Design–Based Research for Virtual Learning:
A Holistic Perspective on the Pedagogical and Contextual Factors of Interactive Mobile Technology

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EXECUTIVE SUMMARY

This design-based research dissertation study provides a holistic perspective on the pedagogical and contextual factors of interactive mobile technology on English learners. Specifically, the study explored current virtual technologies designed to model face-to-face EL instruction due to the COVID-19 pandemic-prolonged school closures. After evaluating three cycles of interventions founded on Stephen Krashen's and Lev Vygotsky's language learning theories and utilizing a teacher survey and researcher observations, the study identified an onslaught of key takeaways including the need for investment of necessary infrastructure, ed-tech policies and standards, and comprehensive pedagogical frameworks to effectively operationalize virtual learning and leverage best practices of interactive mobile technology. The study discusses the impact of the sudden shift in educational contexts and provides suggestions for overcoming challenges in educational technology integration within the computer-assisted language learning contexts.

INTRODUCTION

Current research in English language development (Barrow & Markman-Pithers, 2016; Castrillon, 2017; Park, 2011, Sharma & Chowdhry, 2018; Stiles & Louie, 2017; Thomas, 2017; Zhang, 2014) has demonstrated interactive mobile technology increases language proficiency skills through personalized instruction, promotes a low-affective filter communication environment, and targets second language acquisition (SLA) skills through the socialization of learning (Krashen, 2008). While there is a lot of

literature that focuses on second language acquisition methodologies on academic achievement in general, there was a need to identify examples and best practices of educational technology interventions designed specifically to improve second language skills. The already challenging situation of language acquisition was burdened with additional hurdles due to school closures and the transition of face-to-face instruction to virtual learning amidst the COVID-19 pandemic. The novel coronavirus has become an accelerating agent, forcing educational institutions to discover alternative solutions in extremely short periods (Comeau & Hattersley, 2020; Fishbane & Tomer, 2020; Kemp, 2020; Robles, 2020). These exacerbating conditions stemmed from socio-cultural and economic factors, such as the lack of equality in the accessibility of the internet and devices, especially among Hispanic English learners (Comeau & Hattersley, 2020).

Current K-12 and higher education organizations modified their primary instructional methods and transitioned to online learning almost overnight. According to the United Nations Educational Scientific and Cultural Organization (UNESCO) Institute for Statistics (2020), over 1.5 million pre-K-12th grade learners were affected by school closures caused by the coronavirus pandemic. With over 190 country-wide closures, over 90% of enrolled learners were impacted. The National Center for Education Statistics (2020) stated only 46% of the nation's schools had a written plan for a pandemic, and many of them did not have the infrastructure or resources to build an equitable and efficient online course platform for all their students (Kemp, 2020; UNESCO, 2020).

PURPOSE AND SIGNIFICANCE OF THE STUDY

As a culmination of a dissertation, the goals of this study were to determine how screencast interaction platforms and video conferencing (synchronous and asynchronous) work as interactive mobile technology. Specifically, the goals of this study were to:

- Determine the challenges, limitations, and advantages of different types of interaction platforms (synchronous and asynchronous).
- Improve the theoretical potential of these interactive mobile technology interventions.
- Increase the language competencies of students (listening, reading, writing, and speaking).
- Confirm the Krashen comprehensible input, output, sheltered instruction, and Vygotsky sociocultural second language learning theories in virtual contexts.

This design-based research study evaluated the effectiveness of interventions from synchronous and asynchronous screencasts and video conferences as a current software technology for English language acquisition. In doing so, the researcher evaluated the entire ecology of the online education system to make improvements to software applications and design practices (O'Rourke & Stickler, 2017; Snyder, 2008). The study explored how design is crucial and influences interactive mobile technologies and their software applications as a means for supporting academic success in schools with high populations of Hispanic English learners and address current gaps in the field of educational technology.

The study is significant because it uncovers the overall theoretical potential of these platforms in connection to the Vygotsky and Krashen language learning theories by exploring synchronous and asynchronous interactions. In addition, the study exposed the realities of practical implementation, including

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