

Investigating College Students' and Instructors' Perspectives on Adopting Technologies for Public Speaking Skills Development in a Hispanic Serving University

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ABSTRACT

Technology has been shown to reduce students' public speaking anxiety, enhance their delivery skills, and increase presentation self-efficacy. However, students can only garner benefits if technology designed for improving public speaking skills has been adopted and implemented. This study aims to analyze the relationship between students' communication competence, perceived technology features, technology satisfaction, and intention to use technology designed for improving public speaking. In addition, we examined instructors' insights into incorporating such technologies for public speaking into classrooms. Based on the technology acceptance model (TAM), the study focuses on decision-making surrounding the adoption of two technologies for public speaking (a video-based technology that facilitates real-time feedback from humans, and an AI-based technology for automatic feedback) in a Hispanic-Serving Institution. A quantitative survey with students ($n = 80$) and a qualitative survey with instructors ($n = 11$) were conducted. Findings of a path analysis indicate that students with lower levels of competence in communication tended to find public speaking technologies more useful. Moreover, students' perceived technology usefulness and ease of use were positively associated with intentions of future technology use through technology satisfaction. Additionally, a qualitative analysis of instructors' responses revealed that technologies could be helpful for teaching public speaking if they assist rather than replace instructors in offering feedback.

Keywords: *Technology Acceptance Model; educational technology; underrepresented students; Hispanic Serving Institution; public speaking*

INTRODUCTION

Public speaking skills are vital for student success in classrooms, obtaining and sustaining successful careers, and citizen participation (Baird & Parayitam, 2019; Coffelt, Grauman & Smith, 2019). Effective public speaking skills can aid in self and group advocacy in crucial professional situations such as job interviews (Ab Rahman, Mohamed, Nasir, & Saidin, 2019). These skills can also help students stand up for values and even shape values that support important causes such as diversity and inclusion in both their classrooms and in the community. Albeit important, instructors are often challenged not only to spend time with students one-on-one in practice sessions, but also in assigning presentations to be completed in traditional classrooms and online courses (Baker & Baker, 2022; Prentiss, 2021). Additionally, students may face challenges in developing their presentation self-awareness due to speech anxiety and delayed feedback (Prentiss, 2021).

One strategy to address these challenges is using technology designed to enhance public speaking. Previous studies have found that the application of virtual reality, video streaming, 360-degree videos, video annotation software, and artificial intelligence can improve college students' public speaking competency, enhance their self-efficacy, and reduce public speaking anxiety (Baker & Baker, 2022; Hager, Fiechtl & Gunn, 2020, Kedrowicz & Taylor, 2016). These technologies have also been incorporated into commercially available applications, such as video-based technology that facilitates real-time feedback from humans, and AI-based technology for

automatic feedback, that universities can purchase to provide scalable treatment for enhancing students' public speaking skills. However, to ascertain the level of technology utilization, understanding the acceptance around newer technologies for both faculty (who would implement them) and students (who would use them) is necessary. More specifically, in a pandemic era in which faculty and students were thrust into technology use, this study explores the motivations to adopt auxiliary technology for pedagogical purposes. In other words, although technology was required to implement online teaching during the COVID-19 pandemic, instructors could decide the extent to which to incorporate specific technology applications in their courses. Second, whereas students are required to use specific technology to complete a certain course task, they can choose whether to continue utilizing that technology after the class is over for additional benefits.

The present study is based on the technology acceptance model (TAM; Davis, 1989) as the theoretical framework because this model explains the process through which people adopt technology. According to the TAM, people's decision to adopt a certain technology is driven by their perceptions of the usefulness and the ease of use of technology applications. Further extensions of this model consider the antecedents to people's perceptions of technology features (Abdullah & Ward, 2016; Yalcin & Kutlu, 2019; Lee & Lehto, 2013) and the mediators linking perceived technology features and people's technology adoption decisions (Giese & Cote, 2000; Islam & Sheikh, 2020; Joo, Lee & Ham, 2014). This study specifically focuses on communication competence as the antecedent to people's perceptions of technologies designed for improving public speaking, given communication competence not only predicts people's public speaking performance but also their attitude toward communication technologies (Morreale, Staley, Stavrositu & Krakowiak, 2015). The study also seeks to examine technology satisfaction as the mediator linking perceived technology features and adoption intention because satisfaction is a key predictor of consumers repurchase of a product or a service. This shares similarities with people's decision to adopt a certain technology after their initial usage.

Although the TAM has been applied to predict students' adoption of various teaching innovation technologies, this line of research has three limitations. First, few studies have applied this model to understand the decision-making surrounding people's intention to use technologies designed for public speaking skills. Second, research on both students' and instructors' perceptions of technology features and their decisions is scarce. Third, whereas research on the application of TAM in the higher education context tends to focus on general students, the knowledge of what predicts pedagogy technology adoption among underrepresented students is limited. Addressing these limitations is practically important because it can help researchers and educational decision makers to take advantage of technology to 1) improve students' public speaking skills and instructors' effectiveness in teaching these skills which are challenging to fulfill in traditional classrooms; and 2) close the digital divide between underrepresented students and their peers. Theoretically, this inquiry broadens the TAM by applying it to a novel technology context and a different population.

