Exploring Trends of Potential User Experience of Online Classroom on Virtual Platform for Higher Education during COVID-19 Epidemic: A Case in China

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Abstract—Affected by the epidemic, the utilization rate of online education platforms has risen sharply. The change of teaching mode not only provides more opportunities for online education, but also brings more challenges to users of the platforms. The method to solve the difference in experience brought by the transition from offline education to online education, to help students improve their sense of learning, and to reduce the confusion and discomfort caused by online learning are the problems facing online education platforms at this moment. Hence, this study aims to explore the potential user requirements of online scene experience by the use of a questionnaire survey associated with text and images. Taking a class of industrial design students as the sample for investigation on four scenes, such as a scene of offline social communication environment, a scene of effective interaction, a scene of learning environment, and a scene of supporting physical movement, which the online platform can bring users with pleasure and comfort as offline.

Keywords—covid-19 epidemic, online classroom, virtual platform, user experience, offline classroom experience, higher education

I. INTRODUCTION

Affected by Covid-19 epidemic, the utilization rate of online education platforms has risen significantly, as such platforms and users face more challenges [1-2]. In order to better meet needs of users, existing platforms mainly focus on cross-regional sharing of knowledge and effective utilization of data resources [3][6], online courses and interactive live streaming that feedback situation of students to teachers effectively [4][6], interactive drawing board and screen sharing to restore the offline classroom as much as possible [4-6], increasing social platforms and educational platforms with high social attributes [6], developing more technical aspects of the platform [7], and platform teaching mode and learning process that are optimized to improve learning efficiency [3][6]. It can be found that the platforms are designed for meeting needs of users in terms of online functions to achieve better learning effects by using the platform.

However, a number of recent survey results show that students do not have a high sense of learning on online platforms, and some online learning become a mere f ormality. Among the factors affecting learning efficiency of students, influences from platform account for a definite proportion [1]. Moreover, among the survey of students, most of them believe that online teaching is not as effective as offline face-to-face teaching.

The reason for this phenomenon is that the analysis of offline and online experience are not taken into account, and the platforms ignore the experience diversity brought by difference of online and offline. Under the severe situation of the global epidemic, the external environment would also affect the psychological behavior of students causing anxiety and depression [9], and psychological phenomena such as study pressure and weariness [10]. Therefore, the diversified learning functions of the platform are ineffectively to address the satisfaction of students during the present period. Therefore, this study aims to explore the trends of potential user requirements of online scene experience by the use of a questionnaire survey associated with text and images.

II. RESEARCH METHOD

The survey used online questionnaire to explore the potential needs of users for scene experience. In view of the principle of sample convenience, the samples of this survey were taken from university students who major in industrial design. 20 questionnaires were sent out and 13 responses were received. The collected views are all from the students who possess sense of design experience and design thought, thus the reference value of questionnaire is higher.

The questionnaire survey associated with text and images, which increased scene experience and empathy of participants to collect more effective responses. The questions in the questionnaire were divided into four levels: 1.Very bad 2.Bad 3.Good 4.Very good, etc., in order to get more details about opinions of participanting students on each question, as shown in Fig. 1. This questionnaire is published on WeChat app, fun questionnaire platform.

III. RESULT

A. Holistic Feeling of Online Classes

The questionnaire participants were asked to make a preliminary evaluation of the online classroom. It can be seen from Fig. 2 that the majority of participants (69%) indicated that the holistic feeling of online classes was good, and high evaluations were given by minority (8%). However, nearly a third (31%) of the participants gave low ratings and none (0%) of them gave poor evaluations.

B. Holistic Feeling of Online Classes

The questionnaire participants were asked to appraise the freedom of online classes. As shown in Fig. 3, the most (62% good, 15% very good) participants agree with the great freedom on the Internet. The minority (23%) hold the opposite view.

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15.If the network platform opens the group mode for you, voice or video, restore your own small topic circle in offline. What do you think of that?

A.Very bad
B.Bad
C.Good
D.Very good

16.If the network classroom has a visual space, there are classroom with desk and chairs. You can see your classmates sitting around you and you can switch BGM (background music) in your own space. What do you think of that?

A.Very bad
B.Bad
C.Good
D.Very good

17.Do you have any new ideas for online class?

