

## A quantitative study on students' perception of online versus face-to-face education

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### Keywords

Curriculum, E-learning, Educational Program, Face-to-face or In-person Classes, Higher Education, Leadership, Management, Online learning.

### Abstract

*There are different opinions existing about the leadership crisis relating to the quality of education (Muenjohn, Pimpa, Montague, & Qin, 2016). Several authors believe that the role of contemporary business in Higher Education (HE) plays a significant role in resolving the leadership crisis (Muenjohn, Pimpa, Montague, & Qin, 2016; Bettinger & Loeb, 2017; Grincewicz, 2017). The focus of HE in this field also presents significant challenges to those who are responsible for developing the leadership curriculum in the HE context (Muenjohn, Pimpa, Montague, & Qin, 2016). Literature shows that business schools have long struggled with the problem of teaching leadership and developing suitable curricula to help graduates become skilled leaders, primarily through online programs (Muenjohn, Pimpa, Montague, & Qin, 2016). Moreover, with the coronavirus disease pandemic of 2019 (COVID-19) crisis, the online platform has proven to be an effective education delivery tool, but COVID-19 has challenged education for learners of all ages (Hoofman & Secord, 2021). The move to online education during COVID-19 resulted in negative educational changes and health implications for children and young adults enrolled in elementary, middle, high, college, and professional institutions (Hoofman & Secord, 2021). The consequences varied according to age, maturity level, and socioeconomic status. There is limited data on outcomes at the moment, but several oversight bodies have attempted to set recommendations, voiced concerns, and extrapolated from prior experiences (Hoofman & Secord, 2021). According to research, at least 50% of students participate in online courses as opposed to face-to-face courses in non-profit, Higher Education (HE) institutions. Relatively little research has explored the way students' performance in non-profit institutions is influenced by participating in an online course versus face-to-face course.*

*As a result of research completed on this topic, it is evident more in-depth information is needed regarding evidence to understand the impact of online learning versus face-to-face learning today and their effect on students' performance. The purpose of this quantitative study was to compare the way students' performance in non-profit institutions is influenced by participating in an online course versus face-to-face course. The Online and Face-to-face Education Evaluation Tool (OFFEET), developed by this researcher, was chosen as the measurement instrument for this study. Participants of this study were university students at non-profit universities/colleges, for this study, there were 314 participants. One-way multivariate ANOVAs were computed with scores on the researcher-developed instrument, OFFEET and the independent variables (i.e., two covariates (gender and age), household income, type of device used, and region within the United States. The results of this research determined that there is a statistically significant difference in the relationship between online versus face-to-face student performance in nonprofit universities.*

### 1) Introduction

There are different opinions existing about the leadership crisis relating to the quality of education (Muenjohn, Pimpa, Montague, & Qin, 2016). Several authors believe that the role of contemporary business in HE plays a significant role in resolving the leadership crisis (Muenjohn, Pimpa, Montague, & Qin, 2016; Bettinger & Loeb, 2017; Grincewicz, 2017). The focus of HE in this field also presents significant challenges to those who are responsible for developing the leadership curriculum in the HE context

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The specific problem is more in-depth information is needed regarding the way students' performance in non-profit institutions is influenced by participating in an online course versus face-to-face course (Bettinger & Loeb, 2017; Chingos, 2017), and across the four main categories for evaluating educational learning environments: student effectiveness, student performance, student engagement, and quality and knowledge of courses (Allen & Seamen, 2014; Bunn, Fischer, & Marsh, 2014; Bettinger & Loeb, 2017; Chingos, 2017; Kendrick & Goldstone, 2019).

The COVID-19 pandemic has had an impact on and will continue to have an impact on how knowledge and skills are taught at all levels of education. While the majority of children and adults will likely compensate for the disruption of traditional educational services by adapting to new modes of instruction, others may suffer (Allen & Seamen, 2014). The gap is expanding for people whose families are unable to absorb the instruction and supervision of education required for in-home education due to a lack of time and abilities. The gap is especially critical for students already at a disadvantage due to socioeconomic status, language, or special needs, who will have the most difficulty adjusting for the COVID-19 pandemic school closures and adaptation of online learning (Hoofman & Secord, 2021). For these reasons, the primary purpose of this study is to compare the way an online course versus face-to-face course impacts college student's performance.

## 2) Literature Review

### a. Online Education

Online education is a type of educational guidance provided to students using their home computers through the internet (National Center for Education Statistics, 2021). For a wide variety of non-traditional students, particularly those who choose to continue working full-time or raise families, online degrees and courses have become conventional alternatives over the past decade (Nonprofit Colleges Online, 2022). Online degree programs and courses are often provided through the online learning portal of the host institution, but others are implemented using external Technology (Bettinger & Loeb, 2017). While there are slight variations, the most significant distinction between online and traditional learning is that online study frees the student from the usual trappings of on-campus degree programs like commuting to school, preparing their day for courses, and being physically present during each cycle of their coursework. Also, online education also uses a technology-based delivery system (e.g., Moodle, Blackboard, Canvas) (National Center for Education Statistics, 2021). The delivery utilization of technology is a core difference.

The benefits of studying online depend a great deal on the student. While some students only love the ease of learning in their pajamas, some have to pursue online education to live with their children at home. Location is one of the most significant benefits that come with online degree programs (Bettinger, Fox, Loeb, & Taylor, 2017). Simply put, students can do their education from any location in the world. Online classes offer the promise of participation regardless of where students live or where they will enroll, possibly redefining educational options in conventional schools for students with less resources. In addition, online platforms provide the opportunity, through artificial intelligence, to provide the optimal course timing and material to suit the needs of each student and thereby increase the quality and learning of the education (Bettinger & Loeb, 2017). For instance, the new "intelligent" tutoring programs determine

the students' actual shortcomings and evaluate why students make particular mistakes. Such programs then change the teaching materials to match the needs of the students.

Online learning is prevalent and that, particularly in non-profit higher education institutions, relatively little research has explored the way student performance in college is influenced by participating in an online course versus face-to-face (Allen & Seamen, 2014; Bunn, Fischer, & Marsh, 2014; Bettinger & Loeb, 2017; Chingos, 2017; Kendrick & Goldstone, 2019). This study is the first in which the researcher plans to provide research data on the impact of full-scale online and face-to-face classes for non-profit institutions. Additionally, this study is the first to examine the consequences of participating in online and face-to-face classes at non-profit universities. Most importantly, is the way online and face-to-face classes can affect a student's performance. Nearly 3.4 million (full-time equivalent) undergraduate students studied in no-profit colleges during the 2017 academic year, 30 percent of all U.S. students attending four-year institutions (Chingos, 2017).

