper-based materials help me focus because there are no pop-up messages or distractions"; "I felt more focused because I could mark the pages and flip through them quickly"; "Without digital distractions, I find it easier to concentrate on the content and stay engaged".
2. Paper-based learning as Tangible and Personal Interaction	Valued the tactile experience of holding, flipping, and annotating printed texts; created a sense of ownership over materials.	"It allows me to read, write, and highlight directly on the paper, which helps me focus and remember information better"; "I felt more connected to the content because I could touch and mark the pages"; "It is a more tactile and tangible learning experience, where I can physically annotate, highlight, and flip through pages".
3. Paper-based learning as Structured and Disciplined Study	Modular formats offered clear sequencing and self-paced study, requiring discipline and time management.	"We were given a book with discussions, case studies, tasks, and assessments. I followed the lessons in order, answered activities, and reviewed my answers"; "The printed modules gave me a clear and organized way to learn step-by-step"; "Modular-based learning gave me flexibility but also required self-discipline to finish on time".
4. Paper-based learning as Practical Knowledge Application	Case studies enabled critical thinking, linking theory to practice, and solving real-world problems.	"By working through printed case studies, I can analyze complex situations, apply theoretical knowledge, and develop critical thinking skills"; "I applied theoretical knowledge to practical scenarios… I was able to connect theory to practice"; "Having the case in physical form allows me to highlight key points and see the connection between concepts and their real-world applications".
5. Paper-based learning as Confidence and Participation Builder	Printed notes and highlights boosted confidence, improved preparedness, and supported active class discussion.	"Writing and completing my own notes boosted my confidence, which enabled me to participate in a more insightful and meaningful way"; "Because I highlight and annotate my printed materials, I find it easier to refer to them during class discussions"; "Using printed materials has made me more confident in class

Category of Description	Key Features of Conception	Illustrative Evidence from Participants
		discussions because my notes are readily accessible".
6. Paper-based learning as Flexible but Burdened by Limitations	Recognized flexibility, independence, and accessibility without technology, but also noted bulkiness, lack of search function, and cost of printing.	"Heavy to bring, takes time to find specific details, not easy to update if there are corrections"; "Paper-based learning requires carrying the materials around… updates are harder to make"; "Printed materials can be bulky and be misplaced or damaged".
6. Paper-based learning as Flexible but Burdened by Limitations	Recognized flexibility, independence, and accessibility without technology, but also noted bulkiness, lack of search function, and cost of printing.	"Heavy to bring, takes time to find specific details, not easy to update if there are corrections"; "Paper-based learning requires carrying the materials around… updates are harder to make"; "Printed materials can be bulky and be misplaced or damaged".
7. Paper-based learning as Complementary to Digital Modes	Viewed paper and digital as complementary: paper promotes focus, while digital supports convenience, updates, and collaboration.	"Paper-based helps me focus and remember more, while digital is faster for searching and sharing. I think using both together works best"; "Paper-based formats provide depth and concentration, while digital formats offer speed and flexibility"; "Paper-based learning is better for deep study, while digital learning is better for fast access and collaboration".
8. Paper-based learning as Foundational for Graduate Discipline	Conceived as a formative practice that instills study habits, discipline, and academic grounding in graduate education.	"Paper-based materials served as the foundational building blocks for understanding complex concepts and theories"; "It has grounded my learning, kept me focused, and helped me retain key concepts better"; "Even in my short time, paper-based learning has helped me establish disciplined study habits and deeper engagement with content".

In phenomenography, these categories of description are not treated as isolated themes but as interrelated perspectives that together form what is called the outcome space—a structured representation of the collective variation in conceptions. The outcome space provides a holistic view of the phenomenon by showing the different yet logically connected ways in which learners experience paper-based learning. It highlights both the richness and the limits of participants' understanding, thereby offering insights into how case-based and modular approaches function in graduate education.

