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Investigating Learning Effectiveness and Student Satisfaction Across Three Course Delivery Modes

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Abstract. As the prevalence of online education grows, we see a burgeoning interest by educators, researchers and policymakers in investigating the impact of delivery modes on various aspects of teaching and learning effectiveness. Our study contributes to this expanding stream of research. We use objective and subjective measures of learning outcomes to compare learning effectiveness and student perceptions across three different delivery modes, traditional (face-to-face), hybrid (a mix of in-person and online asynchronous sessions), and online (asynchronous). For the objective measures, we use scores on Rote, Critical Thinking, and Engagement assessment tools in a required introductory international business course. For the subjective measures, we compare student perceptions by analyzing scores from the Student Evaluation of Instructor (SEIs) surveys administered at the completion of each course. We find differences in the Critical Thinking and Engagement components whereby students in the hybrid delivery group performed better than their traditional and online counterparts. Online students generally had lower scores across the board, especially on the Engagement dimension. In their totality, the objective data results support the value of in-person delivery for learning effectiveness. Regarding student perceptions, results show similar learning experience assessments for the traditional and hybrid modes across most dimensions. We also noted that students were more critical in assessing instructors and learning experiences in online course sections. The contribution of this study is that it champions a more refined approach in conceptualizing instrumental and affective measures of learning effectiveness by leveraging multiple dimensions of both performance and student satisfaction. We completed our research pre-COVID-19, and as such, it was not impacted by the many pedagogical and course delivery challenges faced during the pandemic.

Keywords: online, hybrid, face-to-face, delivery modes.

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1. Introduction

Primarily fueled by the global COVID-19 pandemic, researchers have demonstrated a recent and growing interest in delivery modes, learning effectiveness, and student satisfaction. Despite its challenges, the coincidence of the pandemic with the already-accelerating adoption of alternate learning modes

has given researchers a unique opportunity to study the effectiveness, efficiency, and excellence of different learning modalities. Over time, the educational landscape has pivoted from teacher-centered to student-centered models, auguring a global pedagogical paradigm shift towards learning access across online, hybrid, and face-to-face (traditional) formats. For example, Young and Bruce (2020) examined instructor preferences and satisfaction with various course delivery modes and found that, while instructors prefer face-to-face and online delivery modes, the former tends to generate the highest satisfaction. Some researchers have found learning barriers in virtual modalities based on gender, ethnicity, and residency status, however, Bailey's (2020) work revealed that these variables do not significantly impact student outcomes or preferences across different delivery modes. Using a series of objective measures, Metari (2020) explored student learning outcomes, satisfaction, and retention in hybrid versus traditional courses and found no significant differences between these modalities. Nevertheless, students in face-to-face courses were generally more satisfied and demonstrated higher retention rates than their hybrid counterparts. Although COVID-19 has been the impetus for much of this research interest, our study was conducted pre-pandemic. Whether revolutionary or evolutionary, the profound complexity of this research stream emerges as a critical attribute, warranting deeper study to understand this rich phenomenon better.

To highlight a few notable trends, by April 2020, ninety-eight percent of higher education institutions had transitioned most of their classes to online formats, impacting over twenty million students (Bastrikin 2020). Online degrees, which until recently had only been offered by a handful of universities, are now conferred at most major colleges and universities across the globe. Technavio Market Research Reports (2020) predicted a sustained, annual increase of 11.41% in online education, growing to $247.46 billion by 2024, a figure acknowledged by several researchers (Sánchez *et al.* 2021; Van Doorn & Van Doorn 2014).

The expansion of university offerings to include more virtual options has been primarily driven by changing market demands. To begin with, almost half of online learners select this learning mode for its convenience. For example, for students with challenging work schedules that limit the opportunities for regular face-to-face meetings, online programs may be the only viable option for degree completion. Moreover, today's students tend to look for greater flexibility in pacing their coursework. Affordability, university reputation, employer incentives, and commuting also contribute to this trend (Bastrikin 2020).

We build on prior literature for this study and explore fundamental research questions. Specifically, we use objective measures to study learning effectiveness and subjective measures to investigate student satisfaction across three different course delivery modes: face-to-face, hybrid, and online.