#### ***b. Non-profit Universities***

This study adds to the new and growing literature on non-profit colleges and universities. Research on non-profit institutions, and its stakeholders are increasingly essential to a complete understanding of the U.S. Higher Education (Chingos, 2017). Non-profit status is granted to established schools to achieve an educational goal rather than to generate profits. Non-profit businesses are forbidden to issue stock dividends or pay their owners, and all funds generated are put back into the company in the form of a reserve or used for capital or operating purposes. Non-profit businesses are excluded from federal corporate income taxes and can obtain direct public funds or are invested with charity. Therefore, non-profit institutions provide reduced tuition and other financial aid types (often tuition is not reduced and could be in some cases higher than that of for profit). For those reasons, the non-profit share of college enrollment and degrees is large. As mentioned earlier, nearly 3.4 million (full-time equivalent) undergraduate students studied in no-profit colleges during the 2017-2018 academic year, 30 percent of all U.S. students attending four-year institutions (Chingos, 2017). Non-profit colleges serve many non-traditional college students, who are often the focus of policy.

#### ***c. Effects of Online Education***

Bettinger and Loeb (2017) discussed the promises and pitfalls of online education. In their study, their research uses data from DeVry University, a major for-profit institution with an enrolment of over 100,000 students, 80 percent of whom are pursuing a bachelor's degree. The regular student at DeVry takes two-thirds of their courses online. The remaining one-third of students occur at one of DeVry's 102 physical campuses in traditional in-seating sessions. The estimates include more than 230,000 students enrolled in 168,000 sections in over 750 different classes. Bettinger and Loeb (2017) found that participating in an online course lowers student grades by 0.44 points on the standard point grading scale.

Furthermore, Bettinger and Loeb (2017) found that completing an online course lowers a student's GPA by 0.15 points in the next term. Moreover, looking instead at the next term GPA for courses in the same subject area or courses on which the course in question is a requirement, the researchers noted more significant decreases of 0.42 points and 0.32 points, respectively, providing significant evidence that students have learned less in the online environment. The researchers also consider that attending an online course rather than face-to-face raises the risk of dropping out of school. Students are around nine percentage points less likely to stay enrolled throughout the class after participating in an online course (Bettinger & Loeb, 2017). This decline was compared to an estimate of 88 percent of the remaining students enrolled in the following term.

On the other hand, the Coronavirus pandemic has apparently transformed the world of education, and professor's choice of remote working software for creating a virtual classroom has a direct influence on their success as an educator at this time. Not just classroom instruction, but also education administration, parent-teacher conferences, and staff and school board meetings have been overtaken by video conferencing software (Stone, 2020). Video conferring software like Zoom and Teams are replicating the traditional classroom as much as possible. This implies that professors using a video conferring software must foster a collaborative atmosphere in which students may engage naturally with one

another and with the teacher (Stone, 2020). However, there are also virtual communication challenges with video conferring software. Those challenges include the inability for students to focus on screens, technology issues, sense of isolation, and teacher training (Stone, 2020).

#### ***d. Student Performance and Leadership***

Academic performance is an important topic of concern in the educational system. Parents, teachers, students, policymakers, and society as a whole are all eager to see students succeed academically. Even without the essential structure and resources, everyone expects a consistently high degree of performance (Gyasi, Xi, & Owusu-Ampomah, 2016). Students' academic performance have been strongly linked with students' leadership skills. Nowadays, schools are under constant pressure to keep up with our culture's continuous rapid-fire developments. It is challenging to educate students for the future when we have no idea what that future will look like (Gyasi, Xi, & Owusu-Ampomah, 2016). As a result, educational leaders in this setting require a special skill set to ensure that students receive what they need, as well as, providing the best educational format. The widespread use of technology both in and out of the classroom, as well as increasing accountability for student accomplishment, have altered the educational environment dramatically (Gyasi, Xi, & Owusu-Ampomah, 2016).

The concept of leadership has long been of significance concerning managers in education and management student education, but the importance of leadership has been recognized in recent years (Iordanoglou, 2018). Cultivating good leadership has become even more focused on stakeholders and senior managers in organizations and academics. Cacioppe (1998) stated that the dramatic developments in business, technology, political and social influences had demanded solid leadership skills. As a result, leadership development initiatives have become a growing focus for corporate and government organizations.

Leadership development is an important and challenging problem in today's VUCA (Volatile, Uncertain, Complex, and Ambiguous) environment (Iordanoglou, 2018). Worldwide, companies are seeking to recognize and cultivate exceptional leaders who will be able to tackle the latest challenges, welcome transformation, cope with a crisis, fix real-life issues, and influence their organizations and society as a whole. However, leadership development methods have not proved sufficient to address the demands of the new era. A survey completed by Deloitte (2015) identified the need to strengthen, enhance, and re-engineer corporate leadership. The findings reveal that the conventional pyramid-shaped leadership growth model does not yield leaders quickly enough to keep up with market expectations and the speed of change (Deloitte, 2015). A similar finding was reported in a study undertaken by the Center for Creative Leadership, pointing out that "the essence of the problems posed by managers has evolved rapidly; yet the approaches we used to address them have remained the same" (Petrie, 2014, p. 5).

#### ***e. Online Education and Leadership***

Strong leadership skills are linked to the growth of a leader's work-life experience and the context in which that knowledge was learned (Bunn, Fischer, & Marsh, 2014). Although the literature is not completely clear, there is more support from it that this is the case, i.e., the literature supports the belief that skill development is linked to previous experience and learning context (Bettinger, Fox, Loeb, & Taylor, 2017). According to World Economic Forum research (2016), the demands of the 21st Century workplace increasingly require students to acquire a broader set of skills, such as cooperation and problem-solving, than previous generations. A college diploma is less crucial for many businesses than mastery of necessary skills (Calderon and Sidhu, 2014). The problem is as follows: Is it possible to substitute an online classroom for a regular face-to-face classroom? Is there a difference in the skills that students master between the two delivery methods?

Given that there is both a current need and availability of leadership skill acquisition services provided in several ways, there is another question as to whether or not these skills can only / can best be acquired by face-to-face interactions instead of an online learning environment that is mediated. Although there is limited literature on the use of computer simulations as part of the production of leadership, the literature appears to concentrate on the use of technology as part of face-to-face initiatives (e.g., see [17] Hill and Semler, 2001), instead of being part and parcel of programs distributed mainly or solely via an

online system, which are accessible remotely. Researchers from the Center for Excellence in Leadership (2004) have debated that these online channels help introduce new forms of leadership style or merely upholding existing trends. In response to this question, this research objective has been outlined (below). However, before determining the study's specific targets, some consideration will be paid briefly to the minimal literature available on ability growth (including leadership skills) using facilitated online learning environments.

