Perceptions of Business Students toward Online Education before and in Transition Period of COVID-19

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Abstract: - Covid-19 affects our lifestyles dramatically. It also affects the education styles. Spurred by the Covid-19 pandemic, most of the learning in a traditional classroom setting were transferred to online format. This study was designed to assess the students' perception on the traditional and online learning before Covid-19 pandemic and in transition to the Covid pandemic when all classroom learning is closed and transferred to online based learning. Students were sampled to obtain their general perceptions regarding traditional and online learning. The data were collected via an online survey during October/November 2019 and March/April 2020. Findings indicate that the perceptions of students changed negatively in transition period. A large majority of students agreed before Covid-19, but they disagreed in transition period on the following: online education increases learning levels; students learn more with online courses; zoom is much better than learning in the classroom environment; online courses are easier than traditional courses; I would recommend taking online courses instead of in class courses to a friend or colleague; and I would like to take my other courses in online form. The results show that a sudden change to the system will negatively impact the students and it did not allow time for students to adjust to the change. They are simply not ready to take all the courses online. However, students all agreed the use of technology in classroom increases their engagement and interest in the subject matter.

Key-Words: - Covid-19, Online education, traditional education, online learning.

1 Introduction

Online education has evolved over the years alongside with the emergence of technology. In the 1980s, when computers were expensive and not easily assessable, the use of technology is limited to computer labs in the education environment. A decade later, the computer technology has advanced and was widely adopted until in the 20th century educators in high schools, colleges and universities are starting to offer online courses with the aid of technologies. Bri et. al.(2009) described the usage of technologies to support the online learning platform [1]. The evolution of online education is well-chronicled [2]. The rapid growth of online education has inspired numerous research in this field to understand the adoption of online education and the impacts on students' learning. The online education not only affect students but also the instructors or teachers. However, this paper focuses on the students' perspective. This study examines changes in students' perception toward online learning before Covid-19 and the transition period of Covid-19. The World Health Organization (WHO) declared Covid-19 pandemic on March 11, 2020 [3]. Before Covid-

19, students have a choice to select either a traditional face-to-face course, a hybrid course or an online course to learn. In the transition period, the students who currently enrolled in the face-to-face course were suddenly switched to an asynchronous or synchronous online course taught with the aid of Zoom or Microsoft teams. Due to the abrupt transition to online learning, the study analyses the students' perception on online learning in order to understand their readiness to learn in a virtual space. During the Covid pandemic, the face-to-face classes were suspended and replaced with online learning. This study also examines the perception gap on online learning across students' gender, class standing, grades earned and online learning experience, which measured in terms of number of courses taken online.

The Covid pandemic has forced all learning in higher education from in-class to online platform. This initiation of online teaching not only happens in Canada but globally as well. The growth of online courses is inevitable moving forward and it has been expedited by the pandemic. Students and educators have to accept online learning style in post Covid

years which may be a new normal. Most importantly we want to understand the students' perception of taking all courses online rather than hybrid or face-to-face courses.

The paper is organized as follows: Section 2 reviews the relevance literature. Section 3 describes the research methodology. Section 4 discusses the research findings. Section 5 summarizes the findings, concludes the paper and highlight the future work.

2 Review of Literature

Technological innovations starting with early 1980s changed and provided both opportunities and challenges for everything in our life [4].   The developments in the communication and Internet technologies during the last three decades have had a major impact on education. The traditional face-to-face education has changed substantially with the addition of technology [5]. Many professional educators have modified their teaching styles to incorporate new technology into their courses [6]. One can list the computers and projection devices, wireless Internet access, the laptops, and smart phones that the students bring to class, and the "clickers" among the new technologies that were introduced into the classrooms [6-9]. In addition, many universities, including leading academic institutions, have started to teach online courses and/or offer online programs [6]. In the literature, one of the research articles divided the development of online education into four phases, 1990-2000, 2000-2007, 2007-2013 and 2013-present [2, 10]. In the first phase, (1990-2000), universities such as Penn State and University of Maryland College, adapted their established distance learning programs for online delivery.

In the second phase, (2000-2007), according to the Sloan Consortium, approximately 3.9 million students were enrolled in online courses in Fall 2007, more than double the number enrolled in Fall 2002 [2, 10, 11]. According to Babson Survey Research Group in the United States [12], for the sixth consecutive year the number of students taking at least one online course continued to expand at a rate far more than the growth of overall higher education enrollments [2, 4]. The popularity of online courses increased all over the world. For example, Chinese universities have launched online education reforms to form an open education network based on information and network technologies since the beginning of the 21st century. With the rapid development of Massive Open Online Courses, the number of these online courses offered by Chinese universities has exceeded 500, and nearly 3 million people have participated in these courses [13, 14]. As the forerunner of online education in Chinese universities, Peking University has offered about one hundred online courses [13]. The growth from 1.6 million students taking at least one online course in Fall 2002 to the 4.6 million for Fall 2008 represents a compound annual growth rate of 19 percent. The overall higher education student body has only grown at an annual rate of around 1.5 percent during this same period [4, 5]. The third phase (2008-2013), a new model of online education, named "Massive Open Online Courses" evolved with the aim of offering online education at a large scale with no or very little cost. Several online platforms, like Udacity, EdX emerged [2, 13]. The fourth phase (2013-present), enrolments continued to grow. According to the Babson Survey Research Report [10, 11] by Fall of 2013, one in every eight students enrolled in college and universities in U.S. was studying completely online, and one in every four students took at least one online course. Again, according to the Babson survey Research Group's latest report, by 2016, there were more than 6 million students in the U.S. enrolled in at least one distance education course, representing 31.6% of all students [10, 12]. For more than ten years since the first mass open online courses appeared developed by Dave Cormier, a professor at the University of Prince Edward (Canada), scientists from different countries have conducted research related to the application of this technology in education, focusing on the newly coined term Massive Open Online Courses (MOOCS) and "online learning" [15].

The advancement of technology brings us smart education which involves the provision of student-centered learning through interaction with learning materials using intelligent information systems, as well as the inclusion of non-formal learning opportunities and professional communities [16, 17]. From the technological point of view, smart education can be considered as technology enhanced learning. Technologies play a role in media or tools for accessing learning content [16, 18], communication and collaboration, construction, expression, and evaluation [16, 19]. The goal of the specialist involved in the e-learning systems is to improve the image of this new educational process. This requires the up grading of professional standards in online teaching systems [20]. Results from extensive literatures show that the primary objective of online learning is not only to improve the reach and access of education to the general mass, but also improve the quality of learning along with reducing the cost of education delivery [20-22]. Overall,

online learning can be beneficial for the students, as they can learn from anywhere and anytime and at their own pace. The perception of the students towards online learning is mostly positive, as evident from the existing works [21, 24-26]. Globally, the teaching-learning process is evolving rapidly from a traditional classroom environment to a mixture of traditional plus on-line learning. Cheap and widespread availability of devices such as smartphones and laptops, together with various applications like YouTube, Facebook, WhatsApp, etc. is changing the way people live, communicate with each other, and even their educational habits [21, 27]. For example, just like a physical classroom has got a specific schedule, using this application it is possible to take live online classes for multiple students at a pre-scheduled time. Moreover, if the course instructors want, they can even record their videos and upload those to the application for the students to view. Therefore, in essence this application works in a synchronous as well as an asynchronous delivery mode, depending upon the choice and preference of the students and the instructors [21].

The novel coronavirus disease 2019 (Covid-19) pandemic has affected almost every country on the globe, affecting 185 countries with more than 2.6 million cases and 182,000 deaths as of April 22, 2020 [28]. All education systems are affected by this pandemic, it has created a realization globally that no country is fully equipped with novel and innovative ways of learning. Around 1.7 billion learners are affected due to Covid-19 by temporally suspending their educational activities [29]. For example, the outbreak of Covid-19 was unexpected, and it forced Peking University to launch live online programs of a total of 2,613 undergraduate online courses and 1,824 graduate online courses to ensure the normal teaching operation, with 44,700 students stay at homes or dorms [13, 31]. Irrespective of these challenges, students perceive online learning as effective as face-to-face learning, enjoyable, able to learn at own pace, easy access to online material, and active participation. 82.9% of students agreed to integrate online learning into their course in the future and overall perception regarding online learning during Covid-19 is 79.7% [31]. Covid-19 is having profound impacts on tertiary education globally. Border closures, cuts to aviation capacity, mandatory quarantine on entering a country, restrictions on mass gatherings, and social distancing all pose challenges to higher education (HE) institutions [32]. The broader economic impacts of Covid-19 have led to significant numbers of students experiencing hardship, including international students that are stranded in their country of study throughout the pandemic [32]. Numerous studies in the field of educational technologies agree that the basis of online learning is a carefully designed and planned educational process supported by a methodically sound and focused sequence of educational, methodological and assessment materials that ensure the achievement of learning outcomes in an electronic format. A well-thought-out design of the course as an instrument of online course is absent in a sharp shift to the distance learning in the situation with Covid-19 in 2020 [15, 33]. There are over 45,000 medical students in the UK and ROI [15]. Approximately half of these students are completing formal anatomical education during the early years of their program. Therefore, alternative educational and assessment strategies will impact a large cohort of approximately 20,000 students with immediate effect [34]. In this situation, it would be unreasonable to use the term online learning even in relation to the use of MOOCS since the urgent transfer to them in the middle of the semester without any preliminary organizational measures does not allow students to fully feel the benefits of this technology [15].

Students often have problems such as lack of self-discipline, suitable learning materials, or good learning environments when they are self-isolated at home [13]. According to a research on learning from rapid solutions intra-Covid collaboration the Covid-19 pandemic has dramatically changed the landscape of medical education [35]. The need for rapidity necessitated compromise given that, as Eachempati and Ramnarayan suggest, emergency remote teaching is 'quite different' from 'meaningfully structured' online experiences [35, 36]. According to the research on students' perspectives on dental geriatric care, students' reflections highlighted the effects of the pandemic, not only on their education but also on frail older adults themselves and the profession of dentistry in general [37]. There are different negative effects of Covid-19. Use of technology (smart phones, laptops, tablets, etc.) to attend online classes is one of the main reasons for physical and psychological health problems. Unhealthy eating habits, sleep deprivation, immobile lifestyle by staying at home to slow the spread of virus may arise several common problems such as obesity, eyesight, anxiety, aggression, and behavioural issues among students [29].