Fig. 1. The questionnaire for exploring the potential user requirements of online scene experience, based on views of students (devised by author).

The questionnaire participants were asked to give their own opinions on the free space and free time of online classes. There were eight participating students providing their opinions. As shown in Table I, five participants believed that the advantage of freedom in online classes is that students have more initiative to control their time, while the disadvantage of freedom that was offered by three students is that students with weak self-control can not effectively complete their study plans.

What about your feeling of online class?

- Very bad
- Bad
- Good
- Very good

8% 0%
31%
61%
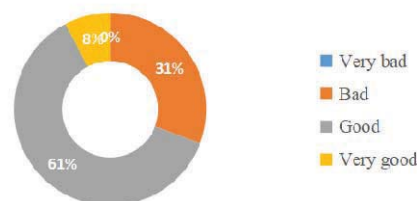
Fig. 2. Holistic feeling and evaluation of online classes (responding students' views).

What do you think of online courses that can give you more freedom and space to control your own life (study or entertainment)?

- Very bad
- Bad
- Good
- Very good

15% 0%
23%
62%

Fig. 3. Evaluation of freedom in online classes (responding students' views).

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Issues	Aspects of opinions	Number of mentions
Positive comment on the freedom of online classes	Having more time at own disposal.	5
Negative comment on the freedom of online classes	Too much freedom and lack of self-control.	3

C. Views on Previous School Life

The questionnaire participants were asked to review their life on campus. It can be seen from Fig. 4 that two-fifths (39%) of participants miss the school days very much and around half (46%) of them miss days in school, while less than a fifth (15%) of the participating students indicated that they do not miss school life at all.

Fig. 4. Missing school days or not (responding students' views).

The questionnaire participants were asked to reply to their views and explanations on school life. There were eight participating students providing their opinions. The results are shown in Table II, five students yearn for offline interaction and communication. The other part of the reason is out of physical health, two students believed that they have more opportunities to exercise at school. One participant who do not miss school thought that it is more comfortable to study at home.
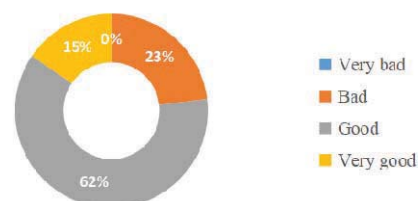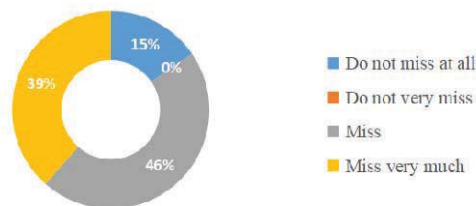
TABLE II. VIEWS ON SCHOOL DAYS (RESPONDING STUDENTS' VIEWS)

Issues	Aspects of opinions	Number of mentions
Miss school life	Expect to socialize and feel alone.	3
	Missing the environment of staying with teachers and classmates.	2
	Having chance to exercise, not stay at home every day motionless.	1
	Watching computer for a long time makes my eyes uncomfortable.	1
Do not miss school	It's more comfortable at home.	1

D. Expectations for Offline School Physical Environment

The questionnaire participants were asked to review the physical offline environment of learning on campus. As shown in Fig. 5, the majority of participating students expect the physical learning environment of the school. Among them, more half (54%) of students expect it, less than a fifth (15%) of them expect it very much. Nearly one third (31%)of participants don't expect it, and the minority (8%) of them don't expect it at all.
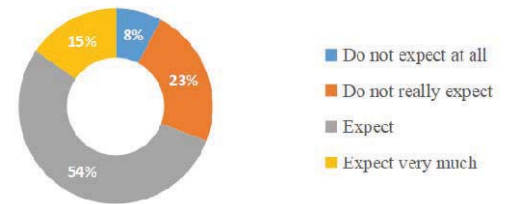
Fig. 5. Expectations for the school environment (responding students' views).

E. Feelings on Learning Scenes in Online Classes without the Company of Classmates

The questionnaire participants were asked to report how frustrated they were in the online class without the company of classmates. It can be seen from Fig. 6 that overwhelming proportion of the participants are not pleasure (62% frustrated, 15% very frustrated), while close to a quarter of participating students indicated that they are not upset.

