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STUDENTS' PERCEPTION OF AND ENGAGEMENT IN REACTIVE ONLINE EDUCATION PROVIDED DURING THE COVID-19 PANDEMIC

Research article

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Abstract

One of the consequences of the COVID-19 pandemic was school closures, which was also the case in North Cyprus. As a response to school closures, universities switched to online education. This study aims to investigate students' perception of and engagement in this reactive online education provided during the pandemic. To investigate the issue, an online survey was used. Forty-six college students responded to the survey and the results indicate that students had an overall negative perception of their experience in online education. However, they demonstrated high engagement with online education and had higher academic achievement in the semester when education moved online than the previous semester. Results have implications for future online course offerings during moments of crisis in considering possible factors that contribute to positive attitude, motivation, engagement, and academic achievement.

Keywords: Online education, traditional education, face-to-face education, online student engagement, COVID-19

1. Introduction

2020 has been a significant year in the history of mankind because of the effects of the coronavirus pandemic, which has influenced all aspects of life. Many people lost their lives; the health sector was greatly hit; economies were drastically shaken globally; many people lost their jobs. Even the way people live has changed significantly. One sector that has been substantially influenced by the pandemic is education because the first reaction of most governments around the world was to shut down schools. According to UNESCO, by the first week of April 2020, within several weeks after the pandemic accelerated around the world, over 1.5 billion students in 194 countries were affected by country-wide school closures, accounting for 91.3% of total enrolled students, which later dropped to over 60% in July, still affecting over one billion students worldwide.

One such place is North Cyprus where the schools were shut down by the local government on the day the first coronavirus case was confirmed. After a week of uncertainty, the Higher Education Planning, Evaluation, Accreditation, and Coordination Council decided that the universities in North Cyprus should start delivering education online on March 23, 2020, and the universities began to teach online. Online learning could be defined as "the use of the Internet to access learning materials; to interact with the content, instructor, and other learners; and to obtain support during the learning process, in order to acquire knowledge, to construct personal meaning, and to grow from the learning experience" (Ally, 2008, p. 17). Anderson (2008) argues that quality learning necessitates learning to be knowledge-, community-, assessment, and learner-centered, which is also the case for online learning where learners could interact with the content, with the teacher, and with each other to maximize their learning. Several benefits of online education have been mentioned. For instance, online education is

not bound by time or location. Students can participate in learning activities from a different location than the campus and they can do them in their own time, which provides flexible and accessible learning opportunities. Online education could also incorporate real-time interaction. Since online content could be continuously updated, learners could often reach revised, up-to-date, and relevant materials. Besides, online learning is a form of situated learning where students do not just receive content from the instructor but they learn through activities and online interactions. Another benefit is that online education could increase access to education by allowing people who cannot receive formal education on campus to receive education online. Thus, it could increase the number of people with access to education (Ally, 2008; Bennett, Marsh & Killen, 2007; Goodman, Melkers, Pallais, 2016).

Various disadvantages have also been documented. For example, Lee and McLoughlin (2010) emphasize that geographical isolation takes away from social interaction, which could lower students' sense of belonging and consequently their motivation and desire to learn. They also list a lack of immediate feedback due to a lack of face-to-face interaction, time management issues, students' lack of experience with distance learning and technical knowledge, and lack of access to support and student services as potential disadvantages of distant learning, which also incorporate online education.

Since people are used to formal face-to-face education which has traditionally been the norm of education, people may relate to it differently than formal face-to-face education. Thus, some studies investigated students' perceptions of and satisfaction with online education as well as comparing both forms of education. Palmer and Holt (2009), for instance, investigated the factors that contribute to students' satisfaction with online learning via a survey with 761 students enrolled in wholly online units at a university in Australia. They found that 44.8% of the students were satisfied while one-third was unsatisfied. Moreover, the researchers identified that students are satisfied if they feel confident about their ability to communicate and learn online; if they know clearly what is required to succeed; and if they believe they are performing well in the unit. Eom, Wen, and Ashill (2006), on the other hand, found in a survey study with 397 college students from various fields of study that course structure, instructor feedback, self-motivation, learning style, interaction, instructor's knowledge, and facilitation had a significant effect on user satisfaction in online education.

In another survey study conducted with business majors at a university, Astani, Ready and Duplaga (2010) found that students had overall positive perceptions about online learning and they rated the quality of online learning as good as the traditional face-to-face learning. Another important finding was that satisfaction with online learning increased as the experience with online learning increased. Students who previously took four or more online courses demonstrated higher overall satisfaction than students who did not take online courses previously. Kuo, Walker, Schroder, and Belland (2014) investigated factors that could potentially influence student satisfaction levels in online courses. Responses to a survey from 180 students were analyzed. The results demonstrated that learner-content interaction was the strongest predictor of satisfaction. Learner-instructor interaction was also a significant predictor, though not as strong as learner-content interaction. Researchers found that learner-learner interaction, internet self-efficacy, and self-regulated learning were not a predictor of satisfaction and that academic program had an effect. They conclude that course design and appropriate online delivery should be at the center of attention while planning. Similar results were also reported in Kuo, Walker, Belland, and Schroder (2013). In El Mansour and Mupinga's (2007) study, students identified positive experiences with an online course as convenience, class expectations, and instructor availability and negative experiences as technology hiccups and feeling lost in cyberspace.