**f. Face-to-face Education**

Face-to-face learning is an educational approach in which a cohort of students is taught the course's substance and the learning material in-person (Bunn, Fischer, & Marsh, 2014). Face-to-face learning enables live interactions between a teacher and a student (Bunn, Fischer, & Marsh, 2014). Lectures, capstones, team projects, labs, studios, and other features of traditional (Face-to-Face) education (also known as in-person) are all part of traditional (Face-to-Face) teaching. Teaching takes place synchronously in a physical learning environment (with adequate safety measures in place), which means that the students are "traditionally" in the same place simultaneously. Face-to-face interaction between the student and the educator and the students themselves is a significant asset of the traditional classroom. The teacher, as well as the other classmates, encourages the students.

A teacher's significance in the classroom goes beyond the class they are teaching. A teacher's responsibility is to excite, inspire, and oversee their students in order to get the most out of them - the latter being particularly challenging to achieve with video conferencing software. Technology can even be used in the classroom as a valuable adjunct to face-to-face instruction. For example, using animations, video content, and game-based learning helps students to reap the benefits of online learning tools while also being more successful than using only online learning (Bunn, Fischer, & Marsh, 2014).

Successful learning requires interactivity, personalization, and good communication (Bunn, Fischer, & Marsh, 2014). The classroom is unrivaled as a setting for offering helpful feedback. Two-way dialogue has been highlighted as one of the most successful communication forms, and it is especially crucial in education (Bunn, Fischer, & Marsh, 2014). This type of learning involves much back-and-forth; education is based on questions and answers, which is easiest to achieve when everyone is in the same room. It has the ability to transcend beyond teacher-student discourse in the classroom, including student-to-student and group learning interactions (Bunn, Fischer, & Marsh, 2014).

**g. Effects of Face-to-face Education**

Access to education might be hampered by a student's location and socioeconomic status. With face-to-face class sizes limited to the school's capacity and many schools only accepting students who reside nearby, solely providing face-to-face instruction could prevent some groups of people from learning. This is especially true in cases where education is not freely available. Face-to-face education offers the most benefits since it allows participants to debate, cooperate, rehearse, and role play in real-time with the help of a facilitator. Being a part of a group and being held accountable for one's actions are both effective learning techniques (Bunn, Fischer, & Marsh, 2014). On the other hand, many people find speaking in front of their peers intimidating, limiting their connection and feedback opportunities. When activities are hosted digitally, these students may find it easier to participate in class discussions (Bunn, Fischer, & Marsh, 2014).

**h. Face-to-face and Online Learning Modes**

The characteristics of face-to-face and online learning styles of instruction are similar. According to Drouin (2012) and Benton and Cashin (2012), face-to-face and online courses share some fundamental instructional elements. Interactions between students and instructors, teacher assistance and mentoring, lecture/content delivery quality, course material, and social networking platforms are examples of these, and are the best practices for online courses, according to Drouin (2012), that might also be used in face-to-face settings for student, peer, and self-ratings. Reissetter et al. (2007) investigated whether online and face-to-face learners are equally satisfied with their learning quality. Their findings revealed that, although

having vastly different learning experiences, both learning styles scored equally in learning results and satisfaction.

Solimeno et al. (2008) found that asynchronous collaborative learning online can increase professional skills that are generally obtained solely in small face-to-face educational settings when comparing the efficacy of face-to-face and online learning. Solimeno et al. (2008) stated in their research that online learning may be used to deliver creative educational possibilities tailored to the specific needs of students who struggle with time management in their learning strategies, have low anxiety, and have high problem-solving efficacy. Wuensch et al. (2008) evaluated the pedagogical characteristics of face-to-face and online lessons in their most recently completed face-to-face and online class, finding that students rate online lessons as far superior to face-to-face lessons regarding convenience and allowing self-pacing. However, they also rated online lessons as inferior in several other ways. As a result, both online and face-to-face teaching techniques have their own set of advantages and disadvantages.

Nonetheless, both forms can be enhanced by decreasing their weaknesses while preserving their strengths. Despite their differences, the two modes complement each other (Berger et al. 2008), making combining the two modes, referred to as "blended or hybrid learning," extremely essential. Schools are able to conceive, develop, and deliver effective blended programs as a result of this. On the contrary, this does not rule out the possibility of chronic flaws in blended learning (combining face-to-face and online learning). Jackson and Helms (2008) found that the blended/hybrid mode consistently displayed the same flaws as online. Helms emphasized that adding face-to-face interaction did not eliminate flaws.

Face-to-face learning's social component can be replicated online. Today's workforce can cooperate just as successfully thanks to technology like video conferencing and virtual classes. Participating in classes online also implies that people are not restricted from learning what they require when they require it. Face-to-face teachers can still have the same impact online and provide the same social advantages with slight changes, such as smaller training groups.

#### *i. Education and the COVID-19 Pandemic*

In December 2019, a novel coronavirus epidemic known as COVID-19 began in China and quickly expanded around the globe within a few months. COVID-19 is a viral infection produced by a novel coronavirus strain that targets the respiratory system (World Health Organization, 2022). COVID-19 has infected 94 million individuals and killed 2 million lives in 191 nations and territories as of January 2021 (World Health Organization, 2022). This pandemic has caused chaos on educational systems worldwide, affecting nearly 1.5 billion students. It has compelled the government to cancel national examinations and schools to close temporarily, discontinue face-to-face education, and rigidly adhere to physical distance. These events sparked higher education's digital transition and tested its capacity to adapt quickly and effectively. Schools incorporated technology available, developed learner and staff resources, constructed systems and infrastructure, implemented new teaching protocols, and redesigned curricula (Pham & Nguyen, 2020). However, although some schools transitioned well, others struggled, particularly those from underdeveloped nations with little infrastructure (Pham & Nguyen, 2020; Joaquin, Biana, Dacela, & A, 2020).