Above given challenges for learners during this global crisis are negatively affecting the students to lead them toward proxy attendance and less interaction in class. Learners are also facing another emerging challenge that they are unable to complete

their given task to meet the deadline due to lack of individual gadgets and to seek the internet speed. This time-consuming process of learning will not let educators to complete their syllabi and make learning effective as well. To make learning effective major tools are good digital educational material, equivalence in digital equipment, and digital security. To replace the online classes with physical academic sessions during normal situation requires cost-effective students network packages, training, qualitative educational material, and availability of smartphones and laptops [29, 38].

Besides many disadvantages of Covid-19, online learning has several benefits such as easy accessibility, flexibility, increased convenience, relatively cheaper mode of education in terms of low cost of transportation, and accommodation [31, 39].

Over the decades the demand for online courses is growing rapidly. When the pandemic was declared and forced the universities globally to switch to online learning, universities are ready for this change but are the students ready to accept this drastic change. This paper examines and compares the students' perception and preferences before Covid-19 and in-transition into the pandemic period.

3 Research Objectives and Methodology

The main objective of this study was to investigate how undergraduate business students prefer online learning versus traditional learning before and in transition of pandemic, and students' perceptions on the used of education-related technology like Zoom, Google classroom, Microsoft Teams, Blackboard, Slack, etc. It was hypothesed that the students would select online learning before Covid-19 and in transition period, because the new millennials or Generation Y, are heavy users of technology in their daily life. It is not surprising that the new millennials have the technical skills to succeed in online learning and therefore they are more likely to accept the online learning.

The survey instrument was designed around three main categories. These included:

- Preferences of online and traditional learning.
- Use of online platform, D2L, in learning.
- Perception of technology use in learning.

Another aim of this work was on how the perceptions changed from before Covid-19 to in transition period based on their grades, class standing, gender and number of online courses taken in the past. For this study, an online survey method was used to gather the data. As stated above, the questionnaire contains three main categories of questions including some classification questions. The data collection took place in October/November 2019 and March/April 2020 at a Canadian university in Ontario and a total of 93 and 33 responses were obtained, respectively. The month of October/November 2019 is perioded as before Covid-19 whereas the month of March/April 2020 is termed as transition period. The respondents were undergraduate business students. 29 (31.2%) of the respondents were males and 64 (68.8%) females before Covid-19 and 20 (60.6%) of the respondents were females and 13 (39.4%) of them were males. 56 (44.4%) of the respondents passed with grade A (includes A+, A and A-), 38 (30.2%) with grade B (includes B+, B and B-), 25 (19.8%) with grade C (includes C+, C and C-), 3 (2.4%) with grade D (includes D+, D and D-) and 4 (3.2%) of them failed with grade F. 16 (12.7) of the responders were 1st year students, 73 (57.9%) were 2nd year, 24 (19.1%) were 3rd year and 13 (10.3%) were 4th year students. Out of 126 respondents, 48 (38.1%) took one online course in the past (or currently taking), 31 (24.6%) took 2 online courses, 17 (13.5%) took 3 online courses, 9 (7.1%) took 4 online courses, 4 (3.2%) took 5 online courses and 17 (13.5%) took more than 5 online courses.

4 Research Findings and Discussion

In this study, a survey was designed with 27 items, some of which were obtained from an old study, (Ruzgar, 2015). The questions were pre-tested with 20 students, and some adjustments made on the questions. The Cronbach alpha reliability coefficient of the items in the survey was found to be 0.827 ($p<0.005$), which indicated that the instrument used was reliable.

4.1 Preferences of Online and Traditional Learning

There were 10 items in the survey related to the students' preferences on online and traditional education and learning before Covid-19 and in transition period. For the item, "I believed that online education increases learning levels", 66.6% of the 1st year students agreed, 33.4% were neutral and 0% of them did not agree before Covid-19 while 50% of them agreed and 50% of them did not agree in transition period. However, 2nd year students, 1.6% disagreed, 15.9% neural and 82.6 % agreed before Covid-19 while 30% of them disagreed, 20% neutral and 50% of them agreed in transition period. From the 3rd year students, while 8.3% were neutral and

91.6% agreed before Covid-19, 50% of them disagreed, 33.3% neutral and only 16.6% of them agreed in transition period. For the 4th year students, while 16.7% of them were neutral and 83.4% of them agreed before Covid-19, 100% of them agreed in transition period. Hence, this shows that student's preferences change according to their class standings (Fig. 1: A2). A five-point Likert Scale was applied to the statements in this section. For discussion purpose, "strongly agree" and "agree" categories were combined. Similarly, "strongly disagree" and "disagree" scales were combined. This combined scale will be the mode of discussion for the rest of the paper.
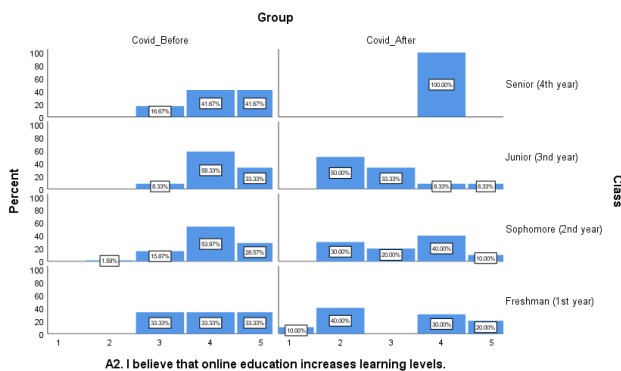
Fig. 1 Students' preferences for the online education increases learning levels according to their class standings (%)

The students showed the similar trend of preferences for learning more with online courses. 16.7% of the 1st year students disagreed and 66.7% agreed before Covid-19 whereas 50% were disagreed and 30% were agree in transition period (Table 1: A.4). 27% of 2nd year students were disagreed and 39.7% were agreed before Covid-19, but 50% were disagreed and 50% were agreed in transition period. For the 3rd year students, while 50% were agreed and 0% were disagreed before Covid-19, 50% of them disagreed and only 8.3% of them were agreed in transition period. However, the agreement percentages changed from 33.3% to 0% and disagreement percentages changed from 50% to 0% before Covid-19 and in transition period (Table 1: A9). The same percent changes were seen on the item "students learn more with online courses". While most of them, 66.7% of 1st year students, 54% of 2nd year students, 83.3% of 3rd year students and 58.3% of 4th year students, supporting that the students learn more with online courses before Covid-19, during the transition period, their opinions were negatively changed according to their class standing, 40%, 50%, 41.6% and 100%, respectively (Table 1: A17).

Table 1 Students' online and traditional learning preferences according to their class standings before Covid-19 and in transition period (%)

Class (%)		1st year		2nd year		3rd year		4th year		χ² *	
		CB (n=6)	CA (n=10)	CB (n=63)	CA (n=10)	CB (n=12)	CA (n=12)	CB (n=12)	CA (n=1)	CB (T=93)	CA (T=33)
A2	SD+D	0	50	1.6	30	0	50	0	0	0.946	0.466
	N	33.3	0	15.9	20	8.3	33.3	16.7	0		
	A+SA	66.6	50	82.6	50	91.6	16.6	83.4	100		
A3	SD+D	16.7	0	15.9	10	8.3	8.3	16.7	0	0.992	0.575
	N	16.7	20	28.6	20	25	33.3	16.7	0		
	A+SA	66.7	80	55.5	70	66.6	58.3	66.6	100		
A4	SD+D	16.7	50	27	50	0	50	50	0	0.369	0.495
	N	16.7	20	33.3	10	50	41.7	16.7	100		
	A+SA	66.7	30	39.7	40	50	8.3	33.3	0		
A9	SD+D	0	30	11.1	10	0	16.7	8.3	0	0.580	0.556
	N	50	10	12.7	40	41.7	16.7	25	0		
	A+SA	50	60	76.2	50	58.3	66.6	66.7	100		
A15	SD+D	16.7	30	15.9	30	8.3	58.4	25	0	0.305	0.400
	N	0	10	42.9	30	25	16.7	41.7	100		
	A+SA	83.4	60	41.3	40	66.6	25	33.3	0		
A16	SD+D	0	20	15.9	40	0	0	33.3	0	0.418	0.042
	N	33.3	10	20.6	30	16.7	0	41.7	0		
	A+SA	66.7	70	63.5	30	83.4	100	25	100		
A17	SD+D	16.7	30	22.2	30	8.3	41.7	8.3	0	0.529	0.844
	N	16.7	30	23.8	20	8.3	16.7	33.3	0		
	A+SA	66.7	40	54	50	83.3	41.6	58.3	100		
A18	SD+D	33.3	30	36.5	10	25	0	25	0	0.788	0.444
	N	33.3	40	41.3	40	41.7	50	58.3	0		
	A+SA	33.3	30	22.3	50	33.3	50	16.6	100		
A19	SD+D	16.7	30	34.9	30	25	16.6	25	0	0.569	0.954
	N	0	30	30.2	20	33.3	33.3	25	100		
	A+SA	83.3	40	35	50	41.6	50	50	0		
A20	SD+D	0	0	9.6	20	0	8.3	0	0	0.887	0.868
	N	16.7	30	15.9	30	25	16.7	25	0		
	A+SA	83.3	70	74.6	50	75	75	75	100		

* Asymptotic Significance (2-sided); CB: Covid Before, CA: Covid After,
SD:Strongly Disagree, D: Disagree, N: Neutral, A: Agree, SA: Strongly Agree

Results showed that the percentage of students' opinions on "learning more with online education" decreased from before Covid-19 to in transition period. However, the percentage of students' opinion on learning more from traditional education" increased from before Covid-19 to in transition period. Therefore, it seemed that the students prefer to go back to in-class learning rather than online learning during the in-transition period.