To compare online education with face-to-face education, Johnson and Palmer (2015) investigated online and face-to-face versions of a linguistics course at a university. They found that students in face-to-face courses achieved a higher GPA. More successful students tended to enroll in face-to-face courses. They were also more engaged. Students believed that interaction is needed for success and it could be achieved better in the traditional face-to-face format. Students mostly took online courses because of convenience and they regarded the ability to review recorded content as an advantage of online education.

Similarly, Tratnik, Urh, and Jereb (2019) studied student satisfaction in an online and a traditional face-to-face business English class. They used a survey from 110 students at the University of Maribor to investigate the issue. They found that students were overall more satisfied with the face-to-face format than the online format of the course. The factors that contribute significantly to student satisfaction were course delivery, course quality, students' expectations, motivation, student-student interaction, and perceived level of knowledge acquisition. Interestingly, teacher-student relationship and interaction were not among these factors. They conclude that the lower level of satisfaction with online learning may be due to a lower level of online learning motivation.

Other research that investigated student retention and dropout in online programs and courses (Frankola, 2001; Herbert, 2006; Sorensen & Donovan, 2017; Willging & Johnson, 2009) identified the following factors: becoming too busy with work and/or family, being more time-consuming, not receiving the necessary support and feedback from faculty, advisors and technical staff, lack of one-to-one interaction, finding the course material and the technology too difficult, having too many low-level assignments, difficulty working on the group assignments, financial reasons, not receiving a quality education, the instruction being too de-personalized and lack of technical preparation.

Another factor that has been considered about online education is student engagement. Normally, student engagement is considered a factor that is essential in online courses as it could facilitate learning and student satisfaction (Martin & Bolliger, 2018). Conrad and Donaldson (2004) cite various names that have been used to refer to the phenomenon such as active learning, social cognition, constructivism, and problem-based learning and assert that student engagement is learner-centered where the learner is also responsible for knowledge generation, where students and the teacher work together to construct knowledge. Coates (2005, p. 26) states “the concept of student engagement is based on the constructivist assumption that learning is influenced by how an individual participates in educationally purposeful activities.” Conrad and Donaldson (2004, p. 7) add that “engaged learning stimulates learners to actively participate in the learning situation, and thus gain the most knowledge from being a member of an online learning community” and this is essential for success in online education.

Roulston, Pope, Paulus, and deMarrais (2018) investigated student perceptions of learning in a fully online program in qualitative research design. They interviewed 31 graduate students over two years as they engaged in an online certificate program. They identified three major processes of student engagement, namely, learning to value the course design and structure, make authentic connections in the absence of physical proximity, and appreciate feedback from others. These three aspects defined the experiences of students with the online course. In the same vein, Martin and Bolliger (2018) refer to three dynamics of online courses that could potentially increase students' online engagement, namely student-content, student-student, and student-instructor. Through such interactions, students are likely to be engaged with the online courses. In their survey study with 155 students, they found that students deemed learner-to-instructor interaction more important than learner-to-content, followed by learner-to-learner.

In open-ended questions, however, they most commonly mentioned course materials, discussions, instructions/guidelines, instructor feedback, and instructor interaction/presence as the most valuable strategies to engage them as an online learner, somewhat contradicting the order they mentioned in their survey responses. When it comes to the least valuable strategies, students felt online discussions, group projects, synchronous meetings, and long text readings were the least valuable.

These cited works were conducted in ordinary conditions where students chose to enroll in online courses and instructors were normally offering online courses. This is different from the context of this study where the stakeholders were unprepared for it as it was an immediate response to school closure because of the coronavirus pandemic. Administrators, staff, faculty members, and students were unprepared for a switch at this scale in such a short time. Conrad and Donaldson (2004) assert that at the beginning of an online course, preparations take an instructor longer time than face-to-face courses until they can teach a successful course. It is reasonable to assume that it would take time for students as well to be prepared for online education. Hence, it is important to assess this new and unexpected condition from various perspectives including students' attitudes towards such an online education, which could be referred to as reactive online education. This new condition is different in that the students were not enrolled in online programs. Their aim was to receive their education in the traditional face-to-face format. In this respect, their reaction to this new situation may be different from those students who were already in online programs who were examined in previous research. Thus, this study aims to investigate students' perception of and engagement in reactive online courses offered as a response to the crisis triggered by the coronavirus pandemic. The study seeks to test the following hypothesis:

H1: The students will demonstrate an overall negative attitude towards reactive online teaching.

H2: The students who react favorably to online teaching will also rate high in online student engagement.

H3: The students will have a lower GPA in the spring semester than in the fall semester.

2. Methods

2.1. Research design

A mixed-method design was adopted in this study because investigating students' engagement, perceptions and attitudes necessitated both quantitative and qualitative investigation. Likert scale items in the survey and students' GPAs provided the quantitative data whereas open-ended questions yielded qualitative data. While quantitative data was used to establish the level of engagement and preferences, qualitative data was utilized to scrutinize factors that would influence students' experiences in reactive online education.