Inevitably, schools and other learning spaces have been forced to transition to fully online education as the globe fights to contain the virus's violent spread. Online learning is a term that refers to a learning environment that makes use of the Internet and other technical devices and tools to deliver and administer academic programs in a synchronous and asynchronous fashion (Usher & Barak, 2020). Synchronous online learning entails real-time interactions between the teacher and students, whereas asynchronous online learning occurs without regard for a student's schedule (Singh & Thurman, 2019). Within the framework of the COVID-19 pandemic, online learning has assumed the role of emergency remote instruction. However, migrating to a new learning environment has raised a number of significant concerns about policy, pedagogy, logistics, socioeconomic considerations, technology, and psychosocial factors (Donitsa-Schmidt & Ramot, 2020; Khalil et al., 2020; Varea & González-Calvo, 2020).

Government education organizations and schools hurried to produce foolproof policies on governance structure, teacher management, and student management using policies as a guide for online learning (Khalil, et al., 2020). Teachers used to more traditional modes of instruction were also compelled to embrace technology despite their lack of technological proficiency. Online learning seminars and peer assistance networks have been established to address this issue (Khalil, et al., 2020). Dropout rates increased among students for economic, psychological, and intellectual reasons. Academically, while students may essentially study anything online, learning may be less than optimum, particularly in classes that need face-to-face contact and direct engagement (Varea & Gonzalez-Calvo, 2021).

### 3) Research Question

Research shows that most previous studies indicated the need to research significant differences in students' performance between online learning and face-to-face learning (Muenjohn, Pimpa, Montague, & Qin, 2016; Bettinger & Loeb, 2017; Grincewicz, 2017; Hoofman & Secord, 2021). A knowledge gap exists in comparing students' performance of online courses versus face-to-face courses, especially in the non-profit, education sector. Are online students achieving outcomes equal to or higher than face-to-face students? The results of this study may serve multiple stakeholders such as Human Resource (HR) professionals, managers, employers, and, most of all, students in HE themselves.

Online learning is quite prevalent in society and growing, comparatively, little research exists as to compare the way participating in an online course versus face-to-face course impacts college student's performance (Bettinger & Loeb, 2017). Evidence on this question from non-profit institutions is particularly scarce. To answer this question, the following null and alternative hypotheses were formulated and examined by statistically analyzing the data gathered using the Online and Face-to-Face Education Evaluation Tool (OFFEET) survey instrument:

RQ: Is there a relationship between online and face-to-face student performance in a non-profit university?

H1: There is a relationship between online and face-to-face student performance in nonprofit universities.

Ho: There is not a relationship between online and face-to-face student performance in nonprofit universities.

### 4) Statistics

#### a. Methods

This quantitative study aimed to compare the way students' performance in non-profit institutions is influenced by participating in an online course versus face-to-face course. One-way multivariate ANOVAs were computed with scores on the researcher-developed instrument, Online and Face-to-Face Education Evaluation Tool (OFFEET) and the independent variables (i.e., two covariates (gender and age), household income, type of device used, and region within the United States.

#### b. Participant Demographics

Participants of this study were university students at non-profit universities. There were 314 participants in the study. Frequencies were computed for the two covariates (gender and age), household income, device type, and region. Frequencies were calculated instead of descriptive stats, as the data collected was not numeric. Table 1 and Table 2 present the frequencies of gender and age.

**Table 1.**

*Frequencies of Participant's Gender*

		Frequency	Percent
	Male	144	45.9
	Female	160	51.0
	Total	304	96.8
Missing	System	10	3.2
Total		314	100.0

Based on the frequencies, 51% of participants were female, and 45.9% were male; ten participants failed to answer the gender question. The ages of participants ranged from 18 to over 60 years of age. Participants from the age range of 30-44 constituted 35.4% of the sample. The other ages ranged from 18-29 (9.9%); 45-60 (22.9%); >60 (28.7%); with 3.2% of cases did not answer.

**Table 2.**  
*Frequencies of Participant's Age by Groups*

		Frequency	Percent
	18-29	31	9.9
	30-44	111	35.4
	45-60	72	22.9
	> 60	90	28.7
	Total	304	96.8
Missing	System	10	3.2
Total		314	100.0

This quantitative study aimed to evaluate whether a relationship between online versus face-to-face learning impacts a student's overall performance. Frequencies were computed on three other independent variables household income, region, and type of device used for online learning. Frequencies of household income ranges are presented in Table 3. Of respondents (n=314), 2.9% of responses ranged from zero to \$9,999 in annual household income, with 4.1% falling in the \$10,000-\$24,999 annual household income range.

**Table 3.**  
*Frequencies of Household Income*

		Frequency	Percent
	\$0-\$9,999	9	2.9
	\$10,000-\$24,999	13	4.1
	\$25,000-\$49,999	53	16.9
	\$50,000-\$74,999	46	14.6
	\$75,000-\$99,999	53	16.9
	\$100,000-\$124,999	39	12.4
	\$125,000-\$149,999	24	7.6
	\$150,000-\$174,999	12	3.8
	\$175,000-\$199,999	13	4.1
	\$200,000+	19	6.1
	I prefer not to answer	23	7.3
	Total	304	96.8
Missing	System	10	3.2
Total		314	100.0

Household income ranged from zero to over \$200,000 in annual income. Two major household income groups were more frequent than others; \$25,000-\$49,999 and \$75,000-\$99,999 constituted 16.9% of responses, with 3.2% skipping the question, and 7.3% of respondents preferred not to respond.

**Table 4.**  
*Frequencies of Participant's Region*

		Frequency	Percent
	East North Central	37	11.8
	East South Central	31	9.9
	Middle Atlantic	55	17.5
	Mountain	22	7.0
	New England	11	3.5
	Pacific	42	13.4
	South Atlantic	51	16.2



	West North Central	21	6.7
	West South Central	32	10.2
	Total	302	96.2
Missing	System	12	3.8
Total		314	100.0

Table 4 presents the information on the participant's region. The Middle Atlantic region yielded 17.5% of responses, whereas 3.8% did not answer. The South Atlantic region yielded 16.2% of responses, followed by East North Central with 11.8% respondents. The Pacific region yielded 13.4% of responses.

**Table 5.**  
*Frequencies of Types of Devices*

		Frequency	Percent
	iOS Phone / Tablet	139	44.3
	Android Phone / Tablet	81	25.8
	Windows Desktop / Laptop	58	18.5
	macOS Desktop / Laptop	20	6.4
	Other	6	1.9
	Total	304	96.8
Missing	System	10	3.2
Total		314	100.0

Table 5 shows data on the type of devices participants used. Of device choices, iOS Phone or tablet was used for the survey, which yielded 44.3% of responses, followed by Android Phone or Tablet with 25.8% of answers, and 18.5% for a Windows laptop or desktop. macOS Desktop or laptop resulted in 6.4% of responses, 1.9% stated another type of device; 3.2% of respondents did not answer the question.