Theme 1: Paper-Based Learning as Focused Engagement

Graduate fellows repeatedly emphasized paper-based learning as a means to sustain focus and minimize distractions. Participants described how working with printed modules and case studies reduced interference from social media and notifications, allowing them to concentrate on analysis and reflection. This finding resonates with empirical research showing that reading on paper enhances concentration compared to screens, particularly for deep learning tasks. Clinton (2019) found that students demonstrated better reading comprehension and attention when using print materials rather than digital texts. Similarly, Delgado et al. (2018) concluded in a meta-analysis that screen-based reading often impairs comprehension in longer or more complex texts. For graduate learners, whose academic work demands sustained critical engagement, paper-based materials appear to provide a focused cognitive environment.

Theme 2: Paper-Based Learning as Tangible and Personal Interaction

Graduate students valued the tactile experience of interacting with printed texts, underlining and annotating pages, and physically flipping through notes. These tangible practices were linked with stronger retention and a sense of ownership of learning materials. This aligns with Mueller and Oppenheimer's (2014) widely cited "pen-is-mightier-than-keyboard" study, which demonstrated that handwritten notes foster deeper processing than typed notes. More recent replications (Morehead et al., 2020) confirmed that handwriting supports generative learning by encouraging paraphrasing and summarization. Phenomenographic research by Åkerlind (2005) emphasizes that the qualitative variation in conceptions often stems from the materiality of the learning process. The embodied, physical engagement with paper thus appears central to how graduate students construct meaning from case-based and modular tasks.

Theme 3: Paper-Based Learning as Structured and Disciplined Study

Many participants highlighted how modular-based learning fostered discipline through its sequential and organized structure. They described following modules step by step, answering exercises, and pacing themselves independently, which required self-regulation and time management. This finding mirrors Boelens et al. (2017), who noted that modular learning environments promote learner autonomy by scaffolding self-paced study. Studies in higher education further show that modular formats provide clarity of learning outcomes, which supports students' sense of progress (Aitken &

Sinnema, 2021). For graduate students managing professional and personal responsibilities, structured modules offered both guidance and accountability, reinforcing self-directed learning principles (Knowles et al., 2015).

Theme 4: Paper-Based Learning as Practical Knowledge Application

Participants conceived paper-based case studies as vehicles for bridging theory and practice. They described using printed cases to analyze real-world problems, propose solutions, and apply theoretical insights. This experiential connection made learning more authentic and relevant to professional contexts. Literature on case-based learning underscores this point: Rotgans and Schmidt (2014) demonstrated that case-based approaches foster problem-solving and conceptual understanding, while Dolmans and Gijbels (2017) argued that printed cases remain effective for encouraging collaborative inquiry. For graduate education in particular, the tangibility of printed case studies appears to enhance critical thinking by providing a concrete anchor for reflection and discussion.

Theme 5: Paper-Based Learning as Confidence and Participation Builder

Several participants reported that having printed notes, highlights, and annotations boosted their confidence in class discussions. The accessibility of marked-up materials provided a ready reference, making contributions more precise and prepared. This aligns with Marton and Booth's (1997) idea that learning conceptions influence how students approach participation: having tangible artifacts of learning can scaffold confidence. Research by Sidi et al. (2017) also supports that paper-based formats enhance metacognitive monitoring, helping learners better judge what they know and don't know, thus improving classroom performance. For graduate students, this confidence translates into more active engagement and intellectual exchange, reinforcing the participatory nature of advanced education.

Theme 6: Paper-Based Learning as Flexible but Burdened by Limitations

While paper-based approaches were praised for focus and accessibility, participants consistently noted their limitations: bulkiness, cost of printing, difficulty in updating, and the absence of search functions. These challenges reflect broader debates on sustainability and efficiency in higher education. Baron (2021) highlighted that although students value the tangibility of print, they increasingly seek hybrid solutions to address issues of portability and access. Recent research by Sheppard and Wolffsohn (2018) also points out that reliance on digital formats is partly driven by convenience and environmental

considerations. The recognition of these burdens among SPC graduate fellows underscores the need for balancing traditional practices with modern efficiencies.

Theme 7: Paper-Based Learning as Complementary to Digital Modes

A significant number of participants did not view paper and digital formats as mutually exclusive, but rather as complementary. They argued that paper offered depth and focus, while digital resources provided convenience, updates, and speed. This hybrid view aligns with the growing literature on blended learning. Graham (2013) and Hrastinski (2019) emphasized that effective learning environments combine modalities to maximize strengths and offset limitations. For instance, QR codes or digital links embedded in paper-based modules (as some participants suggested) could expand learning opportunities while preserving the reflective advantages of print. Such perspectives suggest that graduate students are developing adaptive strategies for navigating multimodal learning ecologies.