2.2. Participants and context

The study was conducted in the spring of 2020 at a university in North Cyprus. The participants of the study were 46 college students enrolled in two undergraduate degree programs awarding teaching degrees. All the students were normally enrolled in traditional formal face-to-face degree programs and taking their classes in such format. Only four participants reported that they took online classes before this experience and two of those were nonacademic courses (e.g. online drawing class). However, in the third week of the spring semester in March 2020, upon the confirmation of the first coronavirus case in North Cyprus, all the educational institutions including the universities were closed by the government. After

a week of uncertainty, the universities started to offer online education. The participants began to take all their classes online. The classes included weekly synchronous sessions as well as offline tasks including quizzes, assignments, discussion forums, video observations, presentations, essays, and report writing, etc. The synchronous sessions allowed the students to interact with the instructor and other students either through voice or through chat screen. The sessions were all recorded and made available on the learning management system of the respective courses for students to replay if they so wish. The students and the instructor were also frequently in contact via email and a popular text-messaging app. While all the education was transitioned to online environment, twelve participants reported that they are not good at computer/information technology. Participants were labeled P1 through P46 based on the order in which surveys were submitted online. Tables 1 and 2 outline the age and sex of the participants.

Table 1. *Age*

	Frequency	Percent
18-20	19	41.3
21-23	20	43.5
25-37	5	10.9
No response	2	4.3
Total	46	100.0

Table 2. *Sex*

	Frequency	Percent
Female	23	50.0
Male	22	47.8
No response	1	2.2
Total	46	100.0

2.3. Data collection and analysis

For the study, an online survey was used based on two previously developed scales. One was a perception survey about online and traditional education (Otter et al. 2013) and the other was an online engagement scale (OSE) (Dixson, 2010; 2015), which were piloted and validated by the developers. Some of the questions in the perception survey about online versus traditional education did not apply to the current situation and were thus removed (e.g. Most students take online courses because they believe that online courses are easier than traditional courses). The survey was also given in a 5-point scale rather than a 7-point scale for survey consistency although the more points in the scale are likely to give statistically more valid results (Wu & Leung, 2017). The survey also included several open-ended questions. Upon obtaining human subjects ethics committee approval from the institution and informed consent of the participants, the survey was shared as a link on the course management system at the end of the Spring of 2020 when students completed the reactive online education. The data gathered from 46 participants was then analyzed. The perception survey was analyzed using a one-sample Wilcoxon signed ranked test and the medians were compared to the scale median to see if their choices significantly deviate from the scale median. The average score of the online engagement scale was also compared to the scale median using a one-sample Wilcoxon signed ranked test. Cronbach's alpha coefficients were calculated for both scales and the whole survey and the results were .764, .921, and .892. The reliability of the perception survey was

acceptable and it was excellent in the online engagement scale while it was good in the whole survey. Correlation coefficients were also calculated for the relationship between the OSE and the individual items of the perception scale. The qualitative data obtained from the open-ended questions was analyzed using qualitative content analysis. Initial coding was done and then labels were created. Then, these codes were grouped into themes by analyzing tendencies and trends, which were then interpreted. This analysis yielded five major thematic categories, some of which also include subcategories. These categories are presented in the results section. However, the data was analyzed only by the researcher, which is a limitation in terms of the reliability of the coding and the analysis of the qualitative data.

3. Results

3.1. Perception of online and traditional education

The first part of the survey, the perception of online and traditional courses, was analyzed using a one-sample Wilcoxon signed-rank test. The objective was to see if the observed median of students' answers for each item deviates from the median of the scale, indicating a significant tendency. The analysis revealed that students demonstrated a significant tendency in their responses to 16 items. Only five items did not result in a significant difference from the scale median. Students did not make a difference between the online and traditional courses in terms of time required, need for a teacher, ability to cheat, willingness to spend time on coursework, and being disciplined.

Table 3. *Means and one-sample Wilcoxon signed-rank test results of student perceptions*

	N	Mean(SD)	Mdn	*z*	*P*	*r*
1. Online courses provide a better learning experience than traditional courses.	46	1.87 (1.16)	2.00	-4.487	.000**	-0.661
2. Online courses require more of a student's time than traditional courses.	46	3.39(1.55)	4.00	1.430	.153	-
3. An online course does not really need a teacher - it usually ends up being "self-directed learning."	46	2.74(1.45)	3.00	-1.279	.201	-
4. The overall quality of online courses is better than that of traditional courses.	46	1.76(1.09)	1.00	-4.895	.000**	-0.721
5. The amount of material that is presented to students in an online course is greater than in a traditional course.	46	2.37(1.32)	2.00	-2.774	.006**	-0.409
6. Online courses are easier than traditional courses.	46	2.13(1.37)	2.00	-3.702	.000**	-0.545
7. Students receive better quality teaching from online courses than they receive from traditional courses.	46	1.80(1.12)	1.00	-4.795	.000**	-0.706
8. It is easier for students to cheat in online courses than in traditional courses.	46	3.07(1.46)	3.00	.291	.771	-
9. Students feel more disconnected from other students when taking online courses than when taking traditional courses	46	4.26(1.08)	5.00	4.928	.000**	0.726
10. Students learn more in online courses than they learn in traditional courses.	46	1.89(1.14)	1.00	-4.593	.000**	-0.677
11. Students feel more disconnected from their teachers when taking online courses than when taking traditional courses.	46	3.91(1.22)	4.00	3.925	.000**	0.578