Table 6 presents the frequencies of responses to the question: of *how respondents felt about online education*, which yielded that 48.69% found online education to be moderately effective. Conversely, 3.59% felt that online education was not at all effective. The following section presents the results of the statistical tests.

**Table 6.**  
*Responses to Question: How do you feel overall about online education?*

Answer Choices	Responses	
Not at all effective	3.59%	11
Slightly effective	17.65%	54
Moderately effective	48.69%	149
Very effective	20.59%	63
Extremely effective	9.48%	29
	Answered	306
	Skipped	8

## 5) Measures

### a. Statistical Analysis

To examine whether a relationship exists between OFFEET responses and university students (demographics). The multivariate ANOVAs were computed for OFFEET scores on the ten-item survey and the two covariates (gender and age). A MANOVA was used to examine the association between age as IV and OFFEET scores as DVs, the interaction between OFFEET scores and age was significant (Roy's Largest Root=0.029,  $F(1,10) = 0.106$ ,  $p < 0.05$ ). F-critical was 4.965 (see Table 7). Therefore, an interaction was found between age and scores on the OFFEET. Table 7 presents the result of the MANOVA on OFFEET

scores and age. The interaction was analyzed with Roy's Largest Root because we are looking at an interaction between one IV (age) and OFFEET scores.

A separate MANOVA was used to examine the association between gender as IV, and OFFEET scores as DVs, the interaction between OFFEET scores and gender was significant (Roy's Largest Root=0.275,  $F(1,10)=.793$ ,  $p<0.05$ ). The F-critical value was 4.965. Therefore, a positive relationship or interaction was found. Table 8 presents the result of the MANOVA on OFFEET scores and gender.

**Table 7.**  
*Multivariate ANOVA on OFFEET Scores and Age*

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
	How do you feel overall about online education?	.119a	1	.119	.133	.716
	How do you feel overall about face-to-face education?	.086b	1	.086	.148	.701
	How effective has online learning been for you?	.006c	1	.006	.005	.945
	How effective has face-to-face learning been for you?	1.362d	1	1.362	2.183	.141
	How improved is your performance after taking courses online?	3.992e	1	3.992	5.132	.024
	How improved is your performance after taking courses face-to-face?	1.991f	1	1.991	3.344	.068
	How engaged do you feel when taking online courses?	1.159g	1	1.159	1.215	.271
	How engaged do you feel when taking face-to-face courses?	1.384h	1	1.384	2.170	.142
	In general, do you think online courses are more effective, less effective, or about as effective as in-person classes to gain knowledge in a field and acquire specific skills?	1.853i	1	1.853	2.500	.115
	Online courses were comparable in quality and knowledge obtained to face-to-face courses I have taken.	.162j	1	.162	.106	.745

Univariate tests were computed for age and scores. Table 8 presents the univariate tests. Roy's Largest Root= 0.29 was used for analyses. Roy's Largest Root was chosen based on the strength of the relationship analyzed. Wilk's Lambda is great for the comparison of two separate test groups.

**Table 8.**  
*Univariate Tests for Age*

Effect	Value	F	Hypothesis df	Error df	Sig.
Intercept					
Pillai's Trace	.939	450.348b	10.000	293.000	.000
Wilks' Lambda	.061	450.348b	10.000	293.000	.000
Hotelling's Trace	15.370	450.348b	10.000	293.000	.000
Roy's Largest Root	15.370	450.348b	10.000	293.000	.000
Age					
Pillai's Trace	.065	2.042b	10.000	293.000	.029
Wilks' Lambda	.935	2.042b	10.000	293.000	.029
Hotelling's Trace	.070	2.042b	10.000	293.000	.029
Roy's Largest Root	.070	2.042b	10.000	293.000	.029

Univariate tests for gender were computed. Table 9 presents those results. Roy's Largest Root= 0.27 was used for the analysis of the interaction between OFFEET scores and gender. Table 10 presents the results of the MANOVA on OFFEET scores and gender. An interaction was observed showing a linear relationship between students' performance in a nonprofit university based on OFFEET scores. Further interpretation of the results presented in the section is discussed further in the next section of this chapter.

**Table 9.**  
*Univariate Tests for Gender*

Effect	Value	F	Hypothesis df	Error df	Sig.
Intercept					
Pillai's Trace	.954	612.097b	10.000	293.000	.000
Wilks' Lambda	.046	612.097b	10.000	293.000	.000
Hotelling's Trace	20.891	612.097b	10.000	293.000	.000
Roy's Largest Root	20.891	612.097b	10.000	293.000	.000
Gender					
Pillai's Trace	.040	1.224b	10.000	293.000	.275
Wilks' Lambda	.960	1.224b	10.000	293.000	.275
Hotelling's Trace	.042	1.224b	10.000	293.000	.275
Roy's Largest Root	.042	1.224b	10.000	293.000	.275

**Table 10.**  
*MANOVA on OFFEET Scores and Gender*

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
	How do you feel overall about online education?	.878a	1	.878	.987	.321
	How do you feel overall about face-to-face education?	1.818b	1	1.818	3.144	.077
	How effective has online learning been for you?	.492c	1	.492	.391	.532
	How effective has face-to-face learning been for you?	2.784d	1	2.784	4.499	.035

How improved is your performance after taking courses online?	1	.418	.530	.467
How improved is your performance after taking courses face-to-face?	1	1.404	2.350	.126
How engaged do you feel when taking online courses?	1	4.711	4.999	.026
How engaged do you feel when taking face-to-face courses?	1	.483	.754	.386
In general, do you think online courses are more effective, less effective, or about as effective as in-person classes to gain knowledge in a field and acquire specific skills?	1	1.883	2.541	.112
Online courses were comparable in quality and knowledge obtained to face-to-face courses I have taken.	1	1.211	.793	.374

## 6) Results

The objective is to examine whether a relationship exists between OFFEET responses and university students (demographics). The multivariate ANOVAs were computed for OFFEET scores on the ten-item survey and the two covariates (gender and age). A MANOVA was used to examine the association between age as IV and OFFEET scores as DVs, the interaction between OFFEET scores and age was significant (Roy's Largest Root=0.029,  $F(1,10) = 0.106$ ,  $p < 0.05$ ). F-critical was 4.965 (see Table 7). As a result, the researcher rejects the null hypotheses. Therefore, an interaction was found between age and scores on the OFFEET. In other words, there is a statistically significant different in the relationship between online and face-to-face student performance in nonprofit universities. Table 7 presents the result of the MANOVA on OFFEET scores and age. The interaction was analyzed with Roy's Largest Root because we are looking at an interaction between one IV (gender) and OFFEET scores.

