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Student’s perspective on distance learning during COVID-19 pandemic: A case study of Western Michigan University, United States

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A R T I C L E   I N F O

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- College level
- College type
- Students’ perception
- Teaching methods
- Students’ interaction

A B S T R A C T

As the distance learning process has become more prevalent in the USA due to the COVID-19 pandemic, it is important to understand students' experiences, perspectives, and preferences. Our study’s purpose is to reveal students’ perspectives and preferences on distance learning due to the dramatic change that happened in the education process. Western Michigan University is used as the case study to achieve that purpose. Participants completed an online survey that investigated two measures: distance learning and instructional methods with a set of scales associated with each. Students reported negative experiences of distance learning such as lack of social interaction and positive experiences such as time and location flexibility. These findings may help WMU and higher educational institutions to improve distance learning education.

1. Introduction

The benefits and challenges of distance learning have been a subject of continuous discussion in the past. Of recent, the topic of distance learning has become more relevant and imminent due to the COVID-19 pandemic. The COVID-19 has compelled most of the higher education institutions to shift to either distance learning and/or some form of hybrid teaching model (Smalley, 2020). This has disrupted the natural ecosystem of conventional learning environments where students live and study in close proximity. Challenges that have been raised in the previous studies about distance learning include variation in the quality of educational instructions, students’ unequal access to the essential technologies for distance learning, and technology readiness of students (Ratliff, 2009). For example, one study found that 20% of students reported having issues in accessing essential technology for distance learning such as laptops and high-speed internet (Gonzales, Calarco, & Lynch, 2018). Also, it has been found that students who were already suffering academically in face-to-face instruction are more likely to obtain lower grade points in distance learning (Xu & Jaggars, 2014). Despite the challenges, this sudden and unexpected change in the learning environment offers opportunities for academic institutions to reimagine innovative modes of learning that take advantage of the current technologies. Therefore, the challenges and opportunities of shifting from in-person instruction mode to remote/distance instruction mode need a thorough assessment. This study intends to explore the benefits and challenges of distance learning based on student’s perspectives. The case study selected 5000 students randomly from all undergraduate and graduate students at Western Michigan University to participate in the survey and got 420 responses.

2. Related work

Distance education, or remote learning, refers to technology-based teaching in which students during the entire course of learning are physically removed from teachers at a place. It is learning from outside the normal classroom and involves online education (Lei & Gupta, 2010). A distance learning program can be completely distance learning, or a combination of distance learning and traditional classroom instruction (called hybrid) (Tabor, 2007). This form of teaching helps teachers to access a considerably broader audience and facilitates greater versatility in the curriculum for students. Online education is a term under the distance education umbrella. It is education that takes place over the Internet. It is often referred to as “e-learning” in other terms. However, it is just one type of “distance learning”.

Many works and research were made to study the students’ perceptions of distance learning. In one of them, especially related to students’ perceived impacts of the COVID-19 pandemic, Aristovnik, Keržič, Ravšelj, Tomžević, and Umek (2020) introduced a comprehensive and large-scale study of students’ perceived impacts of the COVID-19 pandemic on different aspects of their lives on a global level. Their study sample contains 30,383 students enrolled in higher education institutions, who were at least 18 years old from 62 countries, where a

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multi-lingual web-based comprehensive questionnaire composed of 39 predominantly closed-ended questions was used to collect the data. The questionnaire addressed socio-demographic, geographic, and other characteristics, in addition to the various features and elements of higher education student life, such as online academic work and life, emotional life, social life, personal situations, changing habits, responsibilities, as well as personal thoughts on COVID-19.

Under the online academic, as part of the distance learning, work, and life element, an ordinal logistic regression analysis was used to indicate which factors influence the students’ satisfaction with the role of the university. This logistic regression model implemented in Python programming language using libraries Pandas and NumPy which is the same language that they used to prepare, clean, and aggregate their data. The results emphasize that satisfaction with asynchronous online teaching methods such as recorded videos (p<0.001), information on exams or the procedure of examination in times of crisis (p<0.001), teaching staff (lecturers), and websites, social media information have a positive effect on students’ satisfaction with the role of the university during the COVID-19 pandemic. The result also showed that the students’ workload was larger or significantly larger in online teaching, in addition to some difficulty in using online teaching platforms (Aristolnik et al., 2020).

On the other hand, to answer the question of how students experience distance learning, Blackmon and Major (2012) introduced an investigation using qualitative research synthesis to collect the data. They ended with 10 studies focusing on online learning. To analyze the data, they summarized the articles and extracted findings. The findings were grouped into student factors that influenced experience and instructor factors that influenced student experience. Students must combine work and families, handle time and devote themselves individually. In the absence of physical copresence, teachers can strive to develop academic relationships with students and to create a sense of community. The balance between student and teacher considerations affects the classroom and student interactions. According to their theoretical framework suggestion, the students are more abstract and understandably observing their academic experiences. In some situations, students appeared to miss the physical markers and signals that make social interactions easier to discuss. In other situations, some students seemed to succeed in the new environment. Although the student must be responsible, the teacher also has a significant role to do to generate creative online environments that facilitate the delivery and use of new intellectual skills.