It is found that the percentages of students' positive opinions on the item, "traditional education increases learning level", increased from before Covid-19 to in transition period, 66.7% to 80%, 55.5% to 70% and 66.6% to 100% for the 1st, 2nd, and 4th year students, respectively, interestingly the percentage decreased from 66.6% to 58.3% for the 3rd year students (Table 1: A3). When traditional learning and online learning are compared according to the class standings before Covid-19 and in transition period, students displayed different preferences, the agreement level on the statement "students who take online courses will not learn

the material as well due to the lack of personal interaction with the professor and the peers" for the 1st year students decreased from 83.3% to 40%, for the 2nd year students increased from 35% to 50%, for the 3rd year students increased from 41.6% to 50% and for the 4th year students decreased from 50% to 0% and all of them neutral after Covid-19 (Table 1: A19). When the easiness of learning by online versus traditional courses was compared according to class standing before Covid-19 and in transition period, all students agreed that online education and learning are easier than the traditional learning before Covid-19, but they disagreed in transition period (Table 1: A15, A18). This agreement levels were the same for face-to-face interactions with professors and peers in a classroom environment among each other in online and traditional education and learning. Their agreement levels on the statement "Interaction with other students in a classroom environment is easier than in an online environment" according to class standing from before Covid-19 to in transition period, increased 50% to 60%, 58.3% to 66.6% and 66.7% to 100% for the 1st, 3rd and 4th year students, but interestingly decreased from 76.2% to 50% for the 2nd year students (Table 1: A9).
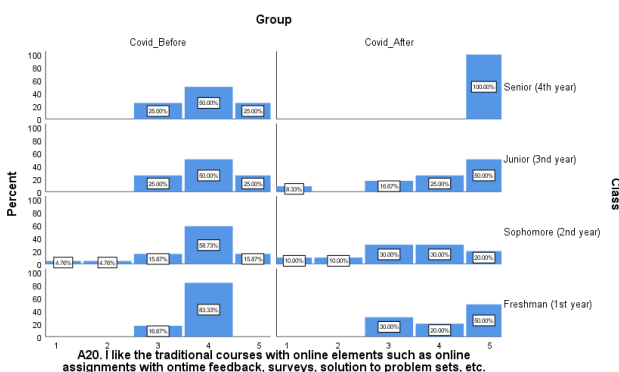

Fig. 2 Students' preferences on the in-class courses with online elements according to class standing (%)

Fig. 2 displays the students' preferences on traditional courses supported with online elements such as online assignments with on time feedback, surveys, solution to problem sets, etc. While 83.3% of the 1st year students agreed before Covid-19, only 70% agreed in transition period, 74.6% of the 2nd year students agreed before Covid-19, only 50% of them agreed in transition period. The agreement percentage, 75%, did not changed for the 3rd year students, it changed from 75% to 100% for the 4th year students from before Covid-19 to in transition period (Table 1: A20).

Table 2 Recommending and taking other online course preferences according to their class standings (%)

Class (%)		1st year CB (n=6)	1st year CA (n=10)	2nd year CB (n=63)	2nd year CA (n=10)	3rd year CB (n=12)	3rd year CA (n=12)	4th year CB (n=12)	4th year CA (n=1)	χ^2 * CB (T=93)	χ^2 * CA (T=33)
C1	Definitely would not	16.7	20	6.3	0	0	8.3	8.3	0	0.733	0.02
	Probably would not	0	0	14.3	50	16.7	0	33.3	0		
	Neutral	0	30	0	0	0	58.3	0	0		
	Probably would	66.7	20	58.7	20	66.7	16.7	41.7	100		
	Definitely would	16.7	30	20.6	30	16.7	16.7	16.7	0		
C2	Definitely would not	0	30	3.2	0	0	16.7	8.3	0	0.152	0.632
	Probably would not	16.7	10	9.5	40	0	41.7	33.3	0		
	Neutral	0	10	0	20	0	16.7	0	0		
	Probably would	83.3	20	63.5	20	58.3	8.3	50	0		
	Definitely would	0	30	23.8	20	41.7	16.7	8.3	100		

* Asymptotic Significance (2-sided); CB: Covid Before, CA: Covid After

Students' preferences on recommending the other students to take online courses instead of in class courses are changed according to class standings. While 66.7% of the 1st year students said probably would and 16.7% said definitely would before Covid-19, only 20% said probably would and 30% said definitely would in transition period. Likewise, 58.7% of the 2nd year students said probably would and 20.6% said definitely would before Covid-19, only 20% said probably would and 30% said definitely would in transition period and 66.7% of the 3rd year students said probably would and 16.7% said definitely would before Covid-19, only 16.7% said probably would and 16.7% said definitely would in transition period. However, while 41.7% of the 4th year students said probably would and 16.7% said definitely would before Covid-19, 100% said probably would in transition period (Table 2: C1).

When the independency of class standing and each item components before Covid-19 and in transition period was tested by using Chi-square test with the hypotheses:

Ho: Item components are independent of class standing

versus

H1: Item components are dependent on class standing

At the level of significance 5%, it was found that all p values were greater than 0.05, hence the item components were independent of class standing (Table 1, Table 2).

There is no evidence that the students' preferences are dependent on the class standing before Covid-19 and in transition period. Next, gender is tested whether it is related to students' preferences between the two periods.

Table 3 depicts the percentages of students' preferences before Covid-19 and in transition period according to the gender. While 79.7% of males and 89.6% of females agreed that online education increases learning levels before Covid-19, the percentages dramatically decreased to 45% for males

and 30.8% for females in transition period (Table 3: A2) Similarly, 40.6% of males, and 44.8% of females agreed that the students learn more with online courses before Covid-19, 30% of males and 15.4% of the females agreed in transition period. These percentage changes indicate that there is an agreement difference between the male and female students (Fig. 3, Table 3: A4).
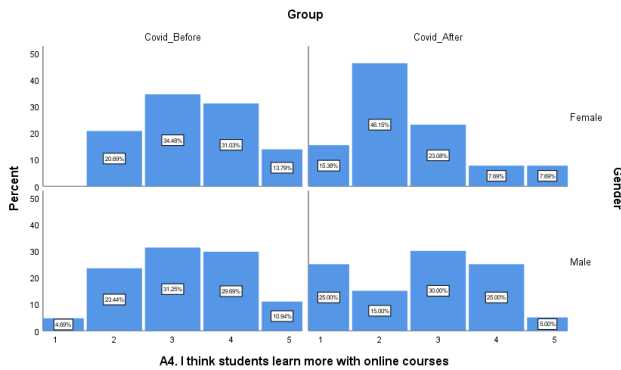

Fig. 3 Students' preferences for the online education increases learning levels according to their gender

However, there is a small difference for which the knowledge gained from an online course is equivalent to knowledge gained from a traditional course between male and female students. 61% of males and 55.1% of females agreed before the Covid-19, but 55% of males and 30.8% of females agreed in transition period (Table 3: A17). There was a positive change of agreement percentages of male and female student responses about the traditional education increases learning level from before Covid-19 to in transition period, the percentages of males increased from 60.9% to 75%, and females increased from 55.2% to 61.6% (Table 3: A3). However, the student's agreements on the item "the students who take online courses will not learn the material" were different according to gender before Covid-19 and in transition period. Agreement percentage was increased from 37.6% to 45% for the male students, but it was decreased from 48.2% to 46.2% for the female students (Table 3: A19). 68.7% of male students agreed the face-to-face interactions with professors and peers in a classroom environment before Covid-19, but this agreement reduced to 60% in transition period, similar situation viewed for the female students, it reduced from 75.9% to 61.6%. Although the percentages reduced from before Covid-19 to in transition period, their agreement levels were very high (Table 3: A9).

Table 3 Students' online and traditional learning preferences according to gender (%)

Gender (%)		MALE		FEMALE		χ² *	
		CB (n=64)	CA (n=20)	CB (n=29)	CA (n=13)	CB (T=93)	CA (T=33)
A2	SD+D	1.6	40	0	46.2		
	N	18.8	15	10.3	23.1	0.631	0.797
	A+SA	79.7	45	89.6	30.8		
A3	SD+D	17.2	0	10.3	15.4		
	N	21.9	25	34.5	23.1	0.497	0.485
	A+SA	60.9	75	55.2	61.6		
A4	SD+D	28.1	40	20.7	61.6		
	N	31.3	30	34.5	23.1	0.802	0.322
	A+SA	40.6	30	44.8	15.4		
A9	SD+D	11	20	3.4	15.4		
	N	20.3	20	20.7	23.1	0.601	0.339
	A+SA	68.7	60	75.9	61.6		
A15	SD+D	14.1	35	20.7	46.2		
	N	39.1	15	34.5	30.8	0.082	0.239
	A+SA	46.9	50	44.8	23.1		
A16	SD+D	17.2	20	10.3	15.4		
	N	23.4	15	24.1	7.7	0.477	0.73
	A+SA	59.4	65	65.5	77		
A17	SD+D	17.2	25	20.6	46.2		
	N	21.9	20	24.1	23.1	0.911	0.68
	A+SA	61	55	55.1	30.8		
A18	SD+D	34.4	15	31	7.7		
	N	42.2	40	44.8	46.2	0.716	0.565
	A+SA	23.5	45	24.1	46.2		
A19	SD+D	34.3	30	24.1	15.4		
	N	28.1	25	27.6	38.5	0.436	0.658
	A+SA	37.6	45	48.3	46.2		
A20	SD+D	9.4	10	0	7.7		
	N	17.2	30	20.7	15.4	0.472	0.716
	A+SA	73.5	60	79.3	76.9		

* Asymptotic Significance (2-sided); CB: Covid Before,
CA: Covid After SD:Strongly Disagree, D: Disagree,
N: Neutral, A: Agree, SA: Strongly Agree

When the gender differences compared for easiness of the online courses versus traditional (in class) courses, agreement percentage of male students increased from 46.9% to 50%, but interestingly the agreement percentages reduced from 44.8% to 23.1% for the female students before Covid-19 to in transition period (Table 3: A15). Both male and female students showed the same agreement percentage changes before and in transition period for the online classes being harder and more challenging than the traditional classes. The agreement percentage increased from 23.5% to 45% for the male students and from 24.1% to 46.2% for the female students before Covid-19 to in transition period (Table 3: A18). The agreement levels were the same for face-to-face interactions with professors and peers in a classroom environment among each other before Covid-19 and in transition period. Their agreement levels on the statement "Interaction with other students in a classroom environment is easier than in an online environment" according to gender differences before Covid-19 and in transition period, increased from 59.4% to 65% for the male students and from 65.4% to77% for the female students (Table 3: A16).
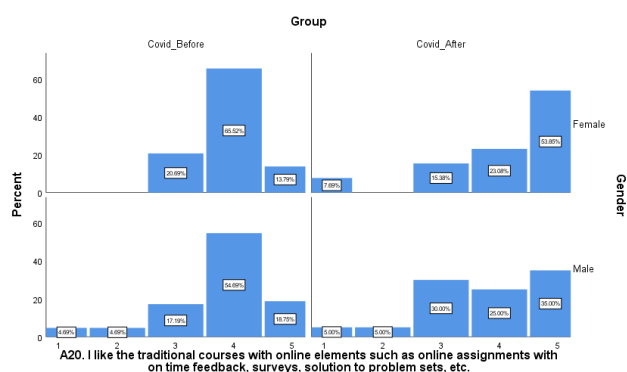
Fig. 4 Students' preferences on the in-class courses with online elements according to gender (%)

Fig. 4 shows the students' preferences on traditional courses supported with online elements. While 73.5% of the male students agreed before Covid-19, only 60% agreed in transition period, 79.3% of the female students agreed before Covid-19, 76.9% of them agreed in transition period (Table 3: A20).