The purpose of this study is to examine the adoption decision of technologies for public speaking skills development from the perspectives of both instructors and students in a Hispanic-serving institution in the United States. Specifically, this study investigates the relationship between communication competence, perceptions of technologies designed to improve public speaking, technology satisfaction, and technology use intentions. The two technologies investigated here are a video-based technology that facilitates real-time feedback from humans, and an AI-based technology for automatic feedback. These technologies aim to develop students' self-awareness of their public speaking performance through video recording and providing feedback. This study proposes that students' perceptions of technology usefulness and ease of use are positively associated with each other, which further predicts intentions of future technology through technology satisfaction. Moreover, it is expected that students' communication competence positively predicts their perceptions of the usefulness of the technology. Additionally, this study

aims to explore the technology features that instructors consider useful in enhancing students' public speaking skills and the support they desire to facilitate the ease of using technologies.

LITERATURE REVIEW

Technology, Pedagogy, and Public Speaking

Technology can enhance teaching and learning due to its flexibility, customization, and ability to integrate various resources (Hu, Wang & Jiang, 2021). According to a systematic review conducted by Kirkwood and Price (2014), technology can facilitate classroom functionality, promote a quantitative change in learning outcomes, and transform students' learning experiences. For example, in a study conducted by Copley (2007), students reported that podcast lectures made resources more accessible and provided greater flexibility than face-to-face lectures, so that students can learn at their own pace. Moreover, a 3-year longitudinal quasi-experiment conducted by Connolly, MacArthur, Stansfield and McLellan (2007) found that compared to face-to-face lectures, online asynchronous lectures increased students' assessment scores, enabled students to engage in higher order thinking processes, and encouraged greater critical awareness. The authors argued that this difference might be because online asynchronous lectures required students to engage in more written communication, which encouraged more reflection than among face-to-face students.

The potential afforded by technology offers opportunities to enhance pedagogical practices that are constrained in traditional classrooms, such as teaching public speaking. Constrained by class size and time, traditional classrooms only offer limited opportunities for students to practice public speaking (Chen, 2022). Additionally, the assessment of public speaking skills typically involves a "one-shot" presentation in front of live audiences, which creates a high-stakes environment that exacerbates students' anxiety (Walton, 2018). Anxiety resulting from such presentations may further restrict students' cognitive resources to build awareness of their behaviors during a speech and hinder subsequent self-reflections of presentation performance. Moreover, feedback is given long after a speech, depriving students of the feedback context to identify the specific behaviors for improvement. These challenges, however, can be tackled with the development of technologies designed to enhance public speaking.

Recent technologies, such as virtual reality and 360-degree videos, create scenarios that allow students to practice in front of simulated audiences providing unlimited rehearsal opportunities. This way, students can learn to control their panic in these anxiety-inducing situations (Frisby, Kaufmann, Vallade, Frey, & Martin, 2020; Reeves, Elliott, Curran, Dyer, & Hanna, 2021). For example, using a pre-post experimental design, Chen (2022) found that a VR-based mobile application in a foreign language learning course significantly reduced students' self-reported public speaking anxiety. Additionally, artificial intelligence (AI) and video-annotation software also enable real-time, synchronized feedback that students can review in their presentation recordings to reflect on their strengths and areas for improvement (Dupagne, Stacks & Giroux, 2007; Schneider, Börner, Van Rosmalen & Specht, 2015). For example, Flink and Cooper-Larsen (2020) reported that the use of an AI-based technology for automatic feedback, that is, an AI-based application which can offer real-time presentation feedback, improved sales education students' vocal delivery skills and self-efficacy for sales presentations over time. As another example, Lewis and Jones (2019) reported a virtual coaching session which was conducted using a video-based technology assessment tool, enhanced the self-efficacy for principal preparation program students.

To benefit from technologies for enhancing public speaking, instructors need to first make decisions about technology adoption in classrooms. Furthermore, even if instructors adopt a particular technology, its effectiveness will be reduced if students have negative experiences with it and

subsequently decline to use it. The following section reviews the theoretical framework that illuminates the process through which people decide to adopt a particular technology.

Technology Acceptance Model and its Extension

One commonly used model to understand decision-making surrounding technology adoption is the technology acceptance model (Davis, 1989). According to the TAM, people's intention to adopt technology is driven by the perceived usefulness of the technology and its perceived ease of use. Specifically, perceived ease of use refers to the extent to which people consider that using a particular technology would be worth the effort, and perceived usefulness describes the extent to which people believe that using such technology would enhance their performance regarding a certain task. In addition to their direct influence on the technology adoption intention, the TAM also proposed that the perceived ease of use of a certain technological innovation positively predicted the perceived usefulness of such technology (Davis, 1989). Consistent with the TAM, a meta-analysis of more than 60 studies on technology adoption showed that perceived ease of use had a small effect size on adoption intention, whereas perceived usefulness had a medium effect size on intention of technology adoption (King & He, 2006). Additionally, empirical studies have shown that both perceived ease of use and perceived usefulness positively predicted the intention to adopt information and communication technology by educators (Teeroovengadum, Heeraman & Jugurnath, 2017), such as immersive 360° videos (Vallade, Kaufmann, Frisby & Martin, 2020), e-learning systems (Lee, 2006), and remote learning (Mailizar, Burg & Maulina, 2021).