12. Students are more satisfied with online courses than they are with traditional courses.	46	1.93(1.18)	1.00	-4.498	.000**	-0.663
13. Students must be more self-motivated when taking online courses than when taking traditional courses.	46	3.78(1.33)	4.00	3.235	.001**	0.476
14. Students must be more willing to "teach themselves" when taking online courses than when taking traditional courses.	46	3.63(1.32)	4.00	2.623	.009**	0.386
15. Students who take online classes are more willing to spend the time on coursework than traditional classes.	46	2.67(1.49)	3.00	-1.485	.137	-
16. Students must spend more time reading course materials on their own when taking online courses than when taking traditional courses.	46	3.57(1.14)	3.00	2.868	.004**	0.422
17. Students who take online courses must be more disciplined in their studying than traditional courses.	46	3.37(1.38)	3.00	1.804	.071	-
18. Professors are more available to students in online courses than in traditional courses.	46	2.41(1.25)	2.00	-2.775	.006**	-0.409
19. Professors give feedback to students quicker in online courses than in traditional courses.	46	2.54(1.29)	3.00	-2.175	.029*	-0.320
20. Professors give better quality instruction in online courses than in traditional courses.	46	2.20(1.18)	2.00	-3.627	.000**	-0.534
21. Professors like teaching online courses.	46	2.46(1.06)	3.00	-2.997	.003**	-0.441

**. Result is significant at the 0.01 level (2-tailed).

*. Result is significant at the 0.05 level (2-tailed).

Among the ones that produced significant results, nine yielded a large effect size. Basically, students feel disconnected from other students when taking online courses ($z = 4.928$, $p < .05$) and they disagree with the following: the quality of online education is better ($z = -4.895$, $p < .05$); students receive better quality teaching from online courses ($z = -4.795$, $p < .05$); students learn more in online courses ($z = -4.593$, $p < .05$); online courses provide a better learning experience ($z = -4.487$, $p < .05$); students are more satisfied with online courses ($z = -4.498$, $p < .05$); online courses are easier ($z = -3.702$, $p < .05$) and professors give better quality instruction in online courses ($z = -3.627$, $p < .05$). Students also feel disconnected from their teachers online ($z = 3.925$, $p < .05$). These results show that students strongly disagree with positive statements about online education, a clear indication of a negative perception of their experience with reactive online education. The other items that yielded significant results led to moderate effect size. Table 3 depicts these results. It could be concluded that students had an overall negative perception of their experience in online courses as compared to traditional face-to-face courses.

3.2. Online student engagement

In addition to students' perceptions of online education as opposed to traditional face-to-face education, the researcher has also investigated students' level of engagement with online courses that they had to take because of the COVID-19 pandemic with respect to skills, emotion, participation, and performance engagement. Of the 19 items, 12 resulted in significant results, 11 at .01 level.

Table 4. *Means and one-sample Wilcoxon signed-rank test results of online student engagement*

	N	Mean(SD)	Mdn	*z*	*p*	*r*
1. Making sure to study on a regular basis	46	3.22(1.15)	3.00	1.300	.194	-
2. Putting forth effort	46	3.67(1.07)	4.00	3.501	.000**	0.516
3. Staying up on the readings	46	3.43(1.00)	3.00	2.628	.009**	0.387
4. Looking over class notes between getting online to make sure I understand the material	46	3.59(.95)	4.00	3.517	.000**	0.518
5. Being organized	46	3.48(1.24)	4.00	2.488	.013*	0.366
6. Taking good notes over readings, PowerPoints, or video lectures	46	3.28(1.08)	3.00	1.794	.073	-
7. Listening/reading carefully	46	3.59(1.10)	4.00	2.987	.003**	0.440
8. Finding ways to make the course material relevant to my life	46	3.41(.93)	3.00	2.739	.006**	0.403
9. Applying course material to my life	46	3.20(1.08)	3.00	1.253	.210	-
10. Finding ways to make the course interesting to me	46	3.67(1.09)	4.00	3.446	.001**	0.508
11. Really desiring to learn the material	46	3.54(1.11)	3.00	2.811	.005**	0.414
12. Having fun in online chats, discussions or via email with the instructor or other students	46	2.78(1.47)	3.00	-1.208	.227	-
13. Participating actively in small-group discussion forums	46	3.00(1.31)	3.00	-.065	.949	-
14. Helping fellow students	46	3.59(1.12)	3.00	3.124	.002**	0.460
15. Getting a good grade	46	3.76(.99)	4.00	3.846	.000**	0.567
16. Doing well on the tests/quizzes	46	3.61(.93)	4.00	3.549	.000**	0.523
17. Engaging in conversations online (chat, discussions, email)	46	3.46(1.13)	3.00	2.607	.009**	0.384
18. Posting in the discussion forum regularly	46	3.04(1.19)	3.00	.071	.944	-
19. Getting to know other students in the class online learning	46	2.65(1.21)	3.00	-1.897	.058	-

Five of these items led to a strong effect size. Students believe that they are getting good grades ($z = 3.846$, $p < .05$), doing well on assessments ($z = 3.549$, $p < .05$), looking over class notes between sessions ($z = 3.517$, $p < .05$), putting forth effort ($z = 3.501$, $p < .05$), making the course interesting to themselves ($z = 3.446$, $p < .05$). The remaining items that resulted in a significant difference yielded a moderate effect size. Table 4 outlines the results of the online engagement scale. The results show that performance engagement yielded the highest mean scores followed by emotional engagement and skills engagement. The lowest mean scores were retrieved in participation engagement. Four of the items in the participation category did not result in a significant difference. This shows that although students were engaged with the course to do well in the course, they could not engage in it by participating in the course, possibly showing that students found it difficult to connect with the course and the parties involved in an online environment.