Table 4 Students' recommending and taking other online course preferences according to gender (%)

| Gender (%) | | MALE | | FEMALE | | χ^2 * | |
		CB (n=64)	CA (n=20)	CB (n=29)	CA (n=13)	CB (T=93)	CA (T=33)
C1	Definitely would not	7.8	10	3.4	7.7	0.745	0.377
	Probably would not	17.2	5	13.8	30.8		
	Neutral	0	35	0	23.1		
	Probably would	54.7	25	65.5	15.4		
	Definitely would	20.3	25	17.2	23.1		
C2	Definitely would not	4.7	10	0	23.1	0.56	0.185
	Probably would not	10.9	25	13.8	38.5		
	Neutral	0	10	0	23.1		
	Probably would	64.1	25	58.6	0		
	Definitely would	20.3	30	27.6	15.4		

* Asymptotic Significance (2-sided); CB: Covid Before, CA: Covid After

Students' preferences on recommending taking online courses instead of in class courses are changed according to gender in transition period. While 54.7% of the male students said probably would and 20.3% said definitely would before Covid-19, only 25% said probably would and 25% said definitely would in transition period. Similarly, 65.5% of the female students said probably would and 17.2% said definitely would before Covid-19, only 15.4% said probably would and 23.1% said definitely would in transition period (Table 4: C1). Similarly, 64.1% of the male students said probably would take other online courses and 20.3% said definitely would before Covid-19, only 25% said probably would and 30% said definitely would in transition period and 58.6% of the female students said probably would and 27.6% said definitely would before Covid-19, 0% said probably would and 15.4% said definitely

would in transition period. Although there was no big difference between the male and female students about recommending or taking other online courses before Covid-19 and in transition period, agreement percentages of dramatically decreased in transition period (Table 4: C2).

When the independency of gender and each item components before Covid-19 and in transition period was tested by using Chi-square test with the hypotheses:

Ho: Item components are independent of Gender versus

H$_1$: Item components are related to gender

At the level of significance 5%, it was found that all p values were greater than 0.05, hence item components were independent of gender (Table 3, Table 4).

4.2 Use of online platform, D2L, in learning

Today, universities use different learning management systems such as Blackboard, D2L, Moodle, Canvas and so on to host their learning materials whether the courses are offered in class or online. After Covid-19 occurred, universities switched their in-class learning to online learning, generally they used the same learning management system to deliver the courses online. Instructors used the features of the system to deliver their courses, such as, modules, assignments, communication tools and assessments. In this study, the survey was posted on D2L and data were collected via D2L. Some of the items on the survey were related to D2L, i.e., how D2L affects learning, it is an efficient tool to learn, some were related to features of D2L.

The participant students had different thoughts about how the practice questions on D2L helped them to learn the subject matters that were more challenging to them. While the agreement level of the 1st year students increased from 50% to 60% before the Covid-19 and in transition period, it decreased for the 2nd year students from 85.7% to 70%, it remained the same for the 3rd year students, and it increased from 50% to 100% for the 4th year students (Table 5: A1). The reason for this difference is the great majority of students are the 2nd year students and there was only one 4th year student in transition period. The 4th year students' thoughts cannot reflect the general thoughts of the 4th year students. The number of participants should be increased. From now on, the 4th year students will not be discussed.

Table 5 Student perceptions on D2L features according to class standing (%)

Class (%)		1st year		2nd year		3rd year		4th year		χ² *	
		CB (n=6)	CA (n=10)	CB (n=63)	CA (n=10)	CB (n=12)	CA (n=12)	CB (n=12)	CA (n=1)	CB (T=93)	CA (T=33)
A1	SD+D	33.4	10	6.4	10	0	0	16.7	0	0.032	0.793
	N	16.7	30	7.9	20	16.7	16.7	33.3	0		
	A+SA	50	60	85.7	70	83.3	83.3	50	100		
A10	SD+D	16.7	20	6.4	10	0	0	25	0	0.152	0.567
	N	33.3	30	9.5	30	16.7	8.3	33.3	0		
	A+SA	50	50	84.2	60	83.3	91.7	41.7	100		
A11	SD+D	0	30	12.7	20	0	8.3	25	0	0.244	0.732
	N	16.7	40	39.7	50	25	58.3	50	0		
	A+SA	83.4	30	47.6	30	75	33.3	25	100		

* Asymptotic Significance (2-sided); CB: Covid Before, CA: Covid After,
SD: Strongly Disagree, D: Disagree, N: Neutral, A: Agree, SA: Strongly Agree

Some differences were seen on the statement "The use of modules in the D2L improves the learning process" for before Covid-19 and in transition period comparison. The agreement level of the 1st year students remained same, it decreased from 84.2% to 60% for the 2nd year students, increased from 83.3% to 91.7% for the 3rd year students (Table 5: A10). The agreement levels of 1st, 2nd and 3rd year students on how they liked to participate the class discussion board in D2L decreased from 83.4% to 30%, 47.6% to 30% and 75% to 33.3%, respectively before Covid-19 and in transition period (Table 5: A11).

Table 6 Student perceptions about D2L according to class standing (%)

Class (%)		1st year		2nd year		3rd year		4th year		χ² *	
		CB (n=6)	CA (n=10)	CB (n=63)	CA (n=10)	CB (n=12)	CA (n=12)	CB (n=12)	CA (n=1)	CB (T=93)	CA (T=33)
B1	SD+D	0	10	4.8	10	0	8.3	0	0	0.913	0.335
	N	16.7	0	17.5	10	8.3	16.7	25	0		
	A+SA	83.4	90	77.8	80	91.7	75	75	100		
B2	SD+D	33.3	20	28.6	10	25	8.3	25	0	0.311	0.904
	N	0	0	25.4	20	16.7	8.3	25	0		
	A+SA	66.7	80	46.1	70	58.4	83.4	50	100		
B3	SD+D	16.7	10	9.5	10	0	0	16.7	0	0.135	0.765
	N	16.7	20	17.5	30	16.7	33.3	41.7	0		
	A+SA	66.7	70	73	60	83.3	66.7	41.6	100		
E1	Minor inconvenience	0	20	27	20	25	33.3	50	0		
	Slowed my ability to complete homework	33.3	10	22.2	10	8.3	8.3	8.3	0		
	I was unable to complete my homework in a timely manner	33.3	0	9.5	0	33.3	16.7	16.7	0	0.281	0.527
	No influence on my homework	33.3	30	22.2	30	25	0	16.7	100		
	No problems at all	0	40	19	40	8.3	41.7	8.3	0		
E2	Very easy	0	0	9.5	10	0	0	0	0		
	Easy	50	0	38.1	0	25	8.3	33.3	0		
	Neither easy nor difficult	50	90	41.3	90	41.7	83.3	58.3	100	0.556	0.823
	Difficult	0	10	9.5	0	33.3	8.3	8.3	0		
	Very difficult	0	0	1.6	0	0	0	0	0		

* Asymptotic Significance (2-sided); CB: Covid Before, CA: Covid After
SD: Strongly Disagree, D: Disagree, N: Neutral, A: Agree, SA: Strongly Agree

A large majority of the 1st 2nd and 3rd year students agreed on easiness, reliability, and effectiveness of D2L as a good tool for learning before Covid-19 compared to in transition period (Table 6: B1, B2 and B3). Most of the 1st, 2nd and 3rd year students believed that experiencing errors or bugs in the D2L system did not have any influence on their homework and they were not a problem for them similar to the transition period (Table 6: E1). Most of the 1st, 2nd and 3rd year students neither agreed nor disagreed on how the "Assignment" modules helped them to learn

the subject matter before Covid-19 and in transition period in similar ways (Table 6: E2).

Table 7 Students perceptions on D2L features according to gender (%)

Gender (%)		MALE		FEMALE		χ² *	
		CB (n=64)	CA (n=20)	CB (n=29)	CA (n=13)	CB (T=93)	CA (T=33)
A1	SD+D	10.9	0	3.4	15.4		
	N	14.1	20	10.3	23.1	0.547	0.313
	A+SA	75	80	86.2	61.6		
A10	SD+D	9.4	10	6.9	7.7		
	N	17.2	25	10.3	15.4	0.451	0.864
	A+SA	73.5	65	82.7	77		
A11	SD+D	12.5	20	10.3	15.4		
	N	40.6	45	31	53.8	0.111	0.96
	A+SA	46.9	35	58.6	30.8		

* Asymptotic Significance (2-sided); CB: Covid Before, CA: Covid After, SD: Strongly Disagree, D: Disagree, N: Neutral, A: Agree, SA: Strongly Agree

Most of students agreed before Covid-19 and in transition period on how the practice questions on D2L helped them to learn the topics that were more challenging to them. Male students' agreement level increased from 75% to 80%, however female students' agreement level decreased from 86.2% to 61.6% in transition period (Table 7: A1). Likewise, majority of students agreed on using of modules in the D2L improved the learning process. Agreement levels of male and female students changed from 73.5% to 65% and 82.7% to 77% before Covid-19 and in transition period, respectively (Table 7: A10). The agreement levels of male and female students on how they liked to participate the class discussion board in D2L decreased from 46.9% to 35% and 58.6% to 30.8%, respectively in transition period. About discussion board in the D2L, neither agree nor disagree level of both male and female students increased in transition period. There was a small increase for male students, from 40.6% to 45.0%, when compared with the female students 31.0% to 53.8% (Table 7: A11).