Based on the original TAM, researchers have extended this framework in several ways. One extension of the TAM focuses on the explanatory mechanisms of the relationship between perceived technology features and adoption intention. In this line of research, one critical mechanism is technology satisfaction, which captures the level of positive affective judgment when people find the use of technology is consistent with their existing needs and experiences (Giese & Cote, 2000; Islam & Sheikh, 2020; Joo, Lee & Ham, 2014). According to this extension, both perceived technology usefulness and perceived ease of use can increase users' satisfaction with the technology, which further drives their decision to adopt the technology. Specifically, before using a particular technology to complete a task, people have an initial expectation of fulfilling certain requirements. Through working on the task, people gain experience about the technology and develop perceptions about its performance. The more positive the perception of that technology's performance, the more likely the individuals will believe the technology can help them fulfill the expected requirements, which then leads to greater satisfaction (Adeyemi & Issa, 2020; Thong, Hong & Tam, 2006). Meanwhile, when people perceive the use of a particular technology as low effort or they are fluent in it, they will have a more positive effect toward this technology. Given that positive affect can be manifested as satisfaction (LaTour & Peat, 1980), perceived ease of use is expected to be positively associated with satisfaction. Furthermore, in the marketing literature, satisfaction has been found to be a major reason that people re-purchase a product (Szymanski & Henard, 2001). Given the similarity between repurchasing products and adopting a particular technology after the initial usage, satisfaction is expected to be positively associated with technology adoption for future use. Consistent with this rationale, Al-hawari & Mouakket (2010) reported that participants' perceived usefulness of e-learning and its ease of use positively predicted their satisfaction with e-learning, which further predicted their likelihood of continuing to engage in e-learning.

Another extension of the TAM focuses on the antecedents to people's perceptions of technology features. Previous studies have identified psychological (e.g., self-efficacy), social (e.g., subjective norms), and contextual factors (e.g., technology functionality) as predictors of perceived technology usefulness and its ease of use (Abbasi, Altmann & Hossain, 2011; Dishaw & Strong, 1999; Lee & Lehto, 2013).

In the context of adopting technology designed to enhance public speaking skills, this study focused on communication competence as an antecedent to how people perceive the features of public speaking technologies. Communication competence refers to “adequate ability to pass along or give information; the ability to make known by talking or writing” (McCroskey & McCroskey, 1988, p. 3). The relationship between communication competence and perceived usefulness of technologies to enhance public speaking skills is inconclusive. On one hand, people who are more competent in communication may be more knowledgeable and skilled at using technologies to achieve a desired goal (Morreale, Staley, Stavrositu, & Krakowiak, 2015). Subsequently, they are more likely to recognize the usefulness of these technologies to polish their (already proficient) public speaking skills. On the other hand, people who are less competent may consider that public speaking skill technologies provide a low(er)-stakes environment to practice, which is typically lacking in traditional classrooms.

Limitations in Previous Literature on TAM

Although the TAM has received robust empirical support in adopting pedagogy technologies, the existing literature is limited in three ways. First, whereas much of the research has focused on technologies such as Moodle, designed for course management (Al-hawari & Mouakket, 2010; Modise & Molotsi, 2022; Mtani & Mbelwa, 2022) or remote learning, limited research has investigated what drives people’s adoption of technology designed for improving a particular skillset, such as public speaking skills (Vallade, Kaufmann, Frisby & Martin, 2020, provides an exception). The research on this topic is critical for leveraging the advantages of technology to improve students’ public speaking skills and instructors’ effectiveness in this skill. The specific pedagogy technologies examined in our study were a video-based technology that facilitates real-time feedback from humans, and an AI-based technology for automatic feedback. The two technologies build their core features of giving and receiving feedback, which bridges teaching and learning from both instructors’ and students’ perspectives. Moreover, both technologies have been shown to be effective at improving students’ self-efficacy of public speaking. Detailed descriptions of the technologies are presented in the methods section.

Second, whereas most research on TAM and pedagogy technologies focused on either the students’ or instructors’ perspectives (Mtani & Mbelwa, 2022), the literature that explores how both students and instructors perceive and experience the same technology is scarce. This knowledge is important because the successful implementation of a particular technology needs the buy-in from both the instructors (the “gatekeepers” who decide which technology to be adopted) and the students (the actual users).

Third, only a few studies on TAM have examined the facilitators and barriers that influence the decision-making surrounding adopting pedagogy technologies among underrepresented students. Underrepresented students are those who are disadvantaged economically, minorized, and/or first-generation (Hurd, Tan & Loeb, 2016). This population has been historically and systematically oppressed and disenfranchised within the field of higher education due to their race, ethnicity, gender, class, sexuality, and/or ability (Okstad & Hutchings, 2022). For instance, compared with their privileged peers, underrepresented students have been persistently experiencing a digital divide, defined as “unequal access to computers and the Internet that breaks along familiar socioeconomic fault lines, such as income, education, race and age” (Wilhelm & Thierer, 2000; p. 40). This digital divide has caused disparities in how underrepresented students perceive and use technology. For example, in a survey of 226 Hispanic college freshmen, Slate, Manuel and Brinson (2002) found statistically significant differences between students whose primary language spoken at home was English and students whose primary language spoken at home was Spanish, in their attitudes toward and use of the Internet and computer technology. Consequently, the digital divide can hinder underrepresented students from benefiting from technology in an equal way as their privileged peers (Bell, Aubele & Perruso, 2022). Bell *et al.*, (2022) found that many students

enrolled in institutions with high rates of low-income and first-generation students do not have access to adequate technology. Limited access to Internet quality and effective technology tools is one of the challenges that students enrolled in HSIs can face, which can impact their success rate related to using online tools for educational purposes.