Another survey of professors, staff, and students was commissioned by Illinois Community Colleges Online in 2005 to determine the pressing concerns affecting quality, retention, and capacity building related to online learning. About one thousand people from seventeen Illinois community colleges presented data relating to these three problems over six months (Hutti, 2007). Three separate methods were used in the data collection method: an electronic survey of faculty, employees, and students; a focus group including faculty, employees, and students; and interviews with select faculty, employees, and students. The findings of the review of the collected data showed that the consistency benchmarks that were most important and least important for distance learning, especially online learning, were decided by faculty, staff, and students. Using a four-point Likert Scale (Strongly Agree = 4, Agree = 3, Disagree = 2, and Strongly Disagree = 1), all three groups of respondents were asked to rate the importance of each quality benchmark. The top 5 quality benchmarks rated most important based on highest means where technical assistance in course development is available to faculty, a college-wide system (such as Blackboard or WebCT) supports and facilitates the online courses, faculty are encouraged to use technical assistance in course development, faculty give constructive feedback on student assignments and to their questions, and faculty are assisted in the transition from classroom teaching to online instruction (Hutti, 2007).

To focus on a specific level college, Fedynich, Bradley and Bradley (2015) studied the graduate students’ perceptions regarding distance learning using the analysis of an online survey. Their findings indicate that the role of the teacher, the contact between students and with the teacher, and feedback and assessment were identified as being essential to the satisfaction of the students. Other difficulties found included technical support for learners connected to campus services, and the need for differing educational design and implementation to promote the ability of students to study. Students, on the other hand, were highly pleased with the consistency and organization of teaching using the right tools.

In order to find ways to improve and support distance learning, faculty members in the Distance Education Center at the University of West Georgia came together to form the “Online Refresh Faculty Learning Community” (FLC) (Rath, Olmstead, Zhang, & Beach, 2019). They introduced a study conducted at a public comprehensive university located in the northeastern United States. The participants were invited to answer an online survey through Qualtrics that collected quantitative and qualitative data. Coding sheets in Excel and SPSS were used for analyzing quantitative data where qualitative data were analyzed using grounded theory procedures. In the qualitative data, the result under the factor of comfort level using technology showed 55% of participants were extremely comfortable using technology and only 2% were uncomfortable. Under the preferred course modality factor, students preferred the in-person courses followed by the online courses, and at last, the hybrid/blind courses. Four factors were addressed in the qualitative data results, set-up of the course; learner characteristics and sense of course learning; social interactions; and technology issues. Regarding how the course set up by the instructor influenced the perceptions of students about the quality and efficacy of distance learning environments, successful contact was considered as a key to an online course’s progress. Next, the clear due dates and understandable instructions on assignments came as important components of the course organization. Under learner characteristics, distance learning works best for the students who demonstrate strong self-regulatory behaviors and managing their time. Also, many students in their study surveyed reported frustration with learning online applications and with the lack of reliability of the internet. On the other hand, their result showed clearly, the social aspect of face-to-face classes is very important and valuable to most students.

Students stated some advantages for distance learning such as saving time, fitting in better with schedules, enabling students to take more courses, self-paced study, time and space flexibility, distance learning course often costs less (O’Malley & McCraw, 1999). The disadvantages of distance learning that were mentioned include the need for consistent access to technology, the absence of face-to-face contact (Young & Norgard, 2006), the feeling of isolation, the challenge to remain focused, and the difficulty of obtaining immediate feedback (Lei & Gupta, 2010; Paepe, Zhu, & Depryck, 2017; Venter, 2010; Zuhairi, Zuhairi, Wahyono, & Suratniah, 2006).

Many recommendations arising from the previous studies include the following suggestions; continue to offer the courses in many formats (in-person and online) to provide a choice for students, continue to offer professional development and training for instructors (Burns, 2013), providing the learners with social support and sufficient motivation, instead of providing only synchronous or only asynchronous practices, using these environments together (Allen, 2017; Cankaya & Yunkul, 2018) consider the students who have complex and special needs with special education support, try to open communication channels among administrators, educators, and students and improve mental wellness programs and provide proactive psychosocial help to students (Allen, 2017).

3. Purpose

The purpose of the present study was to share information and experiences that can positively impact distance learning in WMU, besides revealing the factors that affect the students’ experience and investigating the impact of student and college characteristics on perceptions of online learning. The study examined two key college characteristics
– namely, college-level and college type to reveal the students’ preferences and experiences of distance learning at WMU. The study pursued to address the following explicit research questions:

1. What are the WMU students’ general perceptions about distance learning?
2. What are the significant differences in perceptions of distance learning when comparing different college types?
3. How are perceptions of graduate-level students differ from the perceptions of undergraduate-level students of distance learning?
4. What are the students’ preferences regarding instructional methods of distance learning?

4. Method

4.1. Data collection procedure

The survey was administered online through Western Michigan University’s official website, Qualtrics. Qualtrics platform is a powerful platform for survey design, and it was available on the WMU official website to all WMU students, faculty, and staff. Informed consent and a link to the survey were distributed to students through the university e-mail. Students were asked to state their perceptions and preferences by choosing one choice in a Likert scale survey. An option is also provided for the subject to input additional comments. Students were able to complete the survey in approximately 10-15 minutes at their own convenience within two weeks. No identifiable private information was obtained from the participants.