Both male and female students agreed on easiness, reliability, and effectiveness of D2L as a good tool for learning before Covid-19 and in transition period (Table 8: B1, B2 and B3). The only agreement level difference was seen on the effectiveness of D2L as a good learning tool before Covid-19 and in transition period. It increased from 64.1% to 70% for the male students, however it decreased from 82.7% to 61.6% for the female students (Table 8: B3). About one third of the male and female students believed that experiencing errors or bugs in the D2L system did not have any influence on their homework and they were not a problem for them before Covid-19, it increased 55% for the males and 69.3% for the female students in transition period (Table 8: E1). Most of the male

and female students neither agreed nor disagreed on how the "Assignment" modules helped them to learn the subject matter before Covid-19 and this level was increased to 80% for the male students and 100% for the female students in the transition period (Table 8: E2).

Table 8 Student perceptions about D2L according gender (%)

Gender (%)		MALE		FEMALE		χ^2 *	
		CB (n=64)	CA (n=20)	CB (n=29)	CA (n=13)	CB (T=93)	CA (T=33)
B1	SD+D	4.7	5	0	15.4	0.762	0.222
	N	17.2	5	17.2	15.4		
	A+SA	78.1	90	82.7	69.3		
B2	SD+D	29.7	15	24.1	7.7	0.957	0.561
	N	21.9	5	24.1	15.4		
	A+SA	48.4	80	51.7	77		
B3	SD+D	12.6	5	3.4	7.7	0.39	0.536
	N	23.4	25	13.8	30.8		
	A+SA	64.1	70	82.7	61.6		
E1	Minor inconvenience	31.3	30	20.7	15.4	0.823	0.891
	Slowed my ability to complete homework	17.2	10	24.1	7.7		
	I was unable to complete my homework in a timely manner	14.1	5	17.2	7.7		
	No influence on my homework	21.9	20	24.1	23.1		
	No problems at all	15.6	35	13.8	46.2		
E2	Very easy	9.4	5	0	0	0.23	0.398
	Easy	37.5	5	34.5	0		
	Neither easy nor difficult	40.6	80	51.7	100		
	Difficult	12.5	10	10.3	0		
	Very difficult	0	0	3.4	0		

* Asymptotic Significance (2-sided); CB: Covid Before, CA: Covid After
SD:Strongly Disagree, D: Disagree, N: Neutral, A: Agree, SA: Strongly Agree

When the independency of gender and each item components before Covid-19 and in transition period was tested by using Chi-square test with the hypotheses:
Ho: Item components are independent of Gender
 versus
H1: Item components are related to gender
At the level of significance 5%, it was found that all p values were greater than 0.05, hence item components were independent of gender (Table 7, Table 8).

4.3 Technology use in learning
Since students are heavy user of technology products in their daily life, it is not surprising that they have some expectations of technology used in the classrooms (Table 9) [4, 5]. During the recent years, for smart classrooms equipped with internet access and computers, online learning platforms have become a prime source of learning. About 80% of students agreed that classrooms with internet access enrich their learning both before Covid-19 and in transition period in different class levels. However,

there was a class standing differences before Covid-19 and in transition period on the item "the use of technology in the classroom increases my engagement and interest in the subject matter." While 83.4% of the 1st year students agreed before Covid-19, it decreased to 80% in transition period. It decreased for the 2nd and 3rd year students, from 68.3% to 60%, and 91.7% to 50%, respectively. 50% of the 3rd year students were neither agreed nor disagreed (Table 9: A7).

Table 9 Perceptions on technology use according to class standing (%)

Class (%)		1st year		2nd year		3rd year		4th year		χ^2 *	
		CB (n=6)	CA (n=10)	CB (n=63)	CA (n=10)	CB (n=12)	CA (n=12)	CB (n=12)	CA (n=1)	CB (T=93)	CA (T=33)
A5	SD+D	0	20	1.6	10	0	16.6	8.3	0	0.255	0.990
	N	33.3	0	15.9	10	0	16.7	16.7	0		
	A+SA	66.7	80	82.5	80	100	66.7	75	100		
A6	SD+D	0	0	3.2	10	0	0	0	0	0.309	0.718
	N	0	0	6.3	0	0	8.3	8.3	0		
	A+SA	100	100	90.5	90	100	91.7	91.7	100		
A7	SD+D	16.7	10	9.5	10	0	0	25	0	0.307	0.439
	N	0	10	22.2	30	8.3	50	33.3	0		
	A+SA	83.4	80	68.3	60	91.7	50	41.7	100		
A8	SD+D	16.7	50	30.1	30	25	41.7	41.6	0	0.228	0.922
	N	66.7	20	22.2	30	25	25	33.3	100		
	A+SA	16.7	30	47.6	40	50	33.4	25	0		
A12	SD+D	0	80	31.7	40	0	50	16.7	0	0.242	0.217
	N	50	10	25.4	30	16.7	25	41.7	0		
	A+SA	50	10	42.9	30	83.4	25	41.6	100		
A13	SD+D	0	20	11.1	40	8.3	33.4	41.6	0	0.145	0.726
	N	33.3	20	17.5	0	16.7	16.7	8.3	0		
	A+SA	66.7	60	71.5	60	75	50	50	100		
A14	SD+D	16.7	10	38.1	20	16.6	25	8.3	0	0.339	0.977
	N	33.3	30	20.6	20	50	25	16.7	0		
	A+SA	50	60	41.3	60	33.3	50	75	100		

* Asymptotic Significance (2-sided); CB: Covid Before, CA: Covid After,
SD:Strongly Disagree, D: Disagree, N: Neutral, A: Agree, SA: Strongly Agree

Some of these might require the professor to change their teaching styles from what they are accustomed to. Most of the 1st 2nd and 3rd year students agreed with the statement that professors should have course materials (assignments, PowerPoint presentations, etc.) available online before Covid-19 and in transition period. In transition period, many in-class courses were transferred to online and they have been delivered either asynchronously or synchronously. While posting course materials to online platforms in asynchronously, a very high number of the instructors have been using Zoom, Google classroom, Microsoft Teams, etc, to host live lectures. Zoom have been the most popular tool for live lectures. Most of the 1st, 2nd and 3rd year students changed their minds negatively in transition period for the item "Learning in Zoom is much better than learning in the classroom environment.". While 50% of the 1st year students agreed before Covid-19, 80%

of them disagreed in transition period. Likewise, 42% of the 2nd year students agreed before Covid-19, 40% of them disagreed in transition period, and 83% of the 3rd year students agreed before Covid-19, but only 25% agreed and 50% of them disagreed in transition period (Table 9: A12). For all grades, students agreed that they really benefited from attending ZOOM lecture even when notes were available online and they preferred audio recorded lectures were posted in advance to D2L, then discussed their questions in ZOOM meeting before and in transition period (Table 9: A13, A14).

Table 10 Perceptions on technology use according to gender (%)

Gender (%)		MALE CB (n=64)	MALE CA (n=20)	FEMALE CB (n=29)	FEMALE CA (n=13)	χ² * CB (T=93)	χ² * CA (T=33)
A5	SD+D	3.2	15	0	15.4		
	N	14.1	5	17.2	15.4	0.869	0.339
	A+SA	82.9	80	82.7	69.2		
A6	SD+D	3.1	0	0	7.7		
	N	6.3	5	3.4	0	0.728	0.426
	A+SA	90.6	95	96.6	92.3		
A7	SD+D	12.5	5	6.8	7.7		
	N	23.4	30	13.8	30.8	0.401	0.54
	A+SA	64.1	65	79.3	61.5		
A8	SD+D	28.1	40	34.5	38.5		
	N	21.9	30	37.9	23.1	0.286	0.381
	A+SA	50	30	27.6	38.5		
A12	SD+D	25	55	20.7	53.9		
	N	26.6	20	31	23.1	0.388	0.965
	A+SA	48.4	25	48.3	23.1		
A13	SD+D	15.7	25	10.3	38.5		
	N	21.9	20	6.9	0	0.306	0.536
	A+SA	62.5	55	82.8	61.6		
A14	SD+D	31.2	25	27.5	7.7		
	N	21.9	20	31	30.8	0.059	0.735
	A+SA	46.9	55	41.4	61.6		

* Asymptotic Significance (2-sided); CB: Covid Before, CA: Covid After, SD:Strongly Disagree, D: Disagree, N: Neutral, A: Agree, SA: Strongly Agree

The great majority of the students agreed that classrooms with Internet access enrich their learning before Covid-19 (82.9% of males and 82.7% of females), but their agreement levels decreased to 80% for the males and 69.2% for the females in transition period (Table 10: A5). Again, most of the male and female students agreed that the use of technology in classroom increased their engagement and interests in the subject matter and, they would like to see the course materials (assignments, PowerPoint presentations, etc.) on the course site on both traditional and online education before Covid-19 and in transition period (Table 10: A7). Both males and females did not like online discussion forms as a required part of the course. About 48% of males and females agreed that learning in Zoom is much better than learning in the classroom

environment before Covid-19, more than half of the male and female students disagree in transition period (Table 10: A12). 62.5% of male students believed that they really benefited from attending Zoom meeting even when notes are available online before Covid-19, it reduced with a small difference to 55% in transition period, however it reduced from 82.8% to 61.6% for the female students (Table 10: A13). On the other hand, while 46.9% of male students agreed that they preferred audio recorded lectures were posted in advance to D2L, then discuss their questions in Zoom meeting before Covid-19, 55% of them agreed in transition period, similarly, 41.4% of the female students agreed before Covid-19 and 61.6% agreed in transition period (Table 10: A14).

When the independency of gender and each item components before Covid-19 and in transition period was tested by using Chi-square test with the hypotheses:

Ho: Item components are independent of Gender versus

H1: Item components are related to gender

At the level of significance 5%, it was found that all p values were greater than 0.05, hence item components were independent of gender (Table 9, Table 10).