To narrow the digital divide so that underrepresented students can use pedagogical technologies to acquire knowledge and skills for social mobility, understanding what predicts the technology adoption decision of this population is critical. Therefore, this study examines adopting technologies designed for improving public speaking among students in a Hispanic-serving institution. Hispanic-Serving Institutions are public and private two and four year colleges and universities with Latino enrollments of 25% or more full-time equivalent students (Laden, 2004). We choose to focus on the Hispanic student population because Hispanic constitutes the largest minority group in the United States (US Census Bureau, 2020).

RESEARCH QUESTIONS AND HYPOTHESES

To address the literature gaps, this study seeks to understand what influences the intention of future use of two public speaking technologies (video-based that facilitates real-time feedback from humans, and an AI-based technology for automatic feedback) from both students’ and instructors’ perspectives in a Hispanic-serving institution. Specifically, based on the TAM and its extensions, this study examines the process through which communication competence is associated with the intent to use technologies for enhancing public speaking skills through perceived technology features (i.e., perceived ease of use, perceived usefulness) and satisfaction with technology from a students’ perspective. The hypothesized path model is presented in Figure 1.

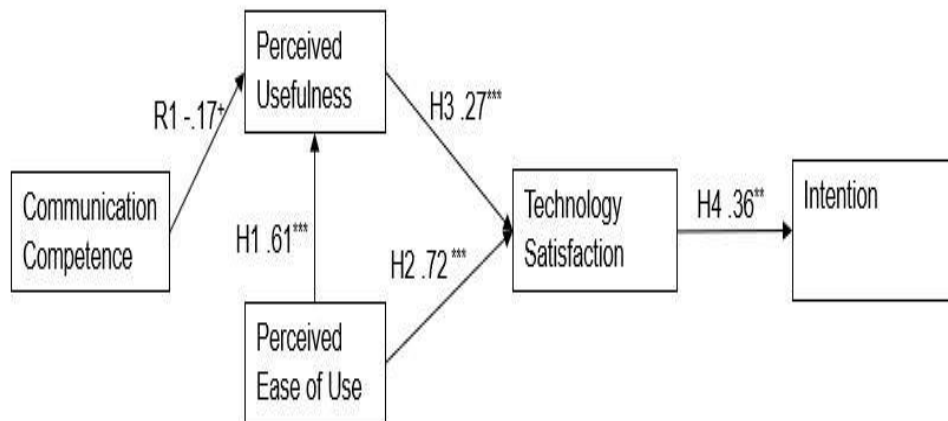


Figure 1: Diagrammatic representation of the hypothesized mediation model with path coefficients.

Note: *n*=63 (listwise deletion) +*p*<.10; ***p*<.01, ****p*<.001

Specifically, given that little research has examined the association between students’ communication competence and their perception of technology features, this study explored the following research question:

RQ1: *What is the nature of the association between students' communication competence and their perceived technology usefulness?*

Furthermore, following the predictions of TAM, its extensions, and the robust association between perceived ease of use, perceived usefulness, and technology satisfaction, to the intention to use the technology, this study propose the following hypotheses:

H1: *Students' perceived ease of use will be positively associated with their perceptions of technology usefulness.*

H2: *Students' perceived ease of use is positively associated with their technology satisfaction.*

H3: *Students' perceived technology usefulness is positively associated with their technology satisfaction.*

H4: *Students' technology satisfaction is positively associated with their intention to use the technologies.*

Additionally, to gain insights into technology features that instructors consider useful and the help they need to implement the technology smoothly, this study explores the following research questions:

RQ2: *What features of public speaking technologies do instructors find helpful in teaching public speaking skills?*

RQ3: *What support do instructors wish to receive to implement technologies for public speaking?*

METHODS

This study applied a mixed-method design to examine public speaking technology adoption. Surveys tailored to either instructors or students were administered through Qualtrics in 2019. The surveys included both open-ended and Likert-scale type questions. In all, 80 students and 11 instructors completed the surveys.

Participants and Sampling

The study was conducted in a Hispanic-serving institution (HSI) on the west coast of the United States. The HSI university enrolls 66% Hispanics, 5% African American, 5% Asian, 12% Caucasian students, 5% non-resident international students, and 6% students from other groups (mixed races). Additionally, regarding the socioeconomic background, approximately 80% of the students at this university are first generation university attendees, and 58% of undergraduates are low-income (receiving Pell grants).

The instructor participants were recruited via email from those who voluntarily attended a workshop on technologies designed for improving public speaking skills in Fall 2018. The technologies introduced in this workshop included video-based technology that facilitates real-time feedback from humans, and an AI-based technology for automatic feedback. All instructor attendees were encouraged to implement one of the public speaking technologies in at least one course and disseminate our survey to their students during that term. Only those who met both criteria (implementing the technology and asking students for feedback) were considered eligible instructor participants and were offered a nominal stipend upon completion.

In all, eleven instructors participated in the survey that evaluated their perceptions about using technologies for teaching public speaking. Most participants reported being female (63.6%), 25–29

years old (54.5%), and non-tenure track instructors (81.8%). The instructor sample consisted of more Caucasians (45.4%) than the student sample.

Because instructor participants were asked to share the survey with students in appropriate courses to be considered eligible for the study, student participants were recruited via purposeful snowball sampling. Students may have received extra credit for their participation, which was based on instructor's discretion per IRB protocol. A sample of 80 students responded to the survey assessing their public speaking technology use. Among the participants, 18 of them indicated the use of the AI-based technology in their classes and 65 indicated the use of the video-based technology. Most of the student sample were females (65.0%) and domestic students in the U.S. (92.5%). Most of them reported being 18–24 years old (82.5%) and Hispanic (67.5%). The demographic information of the samples is provided in Table 1 below.