The overall mean score from the online engagement scale also led to a significant result with a moderate effect size ($z = 3.26$, $p < .05$). This shows that students were engaged with the online courses. Table 5 depicts this result.

Table 5. *Mean and one-sample Wilcoxon signed-rank test result of OSE average*

	N	Mean(SD)	Mdn	*z*	*p*	*r*
OES Mean	46	3.367(.723)	3.36	3.264	.001	.48

3.3. Correlation between student perception and online student engagement

Correlations between the result of the online engagement scale and the items in the perception survey were also calculated and eight items were positively correlated. Except for one item with low correlation, seven were moderately correlated. The interesting finding here is four of these statements are about professors. It can be concluded that professors could play a role in online student engagement if their online presence and competence in delivering online courses are perceived high by the students. Table 6 demonstrates items that are correlated with the result of the online engagement scale.

Table 6. *Correlation between perception and engagement*

	OSE
Online courses are easier than traditional courses.	.446**
Students receive better quality teaching from online courses than they receive from traditional courses.	.311*
Students learn more in online courses than they learn in traditional courses.	.294*
Students who take online courses must be more disciplined in their studying than traditional courses.	.442**
Professors are more available to students in online courses than in traditional courses.	.406**
Professors give feedback to students quicker in online courses than in traditional courses.	.443**
Professors give better quality instruction in online courses than in traditional courses.	.318*
Professors like teaching online courses.	.308*

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

3.4. Academic achievement

Academic achievement is another concern about reactive online education. One would think that this unexpected and immediate switch to online education would possibly yield lower academic achievement. However, the result of the paired-samples t-test run to compare participants' GPA in the fall, and the spring semesters did not support this view. In contrast, the GPA average in the fall (M = 2.07, SD = .83) was significantly lower than that in the spring (M = 2.39, SD = 1.05) semester when reactive online education was provided; t(50) = -2.914, p = .005, with a small effect size (d = .40). Table 7 illustrates the results of the paired-samples t-test.

Table 7. *Paired-samples t-test result of fall and spring GPA*

	N	Mean	SD	*t*(50)	*p*	*d*
Fall GPA	51	2.07	.83	-2.914	.005	.40
Spring GPA	51	2.39	1.05			

3.5. Results of the qualitative analysis

When asked if they had a choice this semester, what they would have preferred all but two expressed that they would have preferred traditional face-to-face classes. They have reported a variety of factors for this strong preference. Upon examination of the qualitative data retrieved from the responses given to this and the other open-ended questions of the survey, five major categories were identified; contextual factors, pedagogical factors, psychological factors, social factors, skill/behavioral factors.

3.5.1. Contextual factors

Several themes appeared within the category of contextual factors, namely, technical difficulties, learning environment, saving time and money, and convenience. One of the most important factors that seemed to affect students' experience and thus influenced their attitude towards reactive online education was technical difficulties. The majority of the students expressed concern about technical issues. These related to internet connection problems, device failures such as a microphone, lack of equipment on the part of the students, power cuts, and network errors. Students expressed,

I was trying to connect with my smart-phone and teachers were want us to go another page then another one, it was causing my phone to freeze and I wasn't able to do some tasks. (P6)

During online lessons, mostly I couldn't hear my teachers voices I had to refresh the page all the time. (P17)

My internet connection was very slow so this was my challenge for this semester. (P26)

This seems to be the biggest issue related to reactive online education. As the students were unprepared for this education, so was the university. Since the university was offering only a handful of online courses, their servers and broadband connection were probably optimized for such small traffic. However, this unique situation moved all the courses online without exception and it possibly overloaded the system. Likewise, internet providers were not prepared for this increased traffic resulting from both online education and people's increased use of the internet during the curfew put into effect after the arrival of the virus in the northern part of the island. Thus, it was not as efficient as an online education should be because of such technical issues.

Another contextual factor that gleaned from students' responses was the learning environment. This was related to both the limitations resulting from the physical environment and affective factors such as the difficulty of focusing at home. Students sometimes had distractions while connecting from home and some other times they could not motivate to study. What follows are excerpts demonstrating this aspect:

There are other people in my house so I have to freeze everything when I am having an online lesson and it is not always possible. (P3)

I prefer traditionals because I feel I am a student but while taking an online lessons I don't feel this. I am more planned organized person while going to school. (P13)

The environment at school somehow directs to towards the classes but in the home environment you never want to study. (P43)

Three other factors, which were expressed as advantages of online education, mentioned by several students that are related to the learning environment were saving time, saving money, and convenience. Students felt that because they did not have to go to school, they could save some time and money. Moreover, students felt that connecting from home was convenient. Students said:

We save on traveling time. We can straight away connect to the lesson without having to travel to campus. (P3)

Also there is a decrease in educational costs. (P30)

The only strength of online learning is it's at your convenience. You can take part in lessons in your room. (P22)

3.5.2. Pedagogical factors

Another category that influenced students' opinions about online and traditional education was related to pedagogical factors. Overall, students found traditional education more efficient in learning content. This is demonstrated by the quotes below:

I prefer traditional courses because I can learn much better face-to-face. (P16)

Traditional because it is better for studying or learning something. (P29)

Traditional because I think it is more efficient. (P35)

Another subcategory related to learning in traditional education is active participation and interaction. Several students expressed concern related to this aspect. Some mentioned the ability to better communicate, and some others mentioned active participation in the lesson and yet others emphasized the interaction between the professor and the students and among the students themselves. The following excerpts illustrate these points:

I do better in traditional face-to-face cause I participate fully in the lessons. (P22)

Because I have to be eye contact with teacher when learning. (P25)

We could be more active, we could learn more effectively and when the teacher asked questions, we could hear and understand more easily. (P17)

Face-to-face because in the same environment we could have easier and better interaction in real time. (P32)

The relationship between the student and teacher allows more active participation in the face-to-face education process. (P32)

However, students also acknowledged that the online classes allowed replaying lessons to enhance learning and they contributed to learning by making students do more homework assignments than traditional courses. On the other hand, the number of homework assignments in online education was also a source of complaint about the workload.

Homework assignments consolidate learning (in online education). (P34)

The ability to listen to the lesson again. (P35)

Professors gave lots of homework to the students and it made the online education harder and harder. (P6)

3.5.3. Psychological factors

Psychological factors are those that students mentioned concerning their emotional state and their motivation. Students feel that they can socialize when they go to school and enjoy their time there and this has a positive effect on their psychological state and motivation. This is something students miss. This is evident in the following remarks:

There are a lot of things going on around us and because of the COVID-19, we all have to stay indoors and it is very overwhelming. (P3)

I can learn more when its face to face. I can improve more and have fun at school. (P19)

We socialize and stay positive psychologically. (P12)

Face-to-face education I miss school. (P34)

Psychologically feeling that I am not receiving education (in online learning). (P42)

I believe school environment motivates a student. (P42)

In traditional courses I am more motivated and this is why I am better. (P29)

Some remarks were also noted related to how difficult it can be to self-motivate and focus on the lesson in online education.

I feel unmotivated with online. (P25)

Of course traditional classrooms because online learning decreases motivation. (P2)

One student, on the other hand, expressed that online learning could be an advantage for students who are not comfortable in a social environment:

From another point of view, the disadvantage of the classroom environment for students with social phobia will turn into an advantage for them in terms of ease of learning in online education. (P30)

The students were also asked about factors that influence their motivation. They listed a handful of reasons from having no other choice to professors and classmates. One thing that was evident that the students felt that it was an obligation and that was the only driving force for them to handle this reactive online education. They expressed, for instance:

My motivation is knowing it is the only way I will get my education this semester. (P3)

My motivation was that I had to participate even if I'm not really happy with that. (P14)

To ensure I complete my program that I started before the pandemic. (P26)

I join lessons only obligation. (P25)

There was evidence of intrinsic motivation as well. Some students kept their desire to be successful, which motivated them during this process:

And also I wanted to be a successful. (P15)

What motivated me was my effort to improve myself. (P39)

Among other motivating factors mentioned were convenience, tasks, and professors/classmates as evident from the following excerpts.

Only motivation that I have while participating online lessons are restful and at home. (P25)

The subjects/ activities/tasks I love and understand have always motivated me to attend class. (P17)

My teachers and friends motivated me. (P15)

The most frequently mentioned demotivating factor, on the other hand, was technical issues such as computer failures and internet connection problems.

3.5.4. Social factors

The fourth thematic category, social factors, relates to students' feeling of cooperation and socializing. Students felt that during traditional face-to-face education, they could scaffold one another's learning. They also felt that the ability to socialize had a positive psychological effect

on them in traditional education. They expressed this as a positive aspect of traditional education and was a factor that contributes to their preference for traditional education over the online one. They commented:

I would definitely choose face to face courses because students motivate each other help each other in every situation. We socialize and stay positive psychologically. (P12)

I am more close to others students and teachers. (P14)

3.5.5. Skill / Behavioral factors

The last category identified was skill/behavioral factors, which involved professor (in)experience, lack of skills and skill development, lack of practice, and habit. Students generally regarded online education as poor in providing enough practical training. They also highlighted how teachers and students are not experienced and skilled enough in online education or technology. This is one aspect that is quite relevant in reactive online education which came in as a surprise for most of the professors and students. That is probably why they mentioned they are used to traditional education and it is difficult to change overnight. The following excerpts demonstrate these points.