Theme 8: Paper-Based Learning as Foundational for Graduate Discipline

Several fellows articulated paper-based learning as formative and foundational for their scholarly habits. They described it as "building blocks" for understanding complex theories, instilling discipline, and grounding their academic journey. This echoes phenomenographic research where conceptions of learning often move from surface to deep orientations (Marton & Säljö, 1997). The physicality and structure of paper-based learning seem to foster persistence, a quality crucial for graduate-level scholarship. Recent studies (van der Vleuten et al., 2020) also highlight that traditional practices, when contextualized in higher education, help anchor students' sense of academic rigor amidst digital transformations. For SPC graduate fellows, paper-based learning thus functioned as both a cognitive and affective foundation for advanced study.

Across these categories, graduate fellows demonstrated a spectrum of conceptions, from viewing paper-based learning as a tool for focus and engagement to perceiving it as a cornerstone of graduate-level discipline. The outcome space reflects not only the affordances and constraints of paper-based case-based and modular learning but also the evolving role of traditional methods in a digital era. By situating these findings within existing scholarship, it becomes clear that paper-based learning retains significant pedagogical value in graduate education, not as a relic of the past but as a complementary and grounding practice for deep, reflective, and participatory learning.

Implications

The findings of this study offer significant implications for graduate education, instructional practice, and institutional policy at San Pablo Colleges and similar contexts.

1. The study demonstrates that paper-based case-based and modular learning fosters focused engagement, deeper reflection, and practical application of knowledge. Graduate professors may therefore continue to integrate paper-based materials as part of instructional design, especially in courses requiring critical reading, problem-solving, and extended reflection. However, the recognition of limitations such as bulkiness and lack of interactivity suggests the need for hybrid designs—for example, paper-based modules supplemented with digital references or QR codes linking to multimedia content. This would allow learners to benefit from both the reflective advantages of paper and the convenience of digital platforms.

2. Graduate students identified paper-based learning as foundational in cultivating discipline, confidence, and academic grounding. These findings highlight that traditional approaches still play a role in shaping scholarly habits in the graduate school context. Institutions may therefore encourage the intentional use of paper-based tasks—such as case study packets, annotated readings, and self-paced modules—as tools for developing independent learning skills, time management, and participatory confidence in academic discussions.

3. For SPC and other higher education institutions, the study underscores the value of preserving paper-based learning resources in the era of digital transformation. Policies may be designed to ensure balanced provision of materials—ensuring accessibility for students who prefer or perform better with tangible resources, while still leveraging digital learning management systems. Additionally, cost and sustainability concerns may be addressed by institutional support for affordable printing options, the use of recyclable materials, or blended distribution of paper and digital resources.

Future Directions

Building on the findings and limitations of this study, several directions for future inquiry are recommended:

1. This study focused on graduate fellows in educational management; future research could explore conceptions of paper-based learning in other disciplines such as business, nursing, or STEM fields. Comparative studies may reveal whether the value of paper-based approaches differs across professional contexts.

2. Phenomenographic studies could be extended to track how graduate students' conceptions of paper-based learning evolve throughout their program. A longitudinal design would shed light on whether reliance on paper diminishes, persists, or transforms as learners advance toward thesis or dissertation writing.

3. Future studies could compare phenomenographic outcome spaces for paper-based and digital learning directly, exploring not only differences but also intersections between the two. This would provide a more holistic understanding of how learners navigate multimodal environments in graduate education.

4. With increasing global emphasis on sustainable education, further research could investigate how paper-based learning might be innovated through eco-friendly materials, minimal-print strategies, or hybrid paper-digital ecosystems. The environmental dimension of paper-based instruction remains an underexplored yet pressing area for graduate education research.

5. While this study captured graduate students' voices, future work could include faculty perspectives on the affordances and constraints of paper-based teaching in graduate school. Exploring both sides would provide a more comprehensive picture of instructional dynamics.

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