A separate MANOVA was completed to examine the association between gender as IV, and OFFEET scores as DVs, the interaction between OFFEET scores and gender was significant (Roy's Largest Root=0.275,  $F(1,10) = 0.793$ ,  $p < 0.05$ ). The F-critical value was 4.965. As a result, the researcher rejects the null hypotheses. Therefore, a positive relationship or interaction was found. In other words, there is a statistically significant different in the relationship between online and face-to-face student performance in nonprofit universities. Table 8 presents the result of the MANOVA on OFFEET scores and gender.

Univariate tests were computed for age and scores. Table 8 presents the univariate tests. Roy's Largest Root= 0.29 was used for analyses. Univariate tests for gender were computed. Table 9 presents those results. Roy's Largest Root= 0.27 was used for the analysis of the interaction between OFFEET scores and gender. Table 10 presents the results of the MANOVA on OFFEET scores and gender. An interaction was observed showing a linear relationship between students' performance in nonprofit universities based on OFFEET scores. As a result, the researcher rejects the null hypotheses. Therefore, a positive relationship or interaction was found. In other words, there is a statistically significant different in the relationship between online versus face-to-face student performance in nonprofit universities.

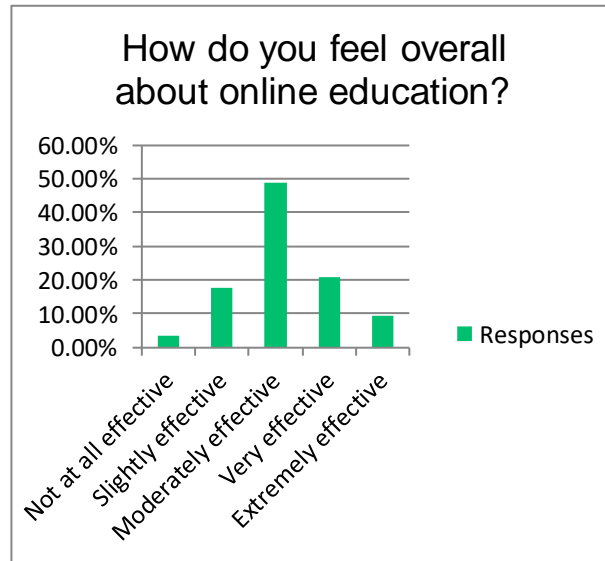
## 7) Presentation and Discussion of Findings

The following results will be presented in the four Operational Definitions of Variables: Student Effectiveness, Student Performance, Student Engagement, and Quality and Knowledge.

### a. Student Effectiveness

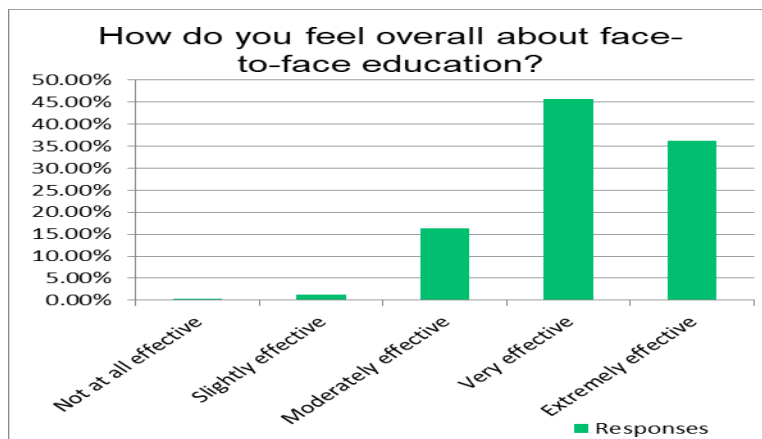
Student effectiveness was evaluated in the following survey questions: 1- *How do you feel overall about online education?* 2 - *How do you feel overall about face-to-face education?* 3 - *How effective has online learning been for you?* 4 - *How effective has face-to-face learning been for you?*

Figure 2.  
Response Percentage of Question 1



In response to question one, *how do you feel overall about online education?* The highest percentage is moderately effective 48.69%, and the lowest percentage is not at all effective 3.59%. The difference between the two scores is 45.10%. Based on most responses falling in the middle between “not at all effective” and “extremely effective,” calls to fruition the need for this study to be replicated with more than one university pool of participants. This will be further discussed in Chapter 5 under Findings and Conclusions.

Figure 3.  
Response Percentage of Question 2



In response to question two, *how do you feel overall about face-to-face education?* The highest percentage is very effective 45.75% and the lowest percentage not at all effective is 0.33%. The difference between the

two scores is 45.42%. Conversely from online effectiveness, the majority of responses found f2f learning to be very (45.75%) and extremely effective (36.27%); further interpretations are discussed in the next chapter.

Figure 4.  
Response Percentage of Question 3

In response to question three, *how effective has online learning been for you?* The highest percentage is



moderately effective 36.93% and the lowest percentage is not at all effective 7.52%. The difference between the two scores is 29.41%. Like question 2 responses, the majority found f2f to be very effective and extremely effective. Note, the similarity in questions 2 and 3.

Figure 5.  
Response Percentage of Question 4

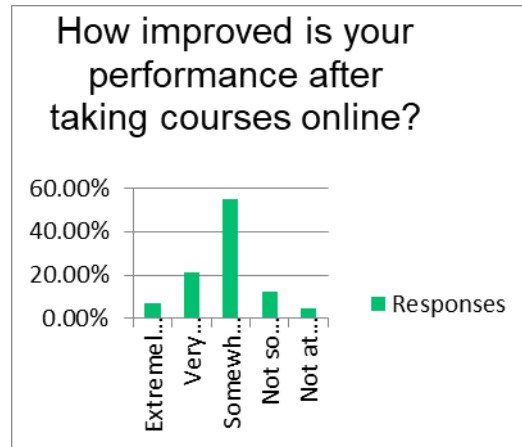


In response to question four, *how effective has face-to-face learning been for you?* The highest percentage is very effective 45.75% and the lowest percentage is not at all effective 0.98%. The difference between the two scores is 44.77%.