4.2. Participants

The participants in this study were 420 undergraduate and graduate students enrolled in different distance learning - education courses during the 2019-2020 academic year at Western Michigan University, the U.S. Of the participants, 251 were female (59.76%), 160 were male (38.10%), and 9 (2.14%) were identified as other, with an age range of 18-55 years and above. In terms of college-level, 72 (17.14%) of participants were freshmen, 57 (13.57%) were sophomores, 74 (17.62%) were juniors, 105 (25.00%) were seniors, 107 (25.48%) were graduate students, and 5 (1.19%) were identified as other. The study considered all 11 colleges at WMU. Most of the participants, 107 (25.48%) from the College of Arts and Sciences (CAS), 22 (5.24%) from College of Aviation (CA), 51 (12.14%) from Haworth College of Business (HCB), 61 (14.52%) from College of Education and Human Development (CEHD), 81 (19.29%) from College of Engineering and Applied Sciences (CEAS), 29 (6.90%) from College of Fine Arts (CFA), 48 (11.43%) College of Health and Human Services (CHHS), 3 (0.71%) from Lee Honors College (LHC), 14 (3.33%) from Graduate College (GC), 0 (0.00%) from Thomas M. Cooley Law School (TMCLS) and Homer Stryker M.D. School of Medicine, respectively. Tables 1 and 2 depict the participants’ gender and age by college level and college type, respectively.

To assess the sample representativeness, the survey sample size was compared with the total number of students in WMU by college level and age. Out of 22,562 students at WMU, 4802 (21.28%) were graduate students and 17,760 (78.72%) were undergraduate students. The total percentage by college-level aligned well with the survey sample size, whereby out of 420 participants, 107 (25.48%) were graduate students and 313 (74.52%) were undergraduate students. In terms of age group, most of the WMU students were below 24 years old (75%), followed by 24-34 years (17%) and greater than 34 years (8%). The same pattern was observed in the survey sample size with students below 24 years constituting 69% followed by 24-34 years (19%) and greater than 34 years (12%).

4.3. Measures

The survey incorporated demographic questions, Likert scale questions, and open-end questions. Participants answered five demographic questions regarding gender, age, college level, college type, and department types. Also, they were asked to rate the items using a five-point scale (“Strongly Agree”, “Agree”, “Neutral”, “Disagree”, “Strongly Disagree”). In addition, the participants were asked to input additional comments as open-end questions. The Likert scale and text-based measures are reconstructed into scales and items as shown in Table 3 and Table 4, respectively.

5. Statistical Methods

The distributions of student’s responses to distance learning were analyzed using cross-tabulations and statistical tests. The Chi-square test of independence was used to test if there was a significant association between students’ response to the distance learning experience by college level and college type. The Chi-Square test is a non-parametric test, and it is suitable for categorical data analysis to assess the probability of association or independence of facts (McHugh, 2012). It does not impose prior conditions to the data such as equality of variance or residual homoscedasticity (Pandis, 2016). The test measures how much difference exists between the observed counts and the counts that would be expected if there were no relationship at all in the population. In this study, the null hypothesis (H₀) stated that there is no difference in student rating of a given question related to distance learning across college level or college type. The alternative hypothesis (H₁) is the inverse of the null hypothesis stating that there is a difference in student ratings by college type or college level. The null hypothesis was rejected if the p-value was less than 0.05. The Chi-square statistics can be computed using Eq. (1);

$$\chi^2 = \sum \sum \frac{(O_{ij} - E_{ij})^2}{E_{ij}}$$  (1)

whereby, $O_{ij}$ is the observed frequency and $E_{ij}$ is the expected frequency. The computed $\chi^2$ is compared with the critical value obtained from the Chi-square distribution. The degrees of freedom (df) for the critical value can be computed as $(c-1) \times (r-1)$, where $c$ is the number of columns and $r$ is the number of rows in the contingency table.
Table 2
Participants’ gender and age by college type,

|       | CAS  | CA   | HCB  | CEHD | CEAS | CFA  | CHHS | LHC  | GC   | Missing |
|-------|------|------|------|------|------|------|------|------|------|---------|
| Total | 107  | 22   | 51   | 61   | 81   | 29   | 48   | 3    | 14   | 4       |
| Gender |      |      |      |      |      |      |      |      |      |         |
| Female | 73   | 5    | 29   | 46   | 25   | 18   | 43   | 2    | 6    | 4       |
| Male   | 29   | 17   | 22   | 14   | 56   | 8    | 5    | 1    | 8    | 0       |
| Other  | 5    | 0    | 0    | 1    | 0    | 3    | 0    | 0    | 0    | 0       |
| Age range |      |      |      |      |      |      |      |      |      |         |
| < 24 years old | 74 | 19 | 41 | 28 | 63 | 26 | 27 | 3 | 6 | 2 |
| 25-34 years old | 20 | 2 | 6 | 19 | 14 | 2 | 12 | 0 | 5 | 0 |
| > 35 years old | 13 | 1 | 4 | 14 | 4 | 1 | 9 | 0 | 3 | 2 |

Table 3
Measures for distance learning based-Likert scale.