Table 1: Descriptive Information on Demographic Characteristics

Age	Student Sample		Instructor Sample	
	n	%	n	%
18-24	66	83.5	0	0
25-29	10	12.7	6	54.5
30-34	2	2.5	1	9.1
35-39	0	0.0	1	9.1
40-44	0	0.0	0	0.0
45-49	0	0.0	0	0.0
50-54	1	1.3	1	9.1
55-59	0	0.0	0	0.0
60 or more	0	0.0	2	18.2
Sex				
Male	26	33.3	2	18.2
Female	52	66.7	7	63.6
Other	0	0.0	2	18.2
Ethnicity				
African American	1	1.3	1	9.1
Asian/Asian American	4	5.0	1	9.1
Caucasian	13	16.5	5	45.4
Hispanic	54	68.3	4	36.4
Native American	1	1.3	0	0.0
Other	6	7.6	0	0.0
Domestic Student				
No	4	5.1	-	-
Yes	74	94.9	-	-
Tenured/Tenure-Track				
No	-	-	9	81.8
Yes	-	-	2	18.2

Procedures

In both the instructor and student surveys, participants provided consent before answering questions. Both surveys first asked participants to identify the technology designed for enhancing public speaking skills (that is, a video-based technology that facilitates real-time feedback from humans, or an AI-based technology for automatic feedback) used in their courses. Participants were then asked questions about perceptions regarding the technology they selected. Specifically, the survey to instructors included open-ended questions on their thoughts of using technologies for enhancing students' public speaking skills and the desired support for implementing technologies for public speaking in their classes. The survey version for students assessed the perceived technology usefulness, perceived ease of use, perceived communication competence, perceived technology satisfaction, and the intention of using technology. Demographic information was collected at the end of both surveys. If participants did not indicate that any technology for public speaking was used in their classes, they were required to only answer those questions related to intentions and demographic characteristics. The average time to complete the survey was about 10-15 minutes for both instructors and students. The above procedures were approved by the Institutional Review Board of the university in which the authors are affiliated.

Technology Context

As mentioned previously, this study focused on students' and instructors' perceptions and adoption decisions of two technologies designed for improving public speaking skills:

- A video-based technology that facilitates real-time feedback from humans is an application that can be integrated with a learning management system (e.g., Canvas) that focuses on video assignments, such as public speaking presentations. This application allows 1) students to record their performance using any smartphone or laptop and then upload the video to the cloud, and 2) instructors to record students' live presentations. When viewing the video, instructors or students can leave time-coded comments that are synchronized to the precise moment of the presentation in the video.
- An AI-based technology for automatic feedback is a cloud-based presentation recording application that evaluates ten delivery elements (e.g., pitch variability, pace, pauses) during a live presentation. The evaluation is generated by comparing a presentation to a database of presentation videos that AI judges as effective. Based on the evaluation, this application then provides personalized feedback for improvement. Another feature of the AI-based technology for automatic feedback is that it simulates audiences that give real-time non-verbal responses (e.g., head nodding, yawning) to the presenter during the live presentation based on the vocal delivery skills.

Measures

Instructor Survey

Usefulness of technology. To assess how instructors evaluated the usefulness of technologies for public speaking, the survey included an open-ended question: "What are your overall thoughts about using the specific technology to improve students' public speaking skills in the course(s) you have taught?"

Technology support. To identify the support that could improve the ease of use of technologies for public speaking, an open-ended question asked: "What kind of pedagogy support do you think you would need to incorporate technology into the classroom?"

Student Survey

Unless otherwise stated, all variables were measured on 5-point scales and scored so that higher scores indicate more of that variable. See Table 2 below for items used in this study.

Table 2: Data Collection Instrument

CONSTRUCT	ITEMS
Perceived communication competence	Present a talk to a group of strangers
	Talk with an acquaintance
	Talk in a large meeting of friends
	Talk in a small group of strangers
	Talk with a friend
	Talk in a large meeting of acquaintances
	Talk with a stranger
	Present a talk to a group of friends
	Talk in a small group of acquaintances
	Talk in a large meeting of strangers
	Talk in a small group of friends
Perceived technology usefulness	Using the video-based technology this quarter has improved my performance in public speaking
	Using the video-based technology this quarter has improved my effectiveness in public speaking
	Using the video-based technology has been useful for me to enhance my public speaking performance.
Perceived ease of use	Learning to use the video-based technology is easy for me
	I find the video-based technology easy to use
	It is easy for me to become skillful at using the video-based technology
	Using the video-based technology is clear and understandable.
Perceived technology satisfaction	I am satisfied with the function of the video-based technology
	I am satisfied with my interactions with the video-based technology
	I am satisfied with the content of the video-based technology
Intention of future use of public speaking technology	I intend to continue using the video-based technology in the future for other public speaking projects
	I will continue to use the video-based technology frequently
	I will try to use the video-based technology in other public speaking projects.

Perceived communication competence. This variable was measured by asking participants to indicate their ability to communicate in eight situations (McCroskey & McCroskey, 1988), such as “present a talk to a group of strangers”, and “talk in a large meeting of friends.” Participants’ responses were recorded with a slider using a 100-point scale with 0 being completely incompetent and 100 being competent ($M = 74.39$, $SD = 17$, $\alpha = .89$). For means and standard deviations see Table 3 below.