F. Degree of Anxiety about the Lack of Learning Atmosphere in Online Classes

The questionnaire participants were asked to choose the level of anxiety caused by the lack of a learning environment. As shown in Fig. 7, the proportion of participants who feel anxious is more than half (38% anxious, 15% very anxious) and show that paying more attention to study will have higher anxiety level. While less than half of them have lower anxiety level, two-fifth of the students are not very anxious and the minority (8%) are not anxious.

Fig. 6. Degree of frustration with learning scenes in online classes without the company of classmates (responding students' views).

Fig. 7. Degree of anxiety caused by lack of learning atmosphere (responding students' views).

G. Degree of Integration into Online Classroom Scenes

The questionnaire participants were asked to think the degree of integration into online classes. According to Fig. 8, A quarter (23%) of the parti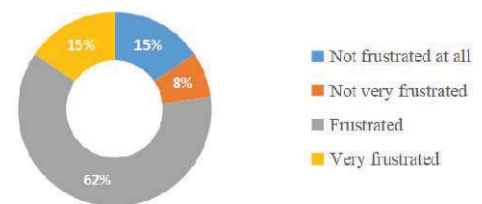cipants believed that they could not integrate into the class at all. The lower level accounts for two-thirds (62%) proportion and the higher level covers around one fifth of (15%) proportion. However, none (9%) of the students thought they would be able to participate entirely in the online classes.
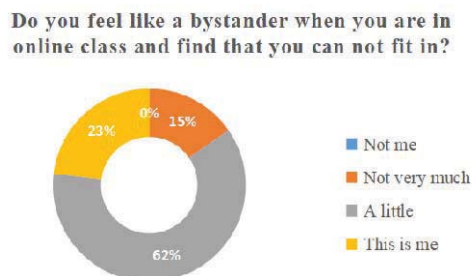

Fig. 8. Degree of integration into online classroom scenes (responding students' views).

H. Willingness to Interact in Online Classes

The questionnaire participants were asked to report their willingness of interaction in online classes. As shown in Fig. 9, the proportion of participants who are willing to interact is close to half (31% willing, 23% very willing). while two-fifth (38%) of participating students are not very willing to interact, and the minority (8%) are not willing to interact at all.
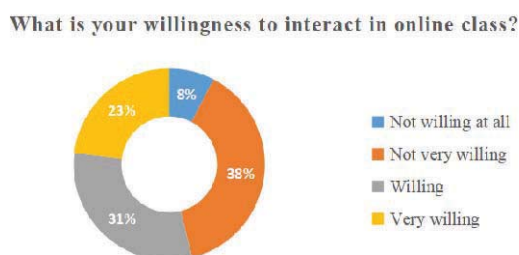

Fig. 9. Degree of willingness to interact in online classes (responding students' views).

The questionnaire participants were asked to give examples of their preferred ways of interacting. There were six participating students providing their opinions. The results are shown in Table III. Participants are divided into active interaction and passive interaction. Four participants are more inclined to interact with interesting and direct ways, while two participating students are more inclined to interact with evasive and indirect ways.

TABLE III.   DEGREE OF WILLINGNESS TO INTERACT IN ONLINE CLASSES (RESPONDING STUDENTS' VIEWS).

Issues	Aspects of opinions	Number of mentions
Preferred way to interact	Bullet screen.	2
	Face-to-face communication.	2
	Live streaming small gifts.	1
	Typing.	1
	Teacher actively interacts and students passively accept.	1

I. How Much do Students Care about Online Classroom Performance

The questionnaire participants were asked to think about how much they care about their online performance. As shown in Fig. 10, more than half (69%) of the participating students indicated that they don't really care about their performance. However, there are a fifth of (23%) the students care a lot and less than one-tenth (8%) of them indicated that they care their performance.
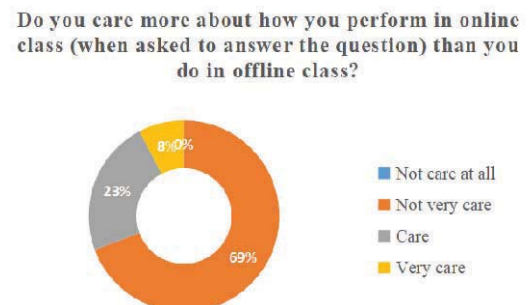

Fig. 10. Degree of concern about online classroom performance (responding students' views).

