Evaluating UI/UX Online Courses : A Case Study Of Software Engineering Students' Learning Experience

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ABSTRACT

With technology advancing quickly in today's world, education has become one of the significantly affected aspects. Technological progress facilitated access to educational materials, leading to the emergence of various new learning methods, including online courses. Online courses were widely favoured due to the customization and diverse variations of their learning materials. Visual design, user interface (UI), and user experience (UX) played a crucial role in attracting interest in learning, as evidenced by increased engagement among users of online courses with appealing designs. These critical UI/UX aspects provided a specific boost in understanding and exploring this field, as reflected in the provision of UI/UX materials on online course platforms. This study utilized the User Experience Questionnaire (UEQ) method to evaluate the satisfaction and experiences of students participating in UI/UX online courses across six aspects: Attractiveness, Efficiency, Perspicuity, Dependability, Stimulation, and Novelty. The study involved 41 students who took UI/UX online courses for one month. The results indicated a high level of satisfaction across these aspects, suggesting that UI/UX online courses could be considered effective and reliable methods for understanding and exploring this field.

1. INTRODUCTION

The advancement of technology is inevitable, as it is closely linked with scientific advancement (Jamun, 2018). Not to mention the world of education itself, there are many innovation options available in learning methods. Online learning has become a branch of innovation that is quite popular, this is because online learning offers convenience, flexibility, and personalized learning experiences, allowing teachers to monitor student progress and give feedback effectively (Yuhanna et al., 2020). One popular form of online learning is online courses, which are claimed to offer many benefits, especially in terms of material effectiveness and affordability (Castro et al., 2021).

Students can easily customize their learning methods based on the provided materials, which is advantageous as they can choose what topics to delve into, when to study, and their own

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learning styles (Li, 2022). The visually appealing interface has a positive impact on enhancing someone's learning experience (Katona et al., 2023). With an engaging user interface (UI) and a good user experience (UX) in online UI/UX courses, students are more likely to be interested and inspired to explore further the UI/UX-related learning materials. With this trend, learning platforms promptly provide UI/UX materials, enabling students to learn whenever they want. This demonstrates the importance of engaging user interfaces (UI) and user experiences (UX) in online courses, which directly influence students' interest and participation in UI/UX learning materials. The ease of access in learning via online courses is what makes it one of the reliable models of education (Fauzi et al., 2021). With its accessibility, students can conveniently engage with course materials and resources anytime and anywhere, contributing to its appeal and effectiveness as a learning platform. Indeed, this greatly facilitates someone who may have difficulty accessing conventional education.

However, online courses come with their own set of challenges. Students with better devices and internet access are at an advantage, as they can navigate the course materials more smoothly and may experience better comprehension and satisfaction (Kumar, 2015). Moreover, when learning UI/UX design, having a capable device is crucial for accurately perceiving colors and facilitating the design process. This point can be one of the weaknesses of online courses, as in conventional education, students can access supporting resources such as well-equipped laboratories. Additionally, the lack of interaction with others can be an obstacle for users. For students undertaking online courses independently, it can be quite challenging to receive feedback, collaborate, and even understand the material. Additionally, this may lead individuals to solve problems on their own more frequently in front of the screen, whereas the presence of direct interaction can help maintain one's motivation in learning (Tenenbaum et al., 2019). Furthermore, spending extended periods of time in front of a screen can lead to various health issues (Pandika, 2016), making it a significant consideration when opting for online courses.

Given the positive and negative aspects of online courses, this study aims to explore the experiences and satisfaction levels of Software Engineering students, whose primary learning focus revolves around providing an interesting experience for users in using technology, as they engage in UI/UX courses as supplementary online courses to sharpen their skills. While previous study has focused on experiences and satisfaction during the Covid-19 pandemic (Li, 2022), where online courses were the main alternative, this study focuses on the current situation, where things have returned to normal and online courses are only a secondary option. The study explores students' experiences and satisfaction without considering previously identified benefits and challenges during pandemic.

2. METHOD

The study used the User Experience Questionnaire (UEQ), which assessed user satisfaction with a product using various benchmarks (Schrepp et al., 2017). Findings from this study could provide recommendations to instructors for creating more varied learning environments, with the UEQ serving as a valuable tool to gather data about students' satisfaction and experience levels in taking online courses.

2.1 Data Collections, Procedure, and Populations

In this study, the respondents consisted of 41 participants from the College of Vocational Studies of IPB University majoring in Software Engineering. They were chosen based on their active participation in a one-month online UI/UX course, such as MySkill, BuildWithAngga, Kelas.work, etc., which took place in February 2024, aimed at enhancing their skills. The questionnaire was distributed via WhatsApp in March, following the completion of the one-month course by the students during February, to gather feedback and provide insights into the learning experiences of the participants.

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2.2 Data Analysis

Questionnaires are frequently used as tools to evaluate software quality and usability from the user's perspective. One popular example is the User Experience Questionnaire (UEQ), which is designed to measure the User Experience of interactive products.