| Measures for distance learning | Scale | Items |
|--------------------------------|-------|-------|
| Distance learning flexibility |       | Distance learning is effective due to location flexibility (Item 1), Distance learning is effective due to class-time flexibility (Item 2), Distance learning saves your time and effort to reach the campus (Item 3), Distance learning causes spending more time doing your classwork (Item 8), You are keeping up with your schoolwork in distance learning as much as you were in personal learning (Item 10) |
| Distance learning improvement |       | Distance learning has improved on-campus classes (in-class learning) (Item 4), Distance learning has better instruction (Item 5), With distance learning, you have learned as much as you were before the COVID-19 crisis (Item 9), Distance learning improves your grades vs. personal learning (Item 11) |
| Students interaction and collaboration |       | Distance learning provides more interaction with the instructor (Item 6), Distance learning provides more interaction with classmates (Item 7) |
| Computer and internet usage |       | Distance learning is manageable because you have internet access at home (Item 12), You have access to a computer or device (other than a computer) that you can use for distance learning (Item 13) |

Table 4
Measures for instructional methods.

| Measures for instructional methods | Scale | Items |
|-----------------------------------|-------|-------|
| Instructors | Your instructor has provided you clear instructions for how to access the online instructional materials for your classes (Item 1), Your instructors are available online to you when you need help (Item 2), Your instructors have provided you with different ways to demonstrate your learning online (Item 3), Online contact with your instructor is better than face-to-face (Item 4) |
| Distance learning tools | It is easy to use distance learning tools that WMU/instructor provides (Item 5), Meeting and learning through WebEx, Zoom, and Microsoft365 are effective (Item 6) |
| Distance learning methods’ preferences | You prefer in-person or hybrid classes over online classes (Item 7), Online classes are a preferable choice due to COVID-19 crises (Item 8), You prefer asynchronous online teaching method (Require no in-person or synchronous online meetings) (Item 9), You prefer synchronous online teaching method (Classes meet exclusively through distance education technologies) (Item 10) |

Measures for instructional methods (text-based, open-ended)

1. What is the best thing about the online teaching?
2. What is the worst thing about the online teaching?

The Cramer’s V is also used in conjunction with Chi-Squared statistics. It is used to indicate the strength of association between two variables (Allen, 2017). The Cramer’s V values range from 0 which corresponds to no association to 1 which corresponds to complete association. It can be computed by taking the square root of the chi-square statistics divided by the sample size and normalized by the minimum of rows or columns in the contingency table as shown in Eq. (2)

\[ V = \sqrt{\frac{\chi^2}{n \min(c-1, r-1)}} \]  

whereby \( \chi^2 \) is the Chi-squared statistics, \( n \) is the sample size involved in the test, \( c \) is the number of columns and \( r \) is the number of rows.

6. Results

The result section is subdivided into two subsections namely students’ perceptions of distance learning and students’ perception of instructional methods. For each subsection, the students’ rating results are discussed based on college level and college type. Data were analyzed by calculating Chi-square values, p-values as discussed in the statistical methods section.

6.1. Students’ perceptions of distance learning

In this study, WMU students were asked to share their experience of distance learning as the WMU campuses were compelled to move from in-person class to distance learning class during the COVID-19 pandemic. The questions for this section were designed to capture four main aspects of distance learning which were collaboration and interactions, improvement associated with distance learning, flexible options associated with distance learning, and availability of required resources such as personal laptops and the internet for distance learning. Fig. 1 provides an overall of students’ ratings ranging from strongly agree (5 points) to strongly disagree (0 points) on the four main aspects of distance learn-
Fig. 1. Overall student’s perception of distance learning during the COVID-19 pandemic.

Table 5
Chi-Squared test of association students rating of instructional methods with college level and college type,

| Distance learning experience | College level | College type |
|------------------------------|--------------|-------------|
|                              | $\chi^2(20)$ | $\chi^2(32)$ |
| Students interaction and collaboration | Distance learning provides more interaction with classmates | 44.517 | 49.941 |
|                              | Distance learning provides more interaction with the instructor | 30.483 | 27.670 |
|                              | Distance learning has improved on-campus classes (in-class learning) | 32.797 | 29.467 |
|                              | With distance learning, you have learned as much as you were before the COVID-19 crisis | 61.764 | 34.134 |
|                              | Distance learning has better instructions | 31.089 | 37.381 |
| Distance learning improvement | You are keeping up with your schoolwork in distance learning as much as you were in personal learning | 22.491 | 23.063 |
|                              | Distance learning causes spending more time doing your class work | 18.192 | 29.467 |
| Distance learning flexibility | Distance learning saves your time and effort to reach the campus | 38.215 | 38.349 |
|                              | Distance learning is effective due to location flexibility | 37.400 | 23.063 |
|                              | Distance learning is effective due to class-time flexibility | 27.246 | 31.736 |
| Computer and internet usage | You have access to a computer or device (other than a computer) that you can use for distance learning | 14.988 | 38.914 |
|                              | Distance learning is manageable because you have internet access at home | 23.938 | 45.061 |

that were explored in this study. Distance learning flexibility had the highest ratings while student interaction and collaboration had the least ratings.