**b. Student Performance**

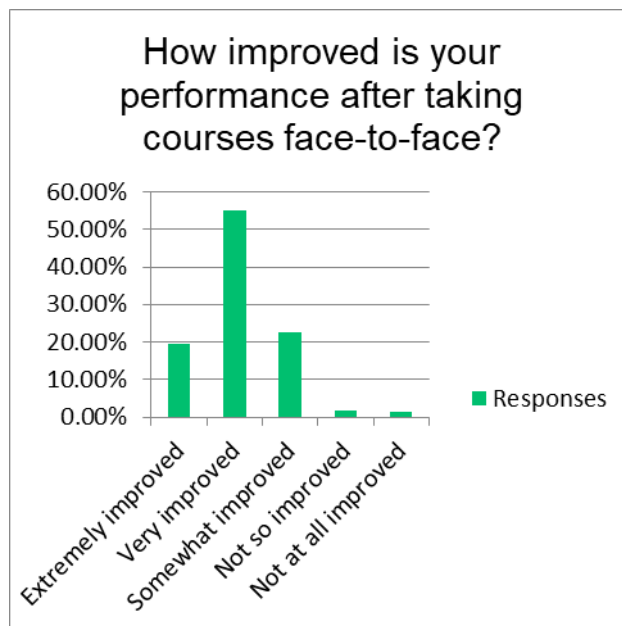
Student performance was evaluated in the following survey questions: 5 - *how improved is your performance after taking courses online?* 6 - *how improved is your performance after taking courses face-to-face?*

Figure 6.  
Response Percentage of Question 5



In response to question five, *how improved is your performance after taking courses online?* The highest percentage is somewhat improved at 55.23% and the lowest percentage is not at all improved at 4.58%. The difference between the two scores is 50.65%.

Figure 7.  
Response Percentage of Question 6

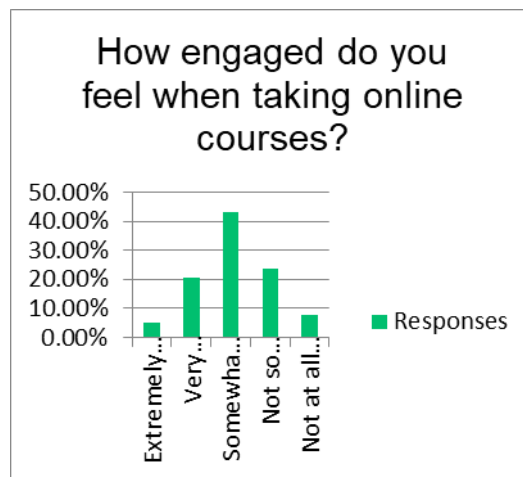


In response to question six, *how improved is your performance after taking courses face-to-face?* The highest percentage is very improved 54.90% and the lowest percentage is not at all improved 1.31%. The difference between the two scores is 53.59%.

### c. Student Engagement

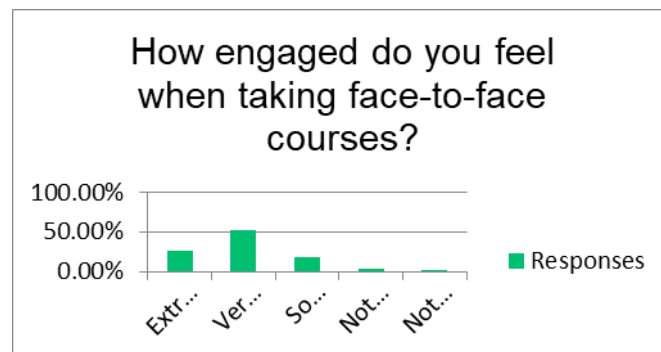
Student engagement was evaluated in the following survey questions: 7 - *How engaged do you feel when taking online courses?* 8 - *How engaged do you feel when taking face-to-face courses?*

Figure 8.  
Response Percentage of Question 7



In response to question seven, *how engaged do you feel when taking online courses?* The highest percentage is somewhat engaged 43.14% and the lowest percentage is extremely engaged 5.23%. The difference between the two scores is 37.91%.

Figure 9.  
Response Percentage of Question 8



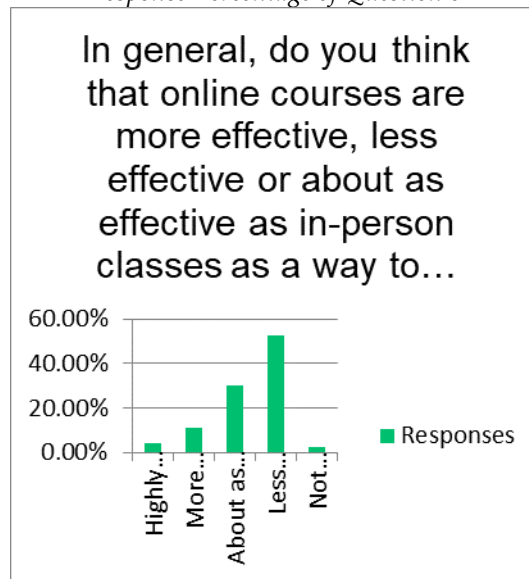
In response to question eight, *how engaged do you feel when taking face-to-face courses?* The highest percentage is very engaged 52.61% and the lowest percentage is not at all engaged 0.98%. The difference between the two scores is 51.63%.

### d. Quality and Knowledge

Quality and knowledge were evaluated in the following survey questions: 9 - *In general, do you think that online courses are more effective, less effective or about as effective as in-person classes as a way to gain knowledge in a field and acquire specific skills?* 10 - *Online courses were comparable in quality and knowledge obtained to face-to-face courses I have taken.*

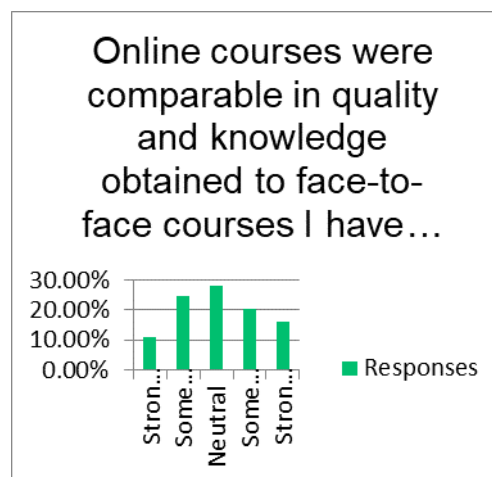


Figure 10.  
Response Percentage of Question 9



In response to question nine, *in general, do you think that online courses are more effective, less effective, or about as effective as in-person classes to gain knowledge in a field and acquire specific skills?* The highest percentage is less effective 52.61% and the lowest percentage is not effective 2.29%. The difference between the two scores is 50.32%.