The questionnaire participants were asked to explain how much they cared about online classroom performance. There were six participating students providing their opinions. As shown in Table IV, there are four students reported that they do not care because classroom communication is not face-to-face, and some others say they do not care about their performance in either online or offline classes. Two participants who indicated they care about classroom performance thought it would be embarrassing to fail to answer questions in online class.

TABLE IV.   DEGREE OF CONCERN ABOUT ONLINE CLASSROOM PERFORMANCE (RESPONDING STUDENTS' VIEWS).

Issues	Aspects of opinions	Number of mentions
Do not care about performance in online classes	Do not be nervous if can not be seen.	2
	Do not care about performance.	2
Care about performance in online classes	It is awkward that not being able to answer the question.	2

J. Differences between Online Class and Offline Class

The questionnaire participants were asked to talk about their own opinion about the difference between online class and offline class. There were 11 participating students providing their opinions. It can be seen from Table V that most participants believed that comparing with offline classes, online classes lack the learning environment, have low interactive efficiency and need students to keep high self-consciousness, which is more challenging for practical courses.

TABLE V.   DIFFERENCES BETWEEN ONLINE AND OFFLINE CLASSES (RESPONDING STUDENTS' VIEWS).

Issues	Aspects of opinions	Number of mentions
The difference between online and offline classes	Online class needs more self-awareness and focus ability.	4
	Offline interaction is better than online.	4

Issues	Aspects of opinions	Number of mentions
	Lack of learning environment.	2
	Theoretical courses have advantages in online class, but practical courses are at a disadvantage.	1

K. Restore Offline Group Topics in Online Class

The questionnaire participants were asked to imagine that online classes could restore the offline group topic circle and provide their perspective. As shown in Fig. 11, majority (69%) of participants thought this plan is good, around a quarter (23%) of them do not approve it, and the minority (8%) that the plan cannot be accepted.
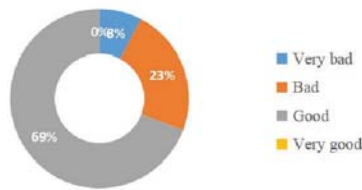
Fig. 11. Degree of willingness of online class about restoring offline group topic circle (responding students' views).

L. Visual Space in Online Classroom

The questionnaire participants were asked to report their comments on the scheme of increasing visual space in online classes. It can be seen from Fig.12 that the overwhelming number (69%) of participants believed that they accept the program, close to a quarter (23%) of participants gave excellent evaluation. While a quarter (23%) of them indicated that the program is bad, and minority (8%) can not accept it.
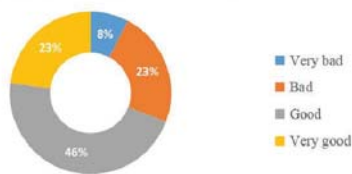
Fig. 12. Evaluation of the plan to increase visual space in online classes (responding students' views).

M. Other Ideas for the Online Classroom

The questionnaire participants were asked to propose other ideas for online classes. There were three participating students providing their opinions. The results are shown in Table VI. Participants indicated that they prefer to build more connections with peers and teachers.

TABLE VI. OTHER THOUGHTS ON ONLINE CLASSES (RESPONDING STUDENTS' VIEWS).

Issues	Aspects of opinions	Number of mentions
Other ideas	The online course can be divided into groups at random, with tasks left in	1

Issues	Aspects of opinions	Number of mentions
	the group and face to face, and add some interest.	
	Increase the random lottery links, so that the class becomes tense and exciting.	1
	Share the screen, study and play together.	1

IV. DISCUSSION AND CONCLUSION

The survey results, summarized as in Fig. 13, show one of the most significant is the majority (84.7%) participating students yearning the normal day of school. Overwhelming (84.6%) participants indicate the online classes of low level of class participation causing boring. There is a lack of companions in online classes environment resulting in lonely by three-quarters (76.9%) of the students. Close to seven in ten (69.2%) of them are keen to participate in the original offline classroom environment. In addition, more than half (53.9%) of the students put forward their wishes that they could get better interactions, and they are anxious about their studies at home. Hence, it can be found that environment of class have changed on four aspects: the change in emotional need, the change in classroom environment, the change in communication, and the change in the physical requirement. These lead to the final four scenes:a scene of offline social communication environment, a scene of effective interaction, a scene of learning environment, and a scene of supporting physical movement, which are shown in Fig. 14.