Table 3: Student Sample ($n=80$) Means and Standard Deviations

Perceived communication competence		Perceived technology usefulness		Perceived ease of use		Perceived technology satisfaction		Intention of future use of public speaking technology	
Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
74.39	17	3.89	.85	4.31	.84	4.37	.87	3.61	.95

Perceived technology usefulness. This variable was measured with three Likert-scale items adapted from Davis (1993) ($M = 3.89$, $SD = 0.85$, $\alpha = .93$). Sample items included “Using a video-based technology that facilitates real-time feedback from humans improves my performance in public speaking” and “Using a video-based technology that facilitates real-time feedback from humans increases my effectiveness in public speaking”.

Perceived ease of use. This variable was measured with four Likert-scale items adapted from Davis (1993) ($M = 4.31$, $SD = 0.84$, $\alpha = .93$). Sample items included “Learning to use a video-based technology that facilitates real-time feedback from humans is easy for me” and “I find a video-based technology that facilitates real-time feedback from humans easy to use.”

Perceived technology satisfaction. This variable was measured with three Likert-scale items adapted from Islam (2014) ($M = 4.37$, $SD = 0.87$, $\alpha = .95$). Sample items included “I am satisfied with the function of a video-based technology that facilitates real-time feedback from humans” and “I am satisfied with my interactions with a video-based technology that facilitates real-time feedback from humans”.

Intention of future use of public speaking technology. This variable was measured with three Likert-scale items ($M = 3.61$, $SD = 0.95$, $\alpha = .89$). Sample items included “I intend to continue using a video-based technology that facilitates real-time feedback from humans in the future for other public speaking projects” and “I will continue to use a video-based technology that facilitates real-time feedback from humans frequently.”

DATA ANALYSIS

Instructor Survey (Qualitative Data)

Instructor surveys included qualitative questions as a way of gaining a better understanding of perceptions and experiences of the technologies that were not gathered from the quantitative survey questions. The open-ended questions were analyzed using a qualitative thematic analysis approach. In all, there were three open ended questions that resulted in eleven responses per question (33 in total). Data were thematized by questions to provide qualitative context to the quantitative data analysis (Tracy, 2019).

Student Survey (Quantitative Data)

To test the hypothesized model on students' intention to use technologies for enhancing public speaking skills, a path analysis using AMOS was conducted. The fit indices of the hypothesized model were assessed against the standards of a good model fit including root mean squared error of approximation (RMSEA) less than 0.06, standardized root mean square residual (SRMR) less than 0.08, and comparative fit index (CFI) in the range of .90. (Hu & Bentler, 1999). If the hypothesized model had a good fit, the study would then examine the coefficient of each hypothesized path.

RESULTS

RQ1 and H1–H4 were addressed by quantitative data collected from the student's survey on their technology use intention, whereas RQ2–RQ3 were examined by qualitative data collected from the instructor's survey.

Students' Technology Use Intention

Given that the number of students using the AI-based technology for automatic feedback was insufficient to conduct a quantitative analysis, the data reported focused on those who used the video-based technology that facilitates real-time feedback from humans. The model fit of the hypothesized model was adequate, $\chi^2(5) = 9.50, p = .09, CFI = .97, SRMR = .07$. Hence, the study proceeded to test the coefficients of each direct path.

R1 explored the nature of the association between communication competence and perceived technology usefulness. The results revealed that communication competence was negatively associated with perceived technology usefulness, although the association was marginally significant ($\beta = -.17, p = .077$).

H1 predicted a positive association between perceived ease of use and perceived usefulness. Consistent with this hypothesis, the data showed that when participants perceived the video-based technology that facilitates real-time feedback from humans as easier to use, they also found this technology to be more useful ($\beta = .61, p < .001$).

H2 predicted that perceived usefulness will be positively associated with technology satisfaction, whereas H3 predicted that perceived ease of use will be positively associated with technology satisfaction. Consistent with these hypotheses, the results revealed that when participants perceived the video-based technology that facilitates real-time feedback from humans as useful ($\beta = .27, p < .001$) and easy to use ($\beta = .72, p < .001$), they were more satisfied with this technology.

H4 predicted that technology satisfaction will be positively associated with intention for future use of technology. Consistent with H4, the data showed that when participants reported greater satisfaction with the video-based technology that facilitates real-time feedback from humans, they were more likely to use this technology in the future ($\beta = .36, p = .002$).

Instructors' Perceptions of Technology Use

A thematic analysis was used to examine instructors' perception of using technologies for enhancing students' public speaking skills (Tracy, 2019).

RQ2 focused on the technology features that instructor participants found useful for improving public speaking. The most prominent themes that emerged from instructor participants' qualitative

responses were *promoting self-reflection, facilitating peer-to-peer interactions, and assisting in providing feedback.*

Promoting Self-Reflection

Participants stated that technology, especially the video-based technology that facilitates real-time feedback from humans, enhanced students' experience because it allowed students to see how they improved over time by reflecting on their video recordings. For instance, one participant stated:
"It is a good resource for students to see how they perform and reflect on potential improvement."

Similarly, an instructor reported appreciating how the video-based technology that facilitates real-time feedback from humans, noting that it:

"allows the students to view their work in private first" and recognizing that students "take pride in seeing how they improve" and believe "learning to post business videos [will be] beneficial in their future."