4.4 How the perceptions changed according to grades

Another aim of this study is to look at how the perceptions changed according to their grades from before covid-19 to in transtion period. Out of 93 participant students, 42 of them got A, 29 got B, 18 got C, 2 got D, and 2 got F, before Covid-19, and in transition period out of 33 participant students 14 got A, 9 got B, 7 got C, 1 got D and 2 got F.
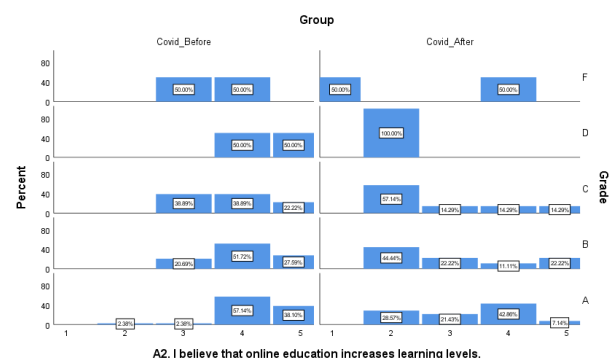

Fig. 5 Perceptions of learning levels with online courses according to grades (%)

While most of the students agreed that the online education increased learning levels before Covid-19 with different grades, 95.2% for grade A, 79.3% for

grade B, 61.1% for grade C, 100% for grade D and 50% for grade F, agreement levels of students dropped dramatically in transition period, 50% for grade A, 33.3% for grade B, 28.6% for grade C, 0% for grade D and 50% for grade F. Especially, lower grade students (D and F) disagreed in transition period (Fig. 5)
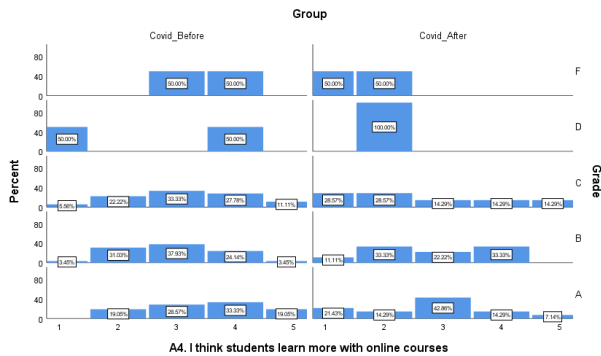

Fig. 6 Perceptions of learning with online courses according to grades (%)

About 52% of the students with grade A believed that they learned more with online courses before Covid-19, only 21.4% of them agreed and 35.7% of them disagreed in transition period. The students with lower grades (D and F) 50% of them agreed that online education increased the learning level before Covid-19, they all disagreed in transition period. Although the small amount of negative change on the level of agreement of students with grade B and C from before Covid-19 to in transition period, their disagreement levels increased in transition period, but not as much as gade A, D and F (Fig. 6).
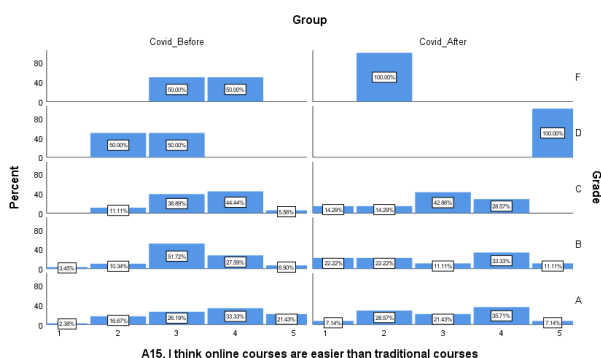
Fig. 7 Perceptions of comparison of easiness of courses with online and traditional courses according to grades (%)

When the easiness of courses with online versus traditional were compared according to the received grades from before Covid-19 to in transition period, the agreement of students received grade A, C and F decreased, from 54.7% to 42.8% for grade A, from

50% to 28.6% for grade C and from 50% to 0% for grade F, however, the agreement level was increased from 34.5% to 44.4% for the grade B and from 0% to 100% for the grade D (Fig. 7).
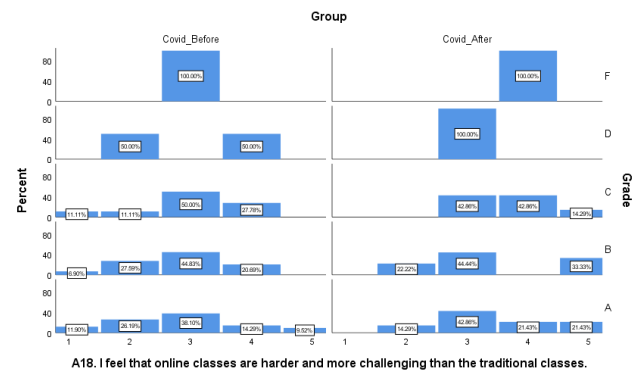

Fig. 8 Perceptions of hardness of online versus traditional courses comparison according to grades (%)

When the students agreement levels were compared on the statement the online courses were harder and more challenging than the traditional courses, it was changed positively for the students who received the grade A, B, C and F. Interestingly, while 50% of the students who received grade D, agreed and 50% of them disagreed before Covid-19, 100% of them neither agreed nor disagreed in transition period (Fig. 8).
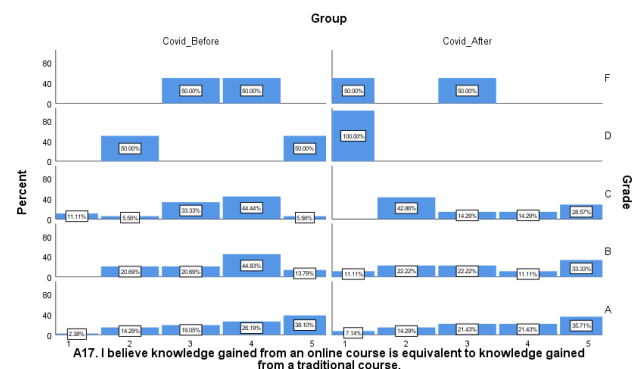

Fig. 9 Perceptions of learning levels with online and traditional courses according to grades (%)

The agreement levels of all students with different grades decreased for item measuring "the knowledge gained from an online course was equivalent to knowledge gained from traditional course" from before Covid-19 to in transition period, i.e., it changed from 64.3% to 57.1% for grade A, from 58.6% to 44.4% for grade B, from 50% to 42.9% for grade C and from 50% to 0% for both grades D and F. More negative changes were seen for grade D and F (Fig. 9).
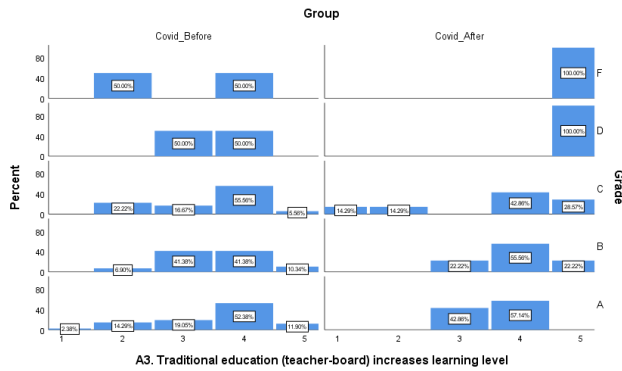
Fig. 10 Perceptions of learning levels with traditional courses according to grades (%)

Fig. 10 illustrated the perceptions of learning levels with traditional courses before Covid-19 and in transition period according to the grades. As it was seen that most of the students believed that learning levels increased with traditional education in transition period. Students might have faced problems while studying the online courses by themselves even though the course materials were posted to the online platform.
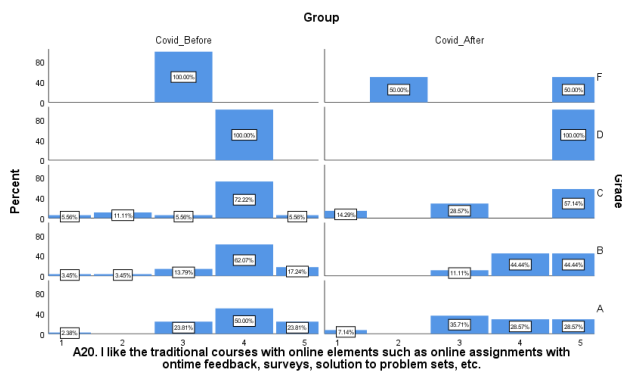

Fig. 11 Perceptions of traditional courses with online elements according to grades (%)

There were some agrement differences on preferences of traditional courses with online assignments according to grades between before Covid-19 and in transtion period. While the agreement level decreased from 73.8% to 57.2% for grade A and from 77.8% to 57.1% for the grade C and from 0% to 50% for grade F. It remained the same (%100) for students who earned grade D. While 100% of students with grade F neither agreed nor disagreed before Covid-19, 50% of them agreed and 50% of them disagreed in transition period (Fig. 11).
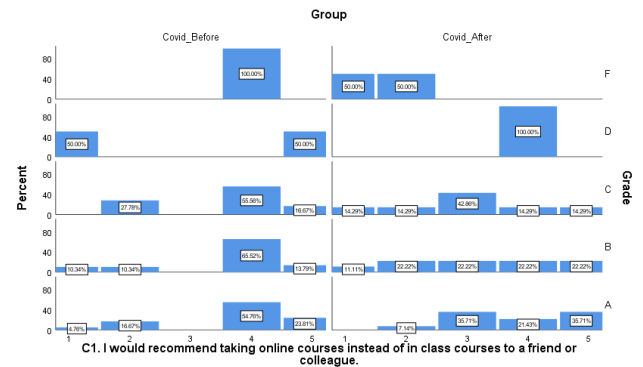

Fig. 12 Perceptions of recommending and taking online courses to a friend according to grades (%)

Fig. 12 shows the the distribution of students' preferences on recommending and taking online courses instead of in class courses before Covid-19 and in transition period according to their grades. The agrement level of students with grade A and B decreased approximately 21% for grade A and 35% for grade B from before Covid-19 to in transition period. This decreasement percent for grade C was 43.7%, for grade F it was 100%. However, the students agreement levels increased from 50% to 100% for grade D.
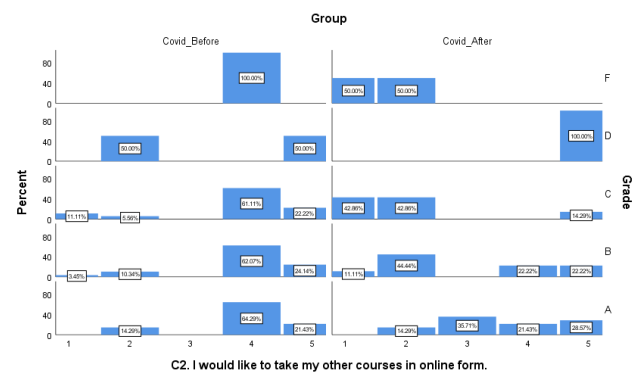

Fig. 13 Perceptions of taking other courses in online form according to grades (%)

Perceptions of taking other online courses have been changed according to the received grades from before Covid-19 to in transition period. The agrement level of students with grade A and B seemed to be approximately the same before Covid-19 and in transition period, decreased approximately 40%. This decreasement percent for grade C was 70%, and for grade F was 100%. However, interestingly the students agreement level increased from 50% to 100% for grade D (Fig. 13).