Figure 11.  
Response Percentages of Question 10



In response to question ten, *online courses were comparable in quality and knowledge obtained to face-to-face courses I have taken.* The highest percentage is neutral 28.10% and the lowest percentage is not strongly disagreed 10.78%. The difference between the two scores is 17.32%.

#### 8) Implications of Study and Recommendations for Future Research

The findings of this study fit the rest of the literature in this field. Students' perceptions of face-to-face courses are higher than those of online courses. Researchers explain how students do not perform as well when they take courses online versus face-to-face. Students' GPA and grades in particular courses are lower when they participate in online courses. However, the current adverse impact of online courses

compared to face-to-face courses does not automatically conclude that one should avoid online courses. On the opposite, online courses give access to students who may never have the ability or the desire to take in-person classes.

Moreover, other studies have focused on a specific course, for instance, student's performance in an accounting, psychology, and math course. This study focused on the whole learning environment. Also, previous studies have focused on the student's GPA, whereas this study focused on four categories: student performance, student engagement, student effectiveness and quality and knowledge of both learning environments. Also, the instruments used in other studies are focused only on the delivery of the instructor or professor. The researcher in this study evaluated how both learning environments impact students' performance, engagement, effectiveness, quality, and knowledge. Furthermore, most of the work examining face-to-face and online delivery modes during the past decade has concentrated on comparisons with students in the k-12 or undergraduate at early stages (e.g., first-year, second-year student) (Allen & Seamen, 2014). This study explored students' perceptions of online versus face-to-face students' performance on master students in the non-profit education sector.

Future research should build upon the limitations of this study and add a qualitative component to enrich the study's findings. Another recommendation is to broaden the population internationally instead of one nation. The OFFEET tool could be translated into different languages (e.g., Spanish, French, Portuguese) to evaluate the way participating in an online course versus face-to-face course impacts students' performance and its view in other countries.

Future research could be geared specifically towards professors or a combination of both students and professors. This will ensure a more comprehensive and complete view of the way participating in an online course versus face-to-face impacts students' performance. Also, future research could be geared towards evaluating the way participating in an online course versus face-to-face course impacts students' performance at for-profit universities, public (state) universities, liberal arts colleges, and community colleges.

Another recommendation is to replicate this study with a larger sample size. A larger sample size will provide more data from which to draw comparisons and conclusions about the way participating in an online course versus face-to-face course impacts students' performance. These recommendations could indicate acceptable reliability in future studies when using the OFFEET instrument, which can range from 0.00 to 1.00, with values of 0.70 or higher.

## 9) Conclusion

The quantitative methodology used for this study was successful in integrating the theoretical and practical applications of the study. Online learning is quite prevalent in society and growing, comparatively, little research exists as to compare the way participating in an online course versus face-to-face course impacts college student's performance (Bettinger & Loeb, 2017). The analyses of this study were guided by the following research question: *Is there a relationship between online and face-to-face student performance in a non-profit university?*

This study was the first in which the researcher provided research data on the impact of full-scale online and face-to-face classes for non-profit institutions. This study was the first to examine students' perceptions of participating in online and face-to-face classes at non-profit universities. Most importantly, is the way online and face-to-face classes can affect a student's performance. A series of MANOVAs were conducted with five demographic variables as independent variables and with the scores from the OFFEET survey as dependent variables. This quantitative study was undertaken to investigate and explain any differences in the relationship between online versus face-to-face student performance in non-profit universities.

A MANOVA was used to examine the association between age as IV and OFFEET scores as DVs, the interaction between OFFEET scores and age was significant (Roy's Largest Root=0.029,  $F(1,10) = 0.106$ ,  $p < 0.05$ ). F-critical was 4.965. A separate MANOVA was used to examine the association between gender as IV, and OFFEET scores as DVs, the interaction between OFFEET scores and gender was significant (Roy's Largest Root=0.275,  $F(1,10) = .793$ ,  $p < 0.05$ ). The F-critical value was 4.965.

Univariate tests for gender and age were computed. Roy's Largest Root= 0.27 was used for the analysis of the interaction between OFFEET scores, gender and age. An interaction was observed showing a linear relationship between students' performance in nonprofit universities based on OFFEET scores.

The results of this research supported that a positive relationship or interaction was found. In other words, there is a statistically significant difference in the relationship between online and face-to-face student performance in nonprofit universities. Further, the results of this research decrease the knowledge gap that exists in comparing students' performance of online courses versus face-to-face courses, especially in the non-profit, education sector.

Future research should build upon the limitations of this study and add a qualitative component to enrich the study's findings. The results were mixed yet provided implications for future research and how to impact positive social change within the educational community. The contribution of this study may extend the foundational research of online learning and face-to-face learning, master students, and leaders in higher education will be able to use the results of this study and apply them in a manner in which they deem the most appropriate to benefit the university.

#### 10) Limitations of the Study

There were several limitations to this study. The first limitation is the population. The sample was for master students in the United States. In research, trying to validate an assessment tool is crucial to the reliability of the study. Future research could be geared towards different populations (i.e., demographics, and location). For instance, the OFFEET instrument can be translated into different languages, for example Spanish, French, and Portuguese, to evaluate students' perceptions of online versus face-to-face education in countries other than the United States of America.

Also, this study only evaluated the way participating in an online course versus face-to-face course impacts students' performance at non-profit universities. Future studies could include evaluating the way participating in an online course versus face-to-face course impacts students' performance at for-profit universities, public (state) universities, liberal arts colleges, and community colleges.

Another limitation of this research was that it was geared only towards the students, which might have limited the reliability of the survey tool. Future research could be geared specifically towards professors or a combination of both students and professors. This will ensure a more comprehensive and complete view of the way participating in an online course versus face-to-face course impacts students' performance.

Moreover, although the OFFEET has been tested for validity and reliability and the questions have been worded to enhance the accuracy of the answer, the survey tool still may not cover all of the educational values that students are concerned with in online learning and face-to-face learning, and this poses another limitation to the study and its findings.

The researcher noted an instrument issue. In this study, the reliability coefficient was -0.815, which indicates a low level of internal consistency. The researcher had hoped for a better reliability coefficient. Future studies using the OFFEET instrument should focus on the reliability coefficient, which can range from 0.00 to 1.00, with values of 0.70 or higher indicating acceptable reliability (George & Mallery, 2022). If the instrument is going to be used to predict future behavior, the instrument needs to be administered to the same sample at two different time periods and the responses will need to be correlated to determine if there is concurrent validity (George & Mallery, 2022). These measurements can be examined to aid the researcher in making informed decisions about revisions to the instrument.

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