Figs. 2 and 3 present the results of students’ view of distance learning by college level and college type, respectively. Table 5 provides the Chi-square test results of students’ ratings by college level and college type. Most of the students felt distance learning disrupted and diminished interactions and collaboration with classmates and instructors. The student ratings significantly varied across college level ($\chi^2 = 44.517$, $p=0.001$) and college type ($\chi^2 = 49.941$, $p=0.023$) as shown in Table 5. For the college level, about 95% of freshmen disagree with the statement that distance learning provides more interactions with other students.
However, the percent of disagreement diminished with a higher college level as shown in Fig. 2. Only 75% of the graduate student disagree with the statement while 12% felt that distance learning increases interactions with classmates. Only 12% of the graduate students felt that distance learning increases interactions with classmates while 75% of the graduate student disagree with the statement. The same trend was observed when comparing the rate of agreement about the interaction with the instructors. Most of freshmen (87%) felt distance learning has reduced the interaction compared to only 66% of graduate students. Sophomore, Juniors, and Seniors’ percentage of disagreement with the students’ interaction ranged from 76% to 82%. From the results, it can be observed that most of the students perceived a lack of interaction among students and the instructor as the result of shifting to distance education during the pandemic, mostly the freshman. The effect was less severe to higher college level especially graduate students. College experience may have contributed to the observed pattern.

It was also the aim of this study to assess student’s perspectives on how distance learning affected their academic progress and success. Four different questions were asked under the “distance learning improvement” category as shown in Fig. 2. Most of the students indicated that distance learning did not improve on-campus classes or instructions. Further, the rating indicated that most of the students did not learn as much as they would have learned in in-person classes. On the issues of academic success, most students stated that distance learning did not improve their grades compared to if the classes were done in person. The students’ rating of academic progress and success during distance learning significantly vary by college level but not college type as shown in Table 5. The majority of graduate students (41%) agreed that they have learned as much as they learned before the COVID-19 pandemic during in-person classes compared to 27% of students who disagreed or strongly disagreed with the statement. For the undergraduate level, most of the students felt the academic progress and success were negatively affected by the transition to distance learning.

Among the strength of distance learning is the location and time flexibility in class attendance and doing assignments. Students were asked to rate how distance learning has impacted the time they spent completing their assignments. Further, the students were asked if distance learning is effective due to location and time flexibility. The distribution of the results by college level and college type shows that most of the students agreed that distance education offered time and location flexibility. Their responses were in most cases uniform across college level and college type except for location flexibility ($\chi^2 = 34.700, p=0.010$). The flexibility option offered by distance learning was much appreciated by graduate students (84%) compared to undergraduates.

For distance learning to be effective, students need to have essential resources such as reliable internet access and personal computer resources. The results indicated some minor concerns on the issues of internet at home. About 93% of students that were surveyed reported having a computer or a device to use for distance learning. Only 4% of the student indicated that they lacked personal computers with 4% being neutral on the subject. This was a good indicator for an effective distance learning experience despite the concerns that were raised in the area of interaction and collaboration and improvement in academic progress and success.

6.2. Students’ perceptions of instructional methods

The study assessed student’s perception of distance learning instructional methods that were offered by WMU. Instructional methods are the teaching and learning techniques, used by teachers to create learning environments and to specify the nature of the activity in which the teacher and learner will be involved during the education process. Distance education requires different instructor’s efforts, special tools, and teaching methods than those needed in traditional classrooms.

The importance of the instructor in distance learning is growing and should be more intensive to the adaptation of new learning environments. Instructor availability, communication, and feedback are some factors the impact distance learning (Yengin, Karahoca, Karahoca, & Yüce, 2010).
| College of Arts and Sciences | College of Aviation | College of Education and Human Development | College of Engineering and Applied Sciences | College of Fine Arts |
|-----------------------------|-------------------|----------------------------------------|----------------------------------------|-------------------|
| College of Health and Services | Haworth College of Business | College of Arts and Sciences | College of Aviation | College of Education and Human Development |
| College of Engineering and Applied Sciences | College of Fine Arts | College of Health and Services | Graduate College | College of Aviation |
| College of Education and Human Development | College of Aviation | College of Engineering and Applied Sciences | College of Fine Arts | College of Health and Services |
| College of Arts and Sciences | Haworth College of Business | College of Aviation | College of Education and Human Development | College of Engineering and Applied Sciences |
| College of Health and Services | Graduate College | College of Aviation | College of Engineering and Applied Sciences | College of Fine Arts |
| College of Education and Human Development | College of Aviation | College of Engineering and Applied Sciences | College of Fine Arts | College of Health and Services |
| College of Arts and Sciences | Haworth College of Business | College of Aviation | College of Education and Human Development | College of Engineering and Applied Sciences |
| College of Health and Services | Graduate College | College of Aviation | College of Engineering and Applied Sciences | College of Fine Arts |
| College of Education and Human Development | College of Aviation | College of Engineering and Applied Sciences | College of Fine Arts | College of Health and Services |
| College of Arts and Sciences | Haworth College of Business | College of Aviation | College of Education and Human Development | College of Engineering and Applied Sciences |
| College of Health and Services | Graduate College | College of Aviation | College of Engineering and Applied Sciences | College of Fine Arts |
| College of Education and Human Development | College of Aviation | College of Engineering and Applied Sciences | College of Fine Arts | College of Health and Services |
| College of Arts and Sciences | Haworth College of Business | College of Aviation | College of Education and Human Development | College of Engineering and Applied Sciences |
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| College of Education and Human Development | College of Aviation | College of Engineering and Applied Sciences | College of Fine Arts | College of Health and Services |
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| College of Health and Services | Graduate College | College of Aviation | College of Engineering and Applied Sciences | College of Fine Arts |
| College of Education and Human Development | College of Aviation | College of Engineering and Applied Sciences | College of Fine Arts | College of Health and Services |
| College of Arts and Sciences | Haworth College of Business | College of Aviation | College of Education and Human Development | College of Engineering and Applied Sciences |
| College of Health and Services | Graduate College | College of Aviation | College of Engineering and Applied Sciences | College of Fine Arts |
| College of Education and Human Development | College of Aviation | College of Engineering and Applied Sciences | College of Fine Arts | College of Health and Services |
| College of Arts and Sciences | Haworth College of Business | College of Aviation | College of Education and Human Development | College of Engineering and Applied Sciences |
| College of Health and Services | Graduate College | College of Aviation | College of Engineering and Applied Sciences | College of Fine Arts |
| College of Education and Human Development | College of Aviation | College of Engineering and Applied Sciences | College of Fine Arts | College of Health and Services |