Table 11 Perceptions of technology in class according to grades (%)

Grade (%)		A		B		C		D		F		χ² *	
		CB (n=42)	CA (n=14)	CB (n=29)	CA (n=9)	CB (n=18)	CA (n=7)	CB (n=2)	CA (n=1)	CB (n=2)	CA (n=2)	CB (T=93)	CA (T=33)
A5	SD+D	2.4	7.1	0	11.1	5.6	28.6	0	100	0	0	0.905	0.035
	N	16.7	0	10.3	11.1	16.7	14.3	0	0	50	50		
	A+SA	81	92.8	89.6	77.8	77.8	57.2	100	0	50	50		
A6	SD+D	0	0	6.9	0	0	14.3	0	0	0	0	0.060	0.309
	N	2.4	0	10.3	0	0	14.3	0	0	50	0		
	A+SA	97.6	100	82.8	100	100	71.5	100	100	50	100		
A7	SD+D	7.1	7.1	10.3	0	16.7	14.3	50	0	0	0	0.474	0.610
	N	11.9	14.3	24.1	44.4	33.3	42.9	0	0	50	50		
	A+SA	80.9	78.6	65.5	55.5	50	42.9	50	100	50	50		
A8	SD+D	28.6	42.8	34.5	11.1	27.8	42.9	50	100	0	100	0.308	0.204
	N	31	14.3	24.1	55.6	22.2	28.6	0	0	50	0		
	A+SA	40.5	42.8	41.3	33.3	50	28.6	50	0	50	0		
A12	SD+D	19.1	50	27.6	55.5	33.3	57.2	0	0	0	100	0.683	0.204
	N	35.7	35.7	27.6	22.2	11.1	0	0	0	50	0		
	A+SA	45.3	14.2	44.8	22.2	55.6	42.9	100	100	50	0		
A13	SD+D	16.6	21.4	10.3	33.3	16.7	28.6	0	100	0	50	0.096	0.406
	N	9.5	14.3	20.7	0	22.2	14.3	0	0	100	50		
	A+SA	73.9	64.3	69	66.6	61.1	57.2	100	0	0	0		
A14	SD+D	28.5	7.1	37.9	11.1	22.2	28.6	0	100	50	50	0.531	0.000
	N	21.4	21.4	27.6	22.2	27.8	28.6	0	0	50	50		
	A+SA	50	71.4	34.5	66.7	50	42.9	100	0	0	0		

* Asymptotic Significance (2-sided); SD: Strongly Disagree, D: Disagree, N: Neutral, A: Agree, SA: Strongly Agree, CB: Covid Before CA: Covid After

Table 11 summarizes the preceptions of technology use according to grades before Covid-19 and in transition period. While the students' preferences positively changed from 81% to 92.8% for grade A, and negatively changed from 89.6% to 77.8% for grade B, from 77.8% to 57.2% for grade C and from 100% to 0% for grade D (Table 11: A5). It remained the same for grade A. However most of the students with different grades believed that the use of technology in the classroom increased their engagements and interests in the subject matter (Table 11: A6). Most of the students did not believed that online discussion forms would help them both before Covid-19 and in transition period (Table 11: A8). There was a small amount of decrease of the students with grade A, B, C for which learning in Zoom was much better than learning in the classromm environment from before Covid-19 to in transition period, it remained the same (100%) for grade D but decreased from 50% to 0 % for grade F (Table 11: A12). While the students with grade A, B and C believed that they have benefitted attending Zoom meetings when the notes were available online in the similar percentage levels before Covid-19 and in transition period, but 100% of the students with grade D and 50% of the students with grade F disagreed in transition period (Table 11: A13). On the other hand, the students with grade A and B for which they preferred audio recorded lectures posted in advance to D2L, then discuss their questions in ZOOM meeting, increased from Covid-19 to in

transition period, but the students' preferences with grade C decreased from 50% to 42.9% and with grade D decreased from %100 to 0% in transition period. 50 % of students with grade F disagreed in both before Covid-19 and in transition period. (Table 11: A14).

4.5 The impact of the number of online courses taken before Covid-19 and in transtion period

Another aim of this study was to examine the impact of students' online experience measured in terms of the number of courses taken online on their perceptions change from before Covid-19 to in transition period. Out of 93 students before Covid-19, 43 of them took one online course, 18, 11, 7, 3 and 11 of them in order took 2, 3, 4, 5 and more than 5 online courses. In transition period, however, out of 33 students, 5, 13, 6, 2, 1 and 6 of them took 1, 2, 3, 4, 5, and more than 5 online courses respectively.
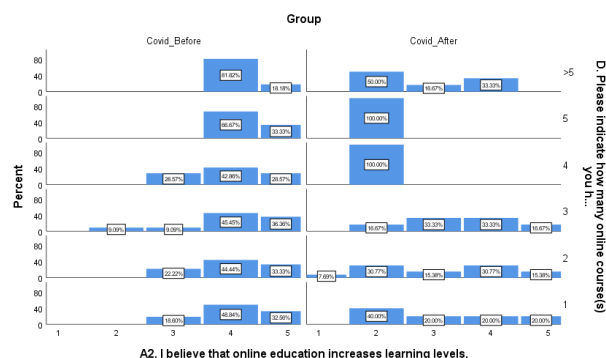

Fig. 14 Perceptions of learning levels with online education versus the number of courses taken online (%)

81.4% of the participant students who took one online course before, agreed that online education increased learning levels before Covid-19, but this agreement reduced to 40% in transition period. Likewise, while 77.7% of the students who took two online courses before Covid-19, agreed, but it reduced to 46.2% in transition period; it reduced from 81.9% to 50% for the students who took 3 online courses; from 71.5% to 0% for the students who took 4 online courses and from 100% to 0% for the students who took five online courses; and finally, it reduced from 100% to 33.3% for the students who took more than five online courses. According to these results all students changed their mind negatively in transition period, even though the students took more than 5 five online courses (Fig. 14).
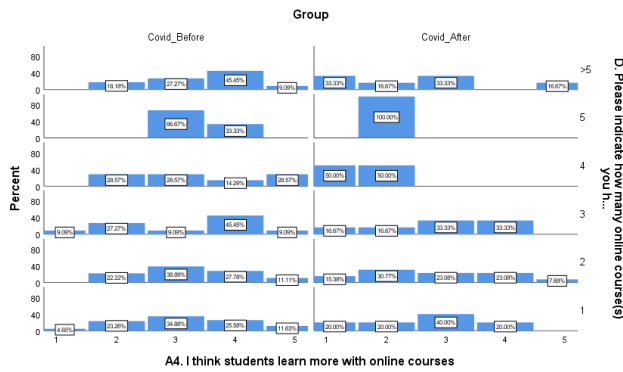
Fig. 15 Perceptions of learning more with online courses versus the number of courses taken online (%)

The participant students who took 1, 2, 3 4, 5 and more than 5 courses had similar perceptions of learning more with online courses in before Covid-19 and in transition period. While they agreed that students learned more with online courses before Covid-19, most of students disagreed in transition period. This could be caused by a shift from in-class learning to online learning for all courses in the transition period (Fig. 15). Even with their online learning experience, the students are reluctant of the switch to online learning for all their courses.
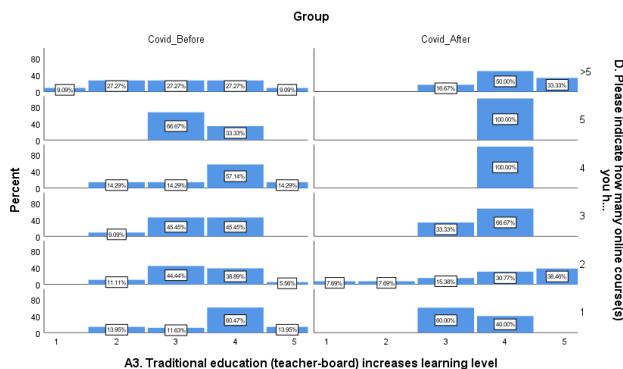

Fig. 16 Perceptions of learning levels with traditional education versus the number of courses taken online (%)

Fig. 16 illustrates the perceptions of how the traditional education increases learning levels before Covid-19 and in transition period. It does not matter how many times they took the online course, most of the students believed that traditional courses increased the learning level in transition period.
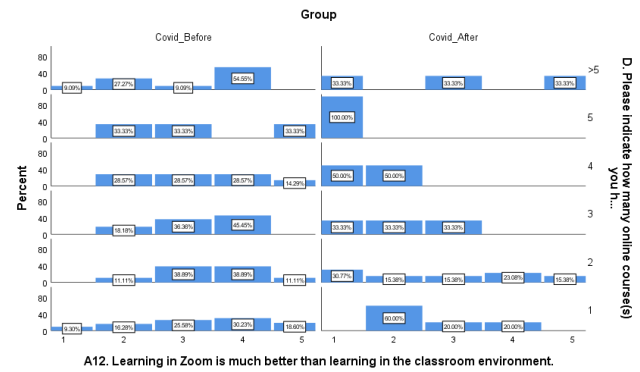

Fig. 17 Perceptions of learning in zoom versus in-class according to the number of courses taken online (%)

Before Covid-19, almost 50% of the students who took the online course 1, 2, 3, 4, 5, and more than 5 times believed that learning in zoom is much better than learning in the classroom, but, in transition period this attitude changed negatively, 60% of students took one online course, 46.2% of them took 2 online courses, 66.6% of them took 3 online courses, 100% of them took 4 and 5 time and 33.3% of them took more than 5 online courses disagreed that learning in zoom is much better than learning in the classroom. They generally preferred in class courses instead of online courses (Fig. 17).
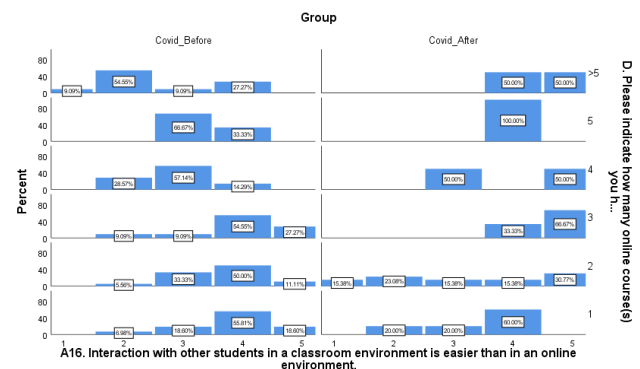