I would prefer face to face education because almost all the teachers know exactly what to do and they have a plan but in online semester it doesn't efficient that much. (P6)

Face-to-face courses. The reason is that, I am more like traditional student. I am not good at technology. (P7)

For some lessons like history or more related to theory lessons can be taught also online I think but not practical or technical lessons. (P28)

The only think good is that I have improved my informatics notions and use better technology. (P14)

I am better in traditional education because I got used to it, it has been many years, people are getting traditional education, so the behaviors doesn't change in one night. (P26)

These results demonstrate that the students have a greater tendency towards face-to-face education and expressed several factors and they were quite varied caused by technology, learning environment, contribution to learning, socializing, psychological state, motivation, experience, and so on. Overall, the qualitative data provided insight into the perceptions and attitudes of the students towards reactive online education as opposed to traditional face-to-face education.

4. Discussion

The findings of the quantitative data show that students had overall negative perceptions of reactive online education but they were engaged with the courses and performed better academically in the period when online education was provided. Students disagreed with most positively-worded statements about online education. The qualitative data analysis, on the other hand, revealed several factors contributing to this negative perception. Students felt disconnected from their peers and teachers and they experienced technical difficulties. Roulston et al. (2018, p. 191) claim "If students experience technical difficulties, feel isolated, or perceive that the online course is less rigorous, a course will typically be perceived as less rewarding." The current study echoes this assertion because students mostly thought lower of online education as opposed to traditional face-to-face education. Among factors, technical difficulties seemed to be most influential as it was the most frequently mentioned issue in open-

ended questions. It is interesting to note that most of the research evaluating online education did not identify technical difficulties, possibly because, in normal circumstances, online education is offered with necessary infrastructure. However, when it is immediately offered in a catastrophic situation like the COVID-19 pandemic, institutions may not have the necessary infrastructure to efficiently provide online education, causing many technical issues and subsequent dissatisfaction by the students.

Another aspect that could explain students' overall negative perception is students' lack of experience with online education. Most of the students who participated in this study did not take any online courses previously. Astani et al. (2010) found that prior experience with online education is a factor in satisfaction with online courses. The more experience the students have with online education, the higher their satisfaction gets. Therefore, the overall lack of satisfaction with reactive online education may in part be due to a lack of prior experience with online education. If school closures continue and online education is further provided, the students are likely to report a higher level of satisfaction with online education. A relevant finding in another study is that the more time students spend on the Moodle LMS system, which is the one used in the context of the current study, their satisfaction level increases (Horvat, Dobrota, Krsmanovic & Cudanov, 2015). Although students have spent all their school time on LMS because of the nature of the education provided in this study, other factors such as technological issues possibly prevented them from enjoying the online experience.

Despite this negative perception, online student engagement was found to be high in this study. Dixson (2015) argues that the OSE can indicate teaching effectiveness albeit indirectly. Reactive online teaching may have been effective in this respect. When the comparison of students' GPA between the fall and the spring semester supports this notion because students' spring GPA turned out to be significantly higher than their fall GPA, a finding contrary to previous research that either found no difference or found that students performed better in face-to-face rather than online (e.g. Davidson, 2016; Johnson & Palmer, 2015; Kemp & Grieve, 2014). Thus, other factors than effective teaching need to be searched for to explain the dissatisfaction with reactive online education. However, it needs to be noted that students disagree with the statements like "Students receive better quality teaching from online courses than they receive from traditional courses; Professors give better quality instruction in online courses than in traditional courses." Students may be attributing their higher academic achievement in this semester to their own efforts rather than aspects of online teaching. Still, they acknowledged that the ability to replay lessons and an increased amount of assignments and tasks were factors facilitating their learning. All in all, technical issues in online education and a sense of disconnection from peers and professors triggered a negative attitude towards reactive online education, which may not mean that it was ineffective. On the other hand, this negative perception may have a lasting effect. Otter et al. (2013) state that students' perceptions will shape their future choices and actions. In this study, students demonstrated negative perceptions. One student said he did not take any online courses before and added "I am glad I did not take (any)." This shows that this negative perception of students may be strong enough to define their future views and decisions regarding online education.

The fact that students had high engagement could be explained by the online presence of the instructor and the communication between the students and the instructors and among students themselves. Dixson (2010, p. 8) contends that "when students readily identified multiple ways of interacting with other students as well as of communicating with instructors, they reported higher engagement in the course." In these courses, students were in contact with their instructors through several channels. They had synchronous online lessons, which allowed voice and chat communication with the instructor and other students. Besides, students were asked to contribute to discussion forums on the courses' learning management systems.

Students were also constantly in touch with the instructors and other students via email and a popular text-messaging app. However, the results also show that students reported that they felt disconnected from their instructors and other students despite the availability of several channels to communicate with the instructors and other students. This presents a paradoxical result, for students were both engaged and at the same time felt disconnected. Boling, Hough, Krinsky, Saleem, and Stevens (2012) identified that students' involvement does not necessarily result in positive and helpful experiences in online programs. This context of online education was also unique in that students suddenly had to isolate not only from the school but also from society at large because of the pandemic. This sudden physical isolation may have made them feel disconnected from their instructor and the students. Thus, the possibility that this experience could have been a traumatic one for some students has to be considered. Even in normal circumstances, Boling et al. (2012) found that disconnection was a major factor that hindered students' satisfaction with online courses. A similar notion was noted by Lee and McLoughlin (2010) as well.