Fig. 3. Overall student’s perception of distance learning during the COVID-19 pandemic by college type,
Your instructors have provided you with different ways to demonstrate your learning online. For this statement, 7% strongly disagree, 21% disagree, 25% are neutral, 33% agree, and 13% strongly agree. Another statement is, "Your instructors are available online to you when you need help." 3% strongly disagree, 9% disagree, 21% are neutral, 45% agree, and 22% strongly agree. Your instructor has provided you clear instructions for how to access the online instructional materials for your classes. 5% strongly disagree, 11% disagree, 12% are neutral, 42% agree, and 20% strongly agree. Online contact with your instructor is better than face-to-face. 38% strongly disagree, 32% disagree, 17% are neutral, 15% agree, and 7% strongly agree. Meeting and learning through WebEx, Zoom, and Microsoft365 are effective. 12% strongly disagree, 15% disagree, 27% are neutral, 33% agree, and 13% strongly agree. It is easy to use distance learning tools that WMU’s instructor provides. 8% strongly disagree, 16% disagree, 24% are neutral, 38% agree, and 14% strongly agree. You prefer synchronous online teaching method. (Classes meet exclusively through distance education technologies) 15% strongly disagree, 20% disagree, 26% are neutral, 22% agree, and 17% strongly agree. You prefer in-person or hybrid classes over online classes. 8% strongly disagree, 10% disagree, 13% are neutral, 25% agree, and 45% strongly agree. You prefer asynchronous online teaching method (Require no in-person or synchronous online meetings) 20% strongly disagree, 21% disagree, 17% are neutral, 16% agree, and 26% strongly agree. Online classes are a preferable choice due to COVID-19 crises. 10% strongly disagree, 8% disagree, 14% are neutral, 26% agree, and 42% strongly agree.

| Distance learning tools | College level | College type |
|-------------------------|--------------|--------------|
| **Instruction preferences** | **Instructors** | **Distance learning tools** | **Distance learning methods preferences** | **Chi-Squared test of association students rating of instructional methods with college-level and college type,** <br> <br> Table 6 | **Chi-Squared test of association students rating of instructional methods with college-level and college type,** <br> <br> Table 6 | **Chi-Squared test of association students rating of instructional methods with college-level and college type,** <br> <br> Table 6 | **Chi-Squared test of association students rating of instructional methods with college-level and college type,** <br> <br> Table 6 |
| **Instructors** | Online contact with your instructor is better than face-to-face | 22.857 | 0.026 | 0.126 | 36.103 | 0.283 | 0.159 | 0.017 | 0.189 | 0.017 | 0.189 |
| **Instructors** | Your instructor has provided you clear instructions for how to access the online instructional materials for your classes | 41.765 | 0.003 | 0.170 | 41.380 | 0.124 | 0.170 | 0.017 | 0.189 | 0.017 | 0.189 |
| **Distance learning tools** | Meeting and learning through WebEx, Zoom, and Microsoft365 are effective | 33.900 | 0.027 | 0.153 | 51.197 | 0.017 | 0.189 | 0.017 | 0.189 | 0.017 | 0.189 |
| **Distance learning methods preferences** | You prefer synchronous online teaching method (Classes meet exclusively through distance education technologies) | 37.753 | 0.009 | 0.161 | 38.212 | 0.208 | 0.163 | 0.017 | 0.189 | 0.017 | 0.189 |
| **Distance learning methods preferences** | Online classes are a preferable choice due to COVID-19 crises | 31.626 | 0.047 | 0.148 | 40.776 | 0.137 | 0.169 | 0.017 | 0.189 | 0.017 | 0.189 |
| **Distance learning methods preferences** | You prefer in-person or hybrid classes over online classes | 29.099 | 0.086 | 0.142 | 31.868 | 0.473 | 0.149 | 0.017 | 0.189 | 0.017 | 0.189 |
| **Distance learning methods preferences** | You prefer asynchronous online teaching method (Require no in-person or synchronous online meetings) | 23.473 | 0.266 | 0.127 | 50.764 | 0.019 | 0.188 | 0.017 | 0.189 | 0.017 | 0.189 |

A total of ten questions were asked and grouped into three main groups namely instructors, distance learning tools, and distance learning methods preferences as shown in Fig. 4. The Chi-square test results of students rating of instruction methods by college level and college type presented in Table 6.