Fig. 18 Perceptions of interaction with the others in online and traditional environment according to the number of courses taken online (%)

Fig. 18 shows that there are some perception differences about the easiness of interaction with the other students in online and the traditional environment between Covid-19 and in transition period based on their online learning experiences. While the agreement percentages of the students who took one and two online courses decreased from 74.4% to 60% and from 61.1% to 46.2% in transition period respectively, the agreement percentages of students who took three, four, five and more than five courses increased from 81.8% to 100%, from 14.3%

to 50%, from 33.3% to 100% and 27.3% to 100%, respectively.
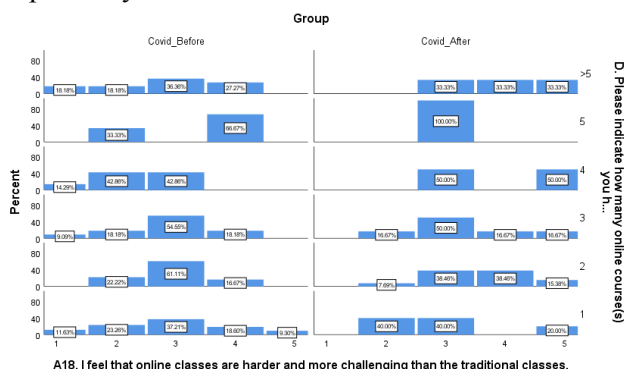
Fig. 19 Perceptions of hardness of online and traditional courses according to the number of courses taken online (%)

Most of the students believed that the online classes are harder and more challenging than the traditional classes between Covid-19 according to the number of courses taken online, but most of them were neither agreed nor disagreed and some of them especially 50% of the students who took three and more than five courses agreed in transition period (Fig. 19). This shows that students who took 3 or more courses had more experience and they learnt how to communicate with the other students easily. During the live class, they are asking each other on zoom chat if they have a Whatsup group, facebook group or google groups.
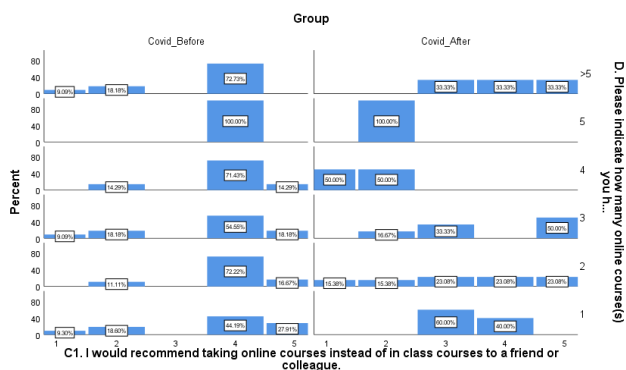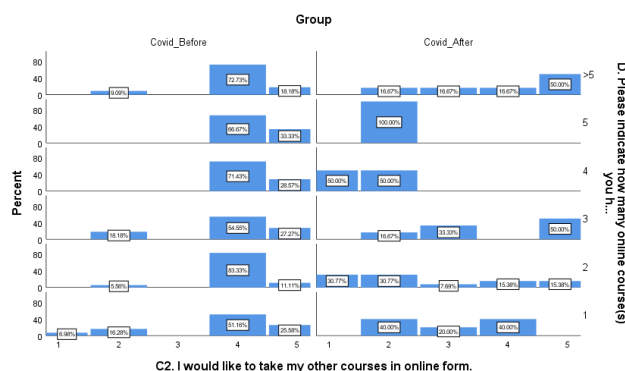

Fig. 20 Perceptions of recommending online courses to others according to the number of courses taken online (%)

Although more than 80% of students who took different number of courses online agreed that they would recommend taking online courses instead of in class courses to a friend before Covid-19, in transition period their perceptions changed, especially for the students who took four and five online courses before, they were all disagreed, interestingly, the students who took more than five

courses, they did not changed their minds. On the other hand, the students who took two or three courses showed the same agreement levels (approximately 50%) (Fig. 20).

Fig. 21 Perceptions of taking other courses in online form according to the number of courses taken online (%)

A large number of the students who took different number of courses online agreed that they would take their other courses online before Covid-19, but in transition period only 66.7% of the students who took more than 5 online courses and 50% of the students who took 3 online courses agreed. The other students who took one, two, four and five online courses mostly disagreed to take other courses online. (Fig. 21). It seemed that the more online learning experience the students have, the more willing they are to learn the subject matter online, i.e. enroll in an online course.

5 Summary and Conclusion

Online education has grown rapidly globally during the recent years. In this age of technology and global communications through the internet and other technological means, the global education market has become very dynamic. The traditional face-to-face education has changed substantially with the support of technology. This has made learning borderless. Both the private and public universities are competing to offer courses online. This competition has spread globally. Now the students can take courses virtually from another university in another country. With this competition, many universities are striving to improve their online course offering. Like marketers, education providers try to meet their students' needs so that students will succeed in online learning. The agenda of this research is to examine the students' perception and preference so that instructors can meet the students' needs to learn online. Before the pandemic, students can pick the learning format. Given the pandemic, students have

no choice but to learn online. Moving forward, this will be the new normal of learning globally.

During this transition period of pandemic, students were forced to take all courses online, of course, and the instructors were also forced to teach online. It is obvious that both students and instructors as well as the universities were affected somehow by these sudden changes. In this study, students from a university in Canada were surveyed to find out how the impact of pandemic on students' perceptions and their view on technology use in class. The following are some of the specific findings and recommendations:

- There is no evidence that the students' perception on online attributes are dependent on class standings, gender, and the grades.

- All students agree that the course materials (PowerPoint presentations, assignments, etc.) should be posted on the course website for both traditional and online courses. Even when lecture notes are posted online, they pay attention to lectures and they still take notes. The slides help them to follow the lectures, take notes on them and adequately prepare them for the examination.

- While they believe that learning online is easier than learning in class before Covid-19, their opinions slightly changed in transition period.

- While most of them agreed that they learn more with online courses and online courses increases learning levels before Covid-19, only 25% of them agreed in transition period. The participant students who took 1, 2, 3 4, 5 and more than 5 courses had similar perceptions of learning more with online courses before Covid-19 and in transition period. While they agreed that students learned more with online courses before Covid-19, most of them disagreed in transition period. This could be caused from taking all courses online in transition period. In general, students agreed on easiness, reliability, and effectiveness of D2L as a good tool for learning before Covid-19 and in transition period.

- A very large majority of the students believe that the use of technology in the classroom increases their engagement and interest in the subject matter before Covid-19. Since the students and universities were not ready for full online education, they faced with so many problems due to technology infrastructure, such as internet connection, online platforms for the live lectures in the transition period. Some students must join the lectures, write the tests with different time zone. Thus, a large majority of the students believed that a traditional course with online

elements would be ideal for both before Covid-19 and in transition period.

- While the students with grade A, B and C believed that they have benefitted attending Zoom meetings when the notes were available online in the similar percentage levels before Covid-19 and in transition period, the students with grade, lower than grade D, disagreed in transition period. This maybe due to the transition shock and students might have faced some adaptation problems with online learning. They were not given time to adjust to the immediate imposed of online learning during the transition period.

- Most of the students do not support discussion board in D2L where they can participate. This shows that students prefer face–to–face discussions instead of virtual discussions.

- A large majority of the students changed their minds negatively in transition period for the item "Learning in Zoom is much better than learning in the classroom environment" even though they have online learning experience. Again, living in different time zone, internet problems, isolation feelings, etc., changed the perceptions of students. Because of these problems, students prefer in class courses instead of online courses.

- A large number of the students with online learning experience believed that the online classes are harder and more challenging than the traditional classes between Covid-19 periods, but most of them were neutral. About 50% of the students who took three and more than five courses agreed that the online classes are harder and more challenging than the traditional classes in transition period. This shows that students who took 3 or more courses had more experience on online learning and they learnt how to communicate the other students easily. During the live class, they are asking each other on zoom chat if they have a Whatsup group, facebook group or google groups for communication outside virtual class time.

- Although more than 80% of students who took different number of courses online agreed that they would recommend taking online courses instead of in class courses to a friend before Covid-19, in transition period their perceptions changed, especially for the students who took four and five online courses before, they were all disagreed. Interestingly, the students who took more than five courses, they did not changed their minds. On the other hand, the students who took two or three courses showed the same agreement levels (approximately 50%)

- A large number of the students who took different number of courses online agreed that they would take their other courses online before Covid-19, but in transition period only 66.7% of the students who took more than 5 online courses and 50% of the students who took 3 online courses agreed. The other students who took one, two, four and five online courses mostly disagreed to take other courses online.

- Although there is no significant difference between the perceptions of male and female students on the survey questions, it was noticed that female students most probably had more difficulty in transition period, given that the female responses are opposite that of male students. The female's positive percentages for the statements were higher than that of the male students and the female's negative percentages of the statements lower than the male students.

- There are some class standing differences about the survey questions. In general, 4th year students have different opinions than the others. This is because there is only one 4th year student in transition period. The number of students should be increased to get a good representative.

According to a survey by Canadian health ministry, the mental problems were increased dramatically during the pandemic. Everybody is shocked and the lifestyles have changed suddenly due to the lockdown imposed in some provinces in Canada. Of course, these sudden changes bring some health problems. The main conclusion for this study is that the students were not ready to take all courses online. It is recommended that a more focused study is conducted to determine the impact of technology in the classroom and online live lectures. For future studies, the same survey could be conducted with a large sample size to find out how the perception of students change during the pandemic and after the pandemic. In addition, further studies are warranted to explore how this curtailment might impact educators' approaches to Business education.

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Clare Chua and Nursel Ruzgar prepared the survey and applied, did statistics and interpret together.