To avoid such a risk of isolation, Dixson (2010) suggests that instructors who design online courses should include in their course design communication among students and between the students and the instructor as an integral part of the course. This is also a notion supported by Lee and McLoughlin (2010, p. 81) who believe that "both student-teacher and peer-to-peer interactions must be recognized as important factors if students are to value their studies and engage in satisfying experiences." They also suggest providing and increasing student self-direction, community building, individual support, and a sense of social and teacher presence. Eight out of twenty-one items of the perception survey in this study correlated with the results of the online engagement scale and four of those eight items were statements about professors, which highlights that professors are likely to play a significant role in student engagement levels. This is also a conclusion in Dixson's (2010) study where online presence is high in the course through multiple ways of interacting with the instructors and other students, engagement levels also increase.

The analysis of the qualitative data revealed that one of the factors that motivated students was tasks and activities. This is in line with Dixson's (2010) findings that students who reported activities that motivated them were more engaged with the course. It is apparent that meaningful tasks and activities could be a factor that could both motivate and engage learners. Thus, online course planners should carefully consider meaningful tasks and activities.

The results also revealed that students mentioned a number of advantages of both traditional face-to-face education and online education. However, they mentioned disadvantages only for online education although negative aspects could be inferred by contrasting with advantages listed for online education. Since the general focus of the open-ended questions was on reactive online education, it is understandable why they listed disadvantages only for online education even though there were questions addressing both forms of education (e.g. Do you think you do better in online courses or traditional face-to-face courses? Please explain why?). The positive aspects identified for traditional face-to-face education are educational environment, practical training, easier to focus, clarity, organization, motivation, access to instructors, cooperation, interaction/communication, active participation, teacher experience. The advantages of online education the students mentioned, on the other hand, are no distractors, convenience, saving time and money, quietness, equal opportunity, appropriate for asocial students, active learning through assignments/projects, ability to replay lessons, technical skill development. The negative aspects mentioned for online education are as follows: technical difficulties, lack of technical skills, environmental distractors, demotivating, workload, lack of clarity, lack of immediate feedback, disconnection, teacher/student inexperience, boring, physical issues like pain in eyes and head. Some of these overlap with previous research. For

example, Kemp and Grieve (2014) listed advantages for face-to-face as more engagement, immediate feedback, no wish to read comments, deeper understanding, better flow of argument, easier to review material and for online education as more convenient, wider contributions, more detailed responses, more time to think, faster to type, less judgment. One point to note here is that students in this study referred to clarity as an advantage of traditional face-to-face education and lack of clarity for online education. This is relevant to the notion of negotiation of meaning commonly cited in the field of applied linguistics, a theory which asserts that meaning is clarified and made comprehensible by interactive moves such as a request for clarification, comprehension checks, repetitions, etc. (Ellis, 1991). It seems that negotiation of meaning is not a strong feature of discourse in online education, leaving some of the content potentially unclear.

Results of the qualitative data also revealed that students think they help each other in their learning in face-to-face education, which they could not find in online learning. This is in line with the premises of sociocultural theory, which holds that when people work together, they co-construct opportunities to mentally develop and learn, from which expert knowledge arises (Lantolf, 2000, p. 18). Thus, from the point of view of sociocultural theory, face-to-face education is likely to be more effective because of the immediate availability of support from the instructors and peers although, from the constructivist point of view (Applefield, Huber & Moallem, 2000), online education may be stronger because students pointed out as they engage in assignments and projects, they become active and this effort consolidates their learning.

All in all, the findings of the study support the first hypothesis that the students have an overall negative attitude towards reactive online teaching. The second hypothesis, however, does not find support. There was no correlation between the majority of the general positively-stated items about online education in the perception survey and the online student engagement scale. Students' online engagement was not a function of their perception of online education. The third hypothesis also needs to be rejected as students achieved a higher GPA in the spring semester when reactive online education was provided than the fall semester when they received their education in the traditional face-to-face format.

5. Conclusion

The coronavirus pandemic has created a crisis that has influenced educational institutions drastically. The study investigated students' perception of and engagement in reactive online education in this time of crisis. The findings showed that although students did not handle it well affectively, they did well cognitively and in terms of their academic behavior. They were engaged with the courses and achieved higher grades during the pandemic than the semester before the pandemic. The results may give insights into course development in the future to achieve higher student engagement, positive attitude, and success. However, as Anderson (2008, p. 66) puts it, "The challenge for teachers and course developers working in an online learning context, therefore, is to construct a learning environment that is simultaneously learner-centered, content-centered, community-centered, and assessment-centered." When courses are not heavily text-based but involve interaction between students and between students and the instructors as well as a variety of multimedia, there is a chance that the students will appraise their experiences positively (Boling et al. 2012). If school closures continue, institutions could be better prepared for online education with the experience they gain in this semester to provide more efficient online education resulting in more positive student attitudes. In this respect, this study may contribute to knowledge development pertaining to the effectiveness of reactive online teaching and may also contribute to institutions' endeavors in the future while preparing for possible moments of crisis and

developing strategies to raise student motivation and engagement in such courses. Yet, the study has certain limitations. First, it did not implement random sampling and administered online in a single educational institution. Besides, psychological factors such as traumatic responses to a catastrophic event were not investigated or controlled for. Thus, further research may investigate how students' views and behaviors may have been shaped by their emotional response to a catastrophic event like the COVID-19 pandemic.

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