For the issues of instructors, the study intent was to discern how students rated the availability of instructors in cases where they needed help, and whether the instructors were able to provide clear guidance to students on how they can access the course material online. The distribution of student’s ratings showed that the student preferred face-to-face meetings that online meetings with the instructors. The results were consistent across college level and college type as shown in Figs. 5 and 6 respectively under the “distance learning methods’ preference” subsection. From Table 6, Significant variation of students’ ratings by college-level was observed when students were asked whether they disagree or disagree about the availability of instructors ($\chi^2 = 41.765$, $p = 0.003$), clear instruction provided by the instructors ($\chi^2 = 33.900$, $p = 0.027$) and methods of assessing students learning ($\chi^2 = 37.753$, $p = 0.009$). In both cases, the graduate students had a higher percentage of agreement with above-mentioned statements as shown in Fig. 5. Significant variation of students’ ratings by college type was observed on the issues of instructors’ availability when students needed help ($\chi^2 = 51.197$, $p = 0.017$). The availability of instructors was highly rated by graduate college followed by the college of health and human services while poor ratings of instructors’ availability were observed in Haworth college of business. The observed variation by college type and college level on the issue of instructor availability offers WMU a clear spectrum of which colleges and students need special attention to improve the effectiveness of distance learning.

The study also examined the efficacy of distance learning tools such as WebEx, and Microsoft team from the students’ perspective. Graduate students’ ratings of these tools were slightly higher than undergraduate level with 61% agreeing that distance learning effective and easy to use (68%) as shown in Fig. 5 under the “distance learning tool” subsection. The undergraduate student’s rating leaned towards disagreement and neutrality. The distribution of ratings by college type showed a poor rating of the distance learning tools by the college of aviation followed by Haworth college of business.

Another interesting subject with was explored in this study was student’s perspective of distance learning methods that were provided by WMU. The methods of learning that were examined include synchronous teaching method, asynchronous teaching method, hybrid
method. Each method has its pros and cons. With synchronous learning methods, students learn and interact with instructors and classmates in real-time while asynchronous learning instructors provide all the necessary material, and students can read and complete assignments and exams in their own schedule. Students were asked to rate each of the above-mentioned learning methods. Students especially freshmen strongly preferred in-person or hybrid classes over online classes ($\chi^2 = 51.197, p=0.017$). Also, there was a consensus among students that online classes were the preferable choice due to the COVID-19 crises. However, there was no apparent preference for the form of distance learning method. About 42% of students prefer asynchronous learning while only 29% of students preferred synchronous learning. The rest of the students either strongly disagree, disagree, or were neutral about the subject.
Fig. 6. Overall student’s perception of instructors and instructions methods during the COVID-19 pandemic by college type.

6.3. Textual exploratory analysis

An open-ended question was asked to students about the best and worse experiences of online learning. The question was specifically designed to discern other important concerns that were not covered in Likert-scale questions. A text mining approach was used to extract information from the students’ opinions. Fig. 7 shows the word network diagram showing the keywords that were used by students to articulate their experience of distance learning. Each word has been reduced to its root form through the process known as stemming. The most fre-
quent pairs of words for the best experience of distance learning are “flexible location”, “flexible schedule”, “social distance”, “park pass”, among others. The most frequent pair of words that were used to describe the worse experience of distance learning include “human interact”, “due date”, “distance learn”, “real-time” and “class synchron”. The main themes that were prevalent in students’ comments about the worse distance learning experience are lack of human interaction, social connections, self-motivation, and concentration. Also, technological glitches such poor internet connections and students’ or instructors’ inexperience using online systems were mentioned by students.

7. Discussion

The results of this study are indicative of less positive perceptions of distance learning across college level and college type. Positive attitudes and a high level of satisfaction among all students are what designers and instructors of distance learning need to achieve. The results could provide a useful understanding of what brings about less positive student perceptions of distance learning. For instance, the less positive perceptions may be related to the type of distance learning methods or tools, or they could be linked to other different factors such as college level, college type, previous distance learning experience, and interaction with instructors and classmates. In this study, we found both the college level and college type significantly impacted students’ perceptions of distance learning on the seven defined scales. These two factors influence students’ perceptions and attitudes toward distance learning. Furthermore, all the participants were actively enrolled in a distance learning class at the time when they reported their perceptions, and that may have influenced their overall negative perception of distance learning.

The findings of the study that relate to the influence of college-level showed that most freshmen perceived a lack of interaction among students and instructors as the result of shifting to distance education during the pandemic. The effect was less severe to higher college level, especially graduate students. In the area of improvement in academic progress and success, most of the undergraduate students reported a more negative view than the graduate students. The undergraduate students’ academic progress and success were negatively affected by the transition to distance learning in terms of the extent to which: distance learning did not improve on-campus classes or instructions, students did not learn as much as they would have learned in in-person classes, distance learning did not improve their grades compared if the classes were done in-person. The impediment to academic progress brought by the pandemic has also been reported elsewhere in high education institutions (Kummitha, Kolloju, Chittoor, & Madepalli, 2021; Pokhrel & Chhetri, 2021). Much of it has been attributed to a lack of institutional preparedness to cope with the unprecedented pandemic. Also, due to the lack of best of available information on best practices (Armstrong-Mensah, Ramsey-White, Yankey, & Self-Brown, 2020) an almost trial and error process of gauging and supporting students has been reported during the pandemic deterred the overall academic performance and progress.