2. Literature Review and Hypotheses

Our literature discussion is organized into two broad categories: variables linked to performance differences and those associated with course and instructor satisfaction. Researchers have grappled with effectively measuring learning outcomes and student satisfaction. Evaluation methodologies have been challenged by several limitations. For example, (1) correlation and causation are used interchangeably; (2) statistical and practical significances not distinguished; (3) multidimensional variables such as student evaluations not being treated as such; (4) units of analysis remain unclear; (5) issues with validity and reliability; and (6) qualitative vs. quantitative methodologies producing very different results (Benton & Cashin 2012; Dolnicar & Grün 2009; Jaggars & Bailey 2010; Kupczynski *et al.* 2012; Severino & Messina 2011; Wilson & Allen 2011).

Moreover, as student evaluations are employed across different modalities, validity challenges increase. In 1994, Anthony Giddens coined the term "disembedding" (Severino & Messina 2011, p. 66), representing the restructuring that occurs in shifting from a tangible, shared physical space and time to online, virtual platforms characterized by dimensions of indefinite time and space. However, this disembedding represents only the first layer of contextual differences and complexities accompanying learning mode transitions. Several researchers argue that more robust evaluation methodologies are necessary, given the varying experiences in asynchronous, virtual settings (Brocato *et al.* 2015; Clayson 2009; Kim & Bateman 2010; Porter 2011).

Our goal is in part to transcend the limitations of previous works, such as Brocato *et al.* (2015), who employed only student-centered, standardized instructor evaluations as their dependent variable. By including both quantitative, objective measures to assess learning outcomes and qualitative, subjective measures to capture student satisfaction, we hope to add to the robustness and generalizability of this research stream. First, we address performance differences across modalities and then satisfaction differences across the same three modalities.

2.1. Student Performance Across Course Modalities

The cornerstone of face-to-face learning platforms is the unique in-person/social context learning opportunities fostered through role-playing, student presentations, debates, and other innovative, immersive activities. These advantages are integral to traditional learning environments and less prevalent in either hybrid or online settings (Allen & Seaman 2013; Van Doorn & Van Doorn

2014). The face-to-face environments capitalize on communication, interpretation, and presentation skills, creating fun and exciting exercise opportunities, with students benefiting from immediate feedback. Challenges remain to replicate this same experience in asynchronous, online settings (Allen & Seaman 2013; Van Doorn & Van Doorn 2014).

Still, another relevant literature stream underscores the importance of interpersonal nuances, non-verbal communication, and physical proximity, unique to face-to-face learning environments. Facial expressions are pivotal to the in-class learning experience for networking, relationship-building, and cultivating social and emotional intelligence (Bramorski & Madan 2016; Chahkandi 2021; Goleman 1995; Kristjnsson 2006; Van Doorn & Van Doorn 2014).

Turning to the concept of knowledge transfer and the positive relationship between physical proximity and absorptive capacity, Belin (2016) notes that knowledge may be thought of as power, and knowledge transfer is empowerment. The traditional classroom leverages physical proximity and direct interaction, making the knowledge transfer process far more efficient in a face-to-face environment than in either hybrid or online modalities. Importantly, successful knowledge transfer is a function of absorptive capacity (Bakker *et al.* 2011). Further, team tasks and job engagement have significant positive effects on knowledge transfer and mediating effects on the process of tacit knowledge transfer (Cao *et al.* 2012). In another study, Ensign *et al.* (2014) researched the relationship between knowledge transfer and innovation along three dimensions of proximity: geographic, cognitive, and organizational, revealing that the elements of proximity substantially influence both knowledge transfer and innovation. Along these same lines, Torre (2008) contends that geographical proximity remains essential for knowledge transfer. Traditional modalities foster more significant opportunities for robust knowledge transfer by capitalizing on Socratic exchanges, high-quality discussions, and creative team presentations. As such, knowledge transfer will be more pronounced in hybrid course formats than in online modes (Van Doorn & Van Doorn 2014). Our paper builds upon these findings regarding the value of geographical proximity in advancing our hypotheses.

There is also a notable generation gap in preferences between graduate and undergraduate students. The literature reveals that younger, traditional students prefer more entertaining and humorous professors in face-to-face formats, whereas non-traditional, graduate students value courses taught by organized, accommodating, and knowledgeable professors in flexible, online modalities (Van Doorn & Van Doorn 2014).

Several studies have explored the propensity for students to multitask in virtual settings, which relates to remote learning environments being less conducive to building interpersonal connections, whereas face-to-face environments more readily foster rich exchanges (Bramorski & Madan 2016;