Facilitating Peer-to-Peer Feedback

One key feature of the video-based technology that facilitates real-time feedback from humans appeared to be its opportunities for peer-to-peer interaction, especially evaluating other students' presentations. For example, an instructor participant said that the video-based technology that facilitates real-time feedback from humans

"... allows students to collaborate in an ongoing discussion in real time. There can be a back and forth, without the delay of a standard discussion board. This program is helpful for any type of class, but specifically a public speaking course where speeches must be evaluated."

Assisting in Providing Feedback

Another useful feature was the instructors' ability to annotate students' presentations. For example, an instructor stated,

"I like the fact that when using ... students have feedback that is time-stamped and can view their performance with comments and rubric in order to improve."

That is, a video-based technology that facilitates real-time feedback from humans seemed to provide more in the realm of pedagogical capacities (real time or time-stamped feedback, rubrics, peer-to-peer feedback, annotations, etc.) than an AI-based technology for automatic feedback, which may explain the discrepancies in perceived usefulness.

In contrast, the AI-based technology for automatic feedback received more critiques from instructor participants because its auto-generated feedback only focused on the delivery style (not the content). As a result, participants reported that the AI-based technology for automatic feedback was unable to recognize truly effective elements of verbal delivery, making this tool merely serve as a "stopwatch" or a recorder. For instance, an instructor described how the technology is

"not worth the cost, in time or in dollars ... I babbled and made nonsense noises for nearly a minute and was granted an excellent score for my pitch and pauses. Their computerized audience was pleased with my speech."

Another instructor echoed the concern about the AI-based technology for automatic feedback assessment of verbal delivery and stated,

"I literally spoke nonsense vocalizations with differing levels of pitch and pausing. I was given very high marks."

Another major concern with the AI-based technology for automatic feedback was its inability to consider the impact of the content on style choice and the possible cultural bias. For instance, one instructor participant said,

"their pause and pitch ratings do not take into consideration cultural factors (some cultures speak with different pitches) or deliberate choices (a student might choose to make a point through adjusting their pausing). The program faults them for this."

A similar comment was made by another participant,

"It does not take into account the incredible diversity of speaking styles and stylistic decisions among students. For example, some students choose to pause for longer than what your program deems acceptable. Some students deliberately choose to use flatter vocal variety for effect. Your program tells us this is not good."

Taken together, public speaking technologies were considered as useful by instructors if their features could facilitate reviewers (either peers or instructors) to offer feedback that promoted self-reflection instead of replacing people to give feedback.

In RQ3 we were interested in the type of support that instructors desired that could assist them in implementing public speaking technologies in their courses. Based on the qualitative responses, most respondents brought up the need of having an Information Technology (IT) staff member available to provide guidance and answer questions in a timely manner. One respondent explained a situation where a staff member had helped them in being supported in the process of incorporating technology in the classroom:

"Dr. X was a great help throughout this process. In the future, I would appreciate more of his type of support. Not only was he there to answer practical questions, he also provided suggestions for how to use the software."

These comments are important for institutions to hear as institutional support can be assumed as the foundational need for new technological implementations.

DISCUSSION

Using both quantitative and qualitative data interpretation, this study reveals decision-making surrounding the intention to adopt technologies for enhancing public speaking skills from the perspectives of both students and instructors in a Hispanic-serving institution. Specifically, this study gained insights into the features that instructors deemed useful in technologies designed for improving public speaking skills and the support that can facilitate their implementation of these technologies in classrooms. Notably, although the literature on the effect of technology (e.g., virtual reality) on enhancing public speaking performance is emerging (Reeves, Elliott, Curran, Dyer, & Hanna, 2021), this study is one of the few studies that explores the users' experience of using such technologies. Additionally, findings from this study demonstrated the critical role of perceived technology usefulness and ease of use in linking communication competence and students' intention to use technologies designed for improving public speaking skills. Overall, these findings provide practical implications for designing technologies to promote instructors' and students'

willingness to adopt these technologies to enhance public speaking, by identifying the factors that can influence their technology adoption decision. Theoretically, this study extends the application scope of the TAM to an underrepresented population and a novel technology context.

Consistent with the hypothesis and the extension of TAM (Estriegana, Medina-Merodio, & Barchino, 2019), students' perceived technology usefulness and ease of use positively predicted their satisfaction with technologies for enhancing public speaking skills, which further predicted their intention for future use. This process demonstrates that the evaluation of whether technology features can help students fulfill their needs and are compatible with students' previous experience are critical to motivate their decision to adopt technologies designed to improve public speaking. In fact, satisfaction with a particular technology has been proposed as the most prominent predictor of users' intention to use the technology in the long run (Franque, Oliveira, Tam, & Santini, 2021). This study extends the existing literature by identifying the role of user satisfaction in the adoption decision-making in a novel technological context.

Moreover, as an antecedent to perceptions of the technology features, communication competence was found to negatively predict students' perceived usefulness of technologies for enhancing public speaking skills. In other words, college students who are less proficient in communication can recognize the usefulness of a particular technology for enhancing public speaking and thus are motivated to adopt the technology, which is the prerequisite to benefit from technology. This result is consistent with the extension of the TAM proposing that people's perceptions of technology can be formed through individual differences and personal needs of use (Al-Nuaimi & Al-Emran, 2021). Moreover, whereas previous research has focused on the individual difference in general skills in technology use such as self-efficacy and computer anxiety (Granić, 2022), this study examines users' communication skill, which is a specific knowledge domain that the technology is designed to improve.