On the other hand, students across the college level reported positive perceptions about the location and time flexibility of distance learning in class attendance and doing assignments. Specifically, distance learning flexibility was much appreciated by graduate students compared to undergraduates. The benefits of distance learning in terms of location and time flexibility have been widely reported in most of the Covid-19 related papers. The benefits include but are not limited to less commuting time, savings on gas, time management, and more time to spend with family members (Almaiah, Al-Khasawneh, & Al-thunibat, 2020; Armstrong-Mensah et al., 2020). Increased flexibility has also been shown to enable independent learning among students (Müller, Goh, Lim, & Gao, 2021).

In terms of reliable distance learning resources, most of the students reported having internet access and a computer or a device to use for distance learning. Only a small number of the students indicated that they lacked personal computers. Similar results were obtained by Armstrong-Mensah (2020) with the majority of students at Georgia State University reported having internet access and digital devices which support distance learning. However, other studies have reported the disparity in digital tools and internet access among students (Coello, Salazar, & Taborda, 2020) Equitable access to the internet and other supporting tools is of paramount importance to students enrolled in distance learning. Each institution should aim at setting out measures that ensure the pandemic does not widen the digital divide between students. The finding that all the students reported a highly positive perception of the face-to-face meeting with instructors’ subscale is an important one that the instructors of distance learning classes need to consider. Similarly, a positive perception was reported by college levels in terms of the availability of instructors, clear instruction provided by the instructors, and methods of assessing students learning. The study also tested the efficiency of distance learning tools such as WebEx and Microsoft teams from the students’ perspective. Graduate students reported high positive perception than undergraduate students on using and learning through these tools. The perception and acceptance of distance learning tools can be enhanced by training educators and students on the use of digital technology which has now become an integral part of higher education.
The findings of students’ perspective of distance learning methods that were provided by WMU showed that most of the students, especially the freshman reported a highly positive perception of preferring in-person or hybrid classes over online classes. The preference for hybrid or blended classes has also been reported elsewhere among educators and students (Müller et al., 2021). It has been shown to provide a better understanding of the courses due to an increase in social interaction among peers and instructors (Kimkong & Koemhong, 2020). In the meantime, most of the students, especially the graduate students, reported a positive perception of the preference for online classes due to the COVID-19 crisis. However, there was no apparent preference for the form of distance learning method. Seniors and juniors reported more negative perceptions of the synchronous learning method than other college levels, while freshmen reported a highly negative perception of the asynchronous learning method than other students. Synchronous learning has been reported in previous studies to improve instructor-teacher interaction. A study by Müller et al. (2021) reported an increased level of engagement among students in distance learning who were normally quiet during in-person classes. A continuous assessment of student readiness to various forms of online learning is needed based on equipment capability, technology skills, self-directed learning, motivation, and perceived usefulness (Widodo, 2020).

The findings of the study that rely on the influence of college type showed that the interaction with classmates was poorly rated by all colleges. However, the College of Aviation and College of Fine Arts reported a highly negative perspective comparing to other colleges. On the distance learning flexibility scale, most of the colleges, especially Haworth College of Business, positively rated the statement: “distance learning causes spending more time doing your work.” A highly positive rating on having internet access at home was reported by the College of Health and Human Services, followed by the College of Fine Arts. In addition, the availability of instructors was highly rated by Graduate College followed by College of Health and Human Services, while poor ratings of instructors’ availability were observed in Haworth College of Business. The issue of instructor availability offers WMU a clear spectrum of which college and students that need special attention to improve the effectiveness of distance learning. Conclusively, the distance learning tools were negatively rated by the College of Aviation followed by Haworth College of Business. The observed disparity in distance learning rating across college types emphasizes the key challenge of distance learning which is to create a holistic and inclusive learning experience that suffices the diverse student needs. These findings tend to vary mostly by college type or nature of the subjects (Kimkong & Koemhong, 2020; Müller et al., 2021).

8. Conclusions

In just a few months, The COVID-19 pandemic, caused by the latest coronavirus, resulted in the sudden closure of the universities globally and moved face-to-face classes to distance or online learning, which changed the lives of masses across the globe, including higher education students. In this respect, we introduce this study to reveal students’ perspectives and understand their preferences and needs on distance learning at Western Michigan University (WMU). All students in all different colleges and departments were invited to participate in this study. The findings have important implications for distance learning educators and may help the top management of the university to assess distance learning and make future decisions to enhance the weakness of this type of learning.

Considering the present study, the findings could be split into instructor factors that influenced the experience and student factors that influenced the experience. The instructors need to implement strategies that are influenced by the college’s level and type to address students’ needs for better instructions, a proper teaching method, a suitable grading schema to assess student work and comprehension, face-to-face interaction, small group discussion, collaborative projects, and group presentation. These strategies may help boost students’ achievement and overcome their difficulties with distance learning.

On the student side, the capacity to adjust to school and life, acceptance of personal responsibility, connection with peers, and time management skills are the most factors that influenced the student’s experience.

Future studies could examine perceptions of distance learning at the departmental level. Generally, the findings and discussion of this study have important implications for future research. As the survey for this study was done during the pandemic’s initial period, the finding is essential and points to the overall higher levels of awareness and comfortability with the distance learning among the students in general. So, studies could be established to determine whether WMU students’ perceptions of distance learning are affected by the impact of previous enrollment in distance learning courses comparing to the current study results. Finally, further research could be examined how students’ perceptions will change over academic years.

Conflict of Interest

None.

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