Moreover, the survey results indicate that online classes are short of learning environment, which impact on experience of students. This part of the conclusion is consistent with the investigation results of Wu et. al [1] that the use efficiency of online platform is affected by classroom environment. There are a large proportion (69.08%) of college students who think that their focus is always taken away from the classroom, and more than half (56.37%) of the students think that online education efficiency is not high like what they expect.

The survey about interaction of scene experience concludes that students prefer unencumbered communication with classmates which the original offline classroom interaction support. The same conclusion from study of Lobel [11], comparing online and offline interactive collaboration environment of students, indicates that group interaction rate of students is higher than the students in the interaction between the teacher ratio, the survey of McCarthy [12] indicates that students tend to group interaction and peer interaction.

Furthermore, the social communication scene explores the psychological state and emotional needs of students during COVID-19, and helps users deal with the discomfort and loneliness caused by converting from offline to online classes. The studies of Bandias [13] and Ananthanarayanan [14] confirm the necessity and value of social communication scene of online platform, whereas the distinction from this study is that their studies indicate that social communication environment of online platform is an effective method to improve students' learning ability.

The research has limitations, as a preliminary exploration of potential user experience of online live streaming education platform under COVID-19. To collect more effective responses, questionnaire increased scene experience

and empathy of participants by the use of visual interactive images. But the sample is only a small portion for industrial design students who possess sense of design experience and design thought. The direction of exploration is mainly the experience scene of online classroom, and it does not discuss the function of online platform. Therefore, the type and number of research samples will be expanded in the later stage to make a more comprehensive survey about online education platforms.
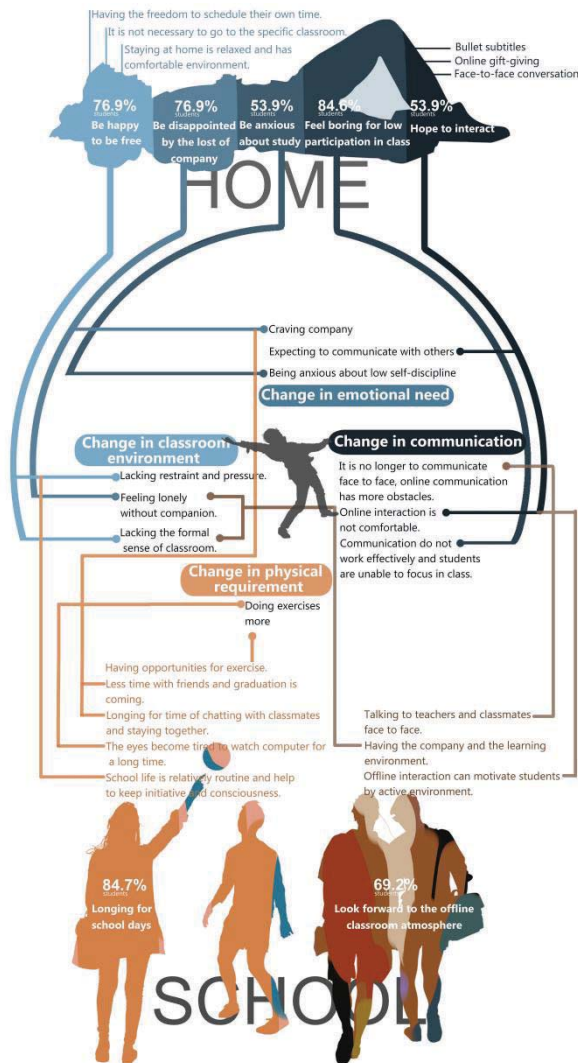

Fig. 13. User experience of online classroom on virtual platform for higher education based on responding students' views.

Fig. 14. Trends on user experience of online classroom on virtual platform for higher education based on responding students' views.

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