From the instructor's perspective, the study revealed that technologies could be helpful for teaching public speaking if they facilitate instructors to offer feedback instead of replacing instructors to provide feedback. Specifically, instructors believed that technologies designed for public speaking skill improvement were beneficial for them to provide time-stamped feedback. However, the lack of consideration of the content and the presentation context was considered as a major drawback for technologies offering AI-generated feedback. The qualitative results also demonstrated that instructors considered technologies to be useful to enhance students' public speaking skills as they enabled students to reflect on their presentation performance and facilitated their peer-to-peer feedback and interactions. Notably, instructors perceived a technology to be useful not only because it facilitated their teaching efficiency but also because such a technology could benefit students' learning experiences. These findings extend previous research on educational technology because previous research has only found video recording technologies to be useful for instructors if these technologies increased teaching efficiency (Hager, Fiechtl & Gunn, 2020).

Regarding the type of technology support that can facilitate the ease of use, instructors are expected to have information technology specialists available to handle potential technical issues and provide suggestions on how technologies can be incorporated into certain teaching activities. This result was consistent with Ardley & Hallare (2020) who also called for the need for extensive training by all instructor users and for accessible technical support.

IMPLICATIONS

The study offers both theoretical and practical implications. Theoretically, this study extends the application of the TAM to a novel context of technologies for improving public speaking skills. Within this context, the findings enrich the understanding of which users' characteristics (e.g., self-efficacy, experience) could shape their perceptions of a given technology by identifying communication

competence as a predictor of perceived technology usefulness. Moreover, different from prior research that examined technology adoption among general student populations, this study has focused on a sample of underrepresented population from a Hispanic-serving institution. The finding that the data were consistent with the TAM demonstrated the robustness of this theoretical framework.

Practically, the study also provides implications for technology design and technology training programs on campus. First, the quantitative results from students revealed that students who were less competent in communication were more likely to perceive the usefulness of a technology designed for improving public speaking. This result reflects the desire of students who need the most help for developing communication competence to use technology to enhance their skills. As such, instructors can incorporate technology into a required presentation project so that students who need the most help for developing communication competence can recognize a certain technology, experience its advantages, and be willing to adopt the technology for improvement. Additionally, the quantitative results showed that perceived ease of use served as a stronger predictor of technology satisfaction compared to perceived technology usefulness. This result suggests the importance of enhancing the usability of a technology, so that underrepresented students who are challenged by the digital divide can use and benefit from technologies in an equal way as their peers. For example, software developers can simplify the user interface that only includes controls directly connected to the users' major needs.

From the qualitative data, the results provide suggestions for software developers to design technology features that convince instructors of the effectiveness of technologies in teaching public speaking. First, software developers may consider incorporating features that promote social presence (e.g., peer reviews, time-stamped feedback) and enable self-reflection on presentation performance. Second, developers may also consider creating technology functions that aid instructors in providing feedback instead of offering automated feedback. The third implication is related to facilitating instructors' technology implementation. When introducing technology related to training public speaking skills, universities should provide information technology specialists who could solve technical issues related to technology implementation for instructors. Universities may also organize learning communities among instructors interested in adopting new technologies so that they can share advice and experiences on the best practices regarding integrating technologies into teaching activities.

LIMITATIONS

There are a few limitations of this study. First, the small size of the student and the instructor samples may limit the generalizability of the study findings. Responses to open-ended questions were gathered only from a few instructors to obtain their insights, and the study did not test the associations between perceived technology features and technology adoption decision among the instructor sample. A larger sample size of instructors will be necessary to test these associations. Second, because the study is a cross-sectional survey, the causal order in the relationship between perceived technology features and intentions of future technology use cannot be established. Third, this study only focused on video-based technology that facilitates real-time feedback from humans and an AI-based technology for automatic feedback, to examine the TAM and its extension. Future research may examine whether our findings can be replicated for other technologies designed to enhance public speaking skills.

FUTURE DIRECTIONS

As an exploratory study, our findings offer ample opportunities for future research. Two specific research ideas follow. First, because the data were collected before the COVID-19 pandemic, future research on how students and instructors perceive technologies for improving public

speaking skills after the pandemic is warranted. Second, our results revealed that when students perceived technology as useful and convenient, they were more satisfied with the technology. Thus, a future study could explore what denotes or defines technology as “useful” and then how instructors can apply those principles when using technology in their assignments.

CONCLUSION

In conclusion, this study applies the TAM to understand the decision-making of adopting technologies designed for improving public speaking skills from both the students’ and the instructors’ perspectives in a Hispanic-Serving Institution. From the students’ perspective, it was found that those who needed more help with developing their communication competence were more likely to perceive the usefulness of public speaking technologies. Moreover, students’ perceptions of technology usefulness and ease of use were positively associated with technology satisfaction, which further predicted their intentions of future technology use. From the instructors’ perspective, technologies were considered helpful for teaching public speaking if they could assist instructors in giving feedback. Additionally, having an information technology specialist on campus could facilitate instructors’ experience of implementing a new technology in their classrooms. These results not only extend the application of TAM to a novel technology and an underrepresented population but also provide practical suggestions for designing technologies for enhancing public speaking skills. Future research may recruit a larger sample to examine whether the findings can be replicated to other technologies and different populations after the pandemic. It is also beneficial to explore the features that students consider useful for technologies designed for enhancing public speaking skills.

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