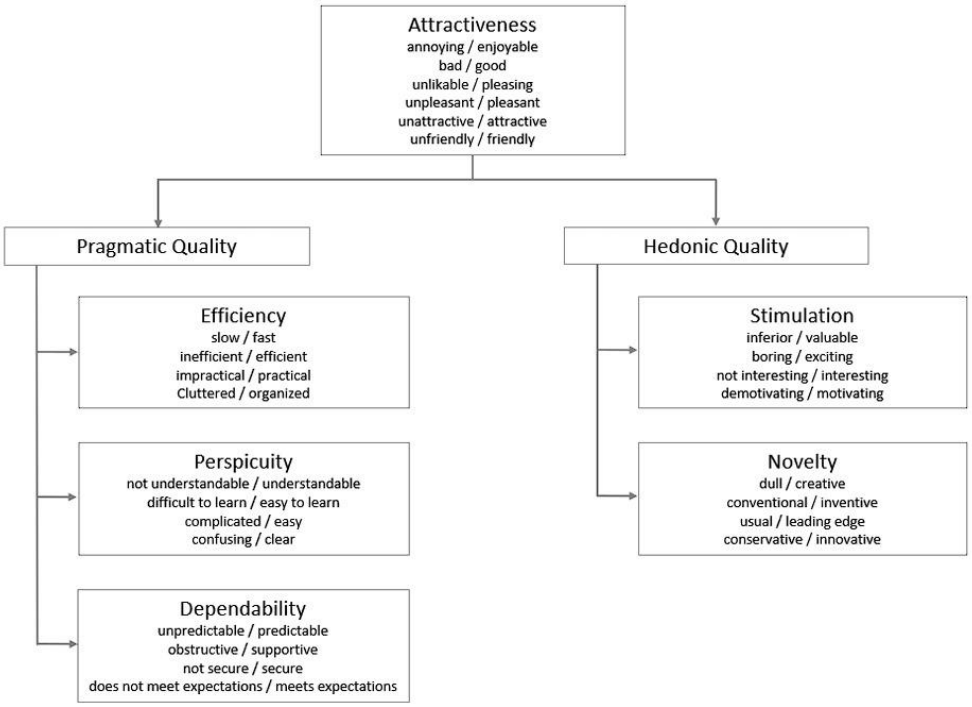

Figure 1. UEQ Items

The instrument utilized in this study was the UEQ (User Experience Questionnaire); hence, data analysis was conducted using the UEQ Data Analysis Tools, a tool provided by UEQ itself. As shown in Figure 1, there were 26 items discussed across 6 categories: Attractiveness, Efficiency, Perspicuity, Dependability, Stimulation, and Novelty. Furthermore, questions were included to confirm that respondents were indeed students from Software Engineering. Respondents were also encouraged to share their impressions of the courses they had taken.

3. RESULTS AND ANALYSIS

The results of the UEQ evaluation of UI/UX online courses comprised 26 items distributed across 6 scales. These scales include attractive, perspicuity, novelty, stimulation, dependability, and efficiency (Saleh et al., 2022). This comprehensive assessment provides valuable insights into the overall user experience of the online courses, offering a detailed understanding of their attractiveness, clarity, innovativeness, engagement, reliability, and efficiency.

Table 1. The UEQ Scale Structure

Item	Scale	Left	Right	Mean	Variance	Std. Dev.
1	Attractiveness	Annoying	Enjoyable	1,7	1,3	1,1

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Item	Scale	Left	Right	Mean	Variance	Std. Dev.
2	Perspicuity	Not understandable	Understandable	2,1	1,0	1,0
3	Novelty	Creative	Dull	1,7	1,9	1,4
4	Perspicuity	Easy to learn	Difficult to learn	1,7	2,5	1,6
5	Stimulation	Valuable	Inferior	2,0	1,8	1,3
6	Stimulation	Boring	Exciting	1,4	2,1	1,4
7	Stimulation	Not interesting	Interesting	1,9	1,7	1,3
8	Dependability	Unpredictable	Predictable	2,2	0,6	0,8
9	Efficiency	Fast	Slow	1,6	2,7	1,6
10	Novelty	Inventive	Conventional	1,2	1,6	1,3
11	Dependability	Obstructive	Supportive	2,2	0,7	0,9
12	Attractiveness	Good	Bad	2,3	1,3	1,1
13	Perspicuity	Complicated	Easy	2,4	0,7	0,9
14	Attractiveness	Unlikable	Pleasing	2,1	1,2	1,1
15	Novelty	Usual	Leading edge	1,4	1,5	1,2
16	Attractiveness	Unpleasant	Pleasant	1,8	1,8	1,4
17	Dependability	Secure	Not secure	1,6	1,3	1,1
18	Stimulation	Motivating	Demotivating	2,1	1,1	1,1
19	Dependability	Meets expectations	Does not meet expectations	1,9	1,5	1,2
20	Efficiency	Inefficient	Efficient	1,5	1,5	1,2
21	Perspicuity	Clear	Confusing	2,4	0,7	0,8
22	Efficiency	Impractical	Practical	2,2	0,7	0,9
23	Efficiency	Organized	Cluttered	2,1	1,3	1,1
24	Attractiveness	Attractive	Unattractive	1,9	1,7	1,3
25	Attractiveness	Friendly	Unfriendly	1,8	1,8	1,4
26	Novelty	Conservative	Innovative	1,6	1,3	1,1

Table 1 shows the scales, mean, variance, and standard deviation for each item. The scale range falls between -3 (horribly bad) and +3 (extremely good). Closer proximity to -3 indicates increasingly bad results, while moving away from it indicates improvement. Based on the mean results of the 26 items, all fall within the range of +1 to +3, indicating positive responses from the respondents. Out of these 26 items, 10 items have means above +2, there are items number 2 (perspicuity), number 8 (dependability), number 11 (dependability), number 12 (attractiveness), number 13 (perspicuity), number 14 (attractiveness), number 18 (stimulation), number 21 (perspicuity), number 22 (efficiency), and number 23 (efficiency).

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The most important indices that affect the user experience of the online live course platform are ease of operation and quickness (Wang et al., 2021). Five out of six scales are incorporated in questions with responses approaching +3 (extremely good), indicating that respondents have provided highly positive feedback on the UI/UX online course. In line with previous studies, the perspicuity scale consistently scores above +2 across three distinct question items. For detailed averages, refer to Figure 2.

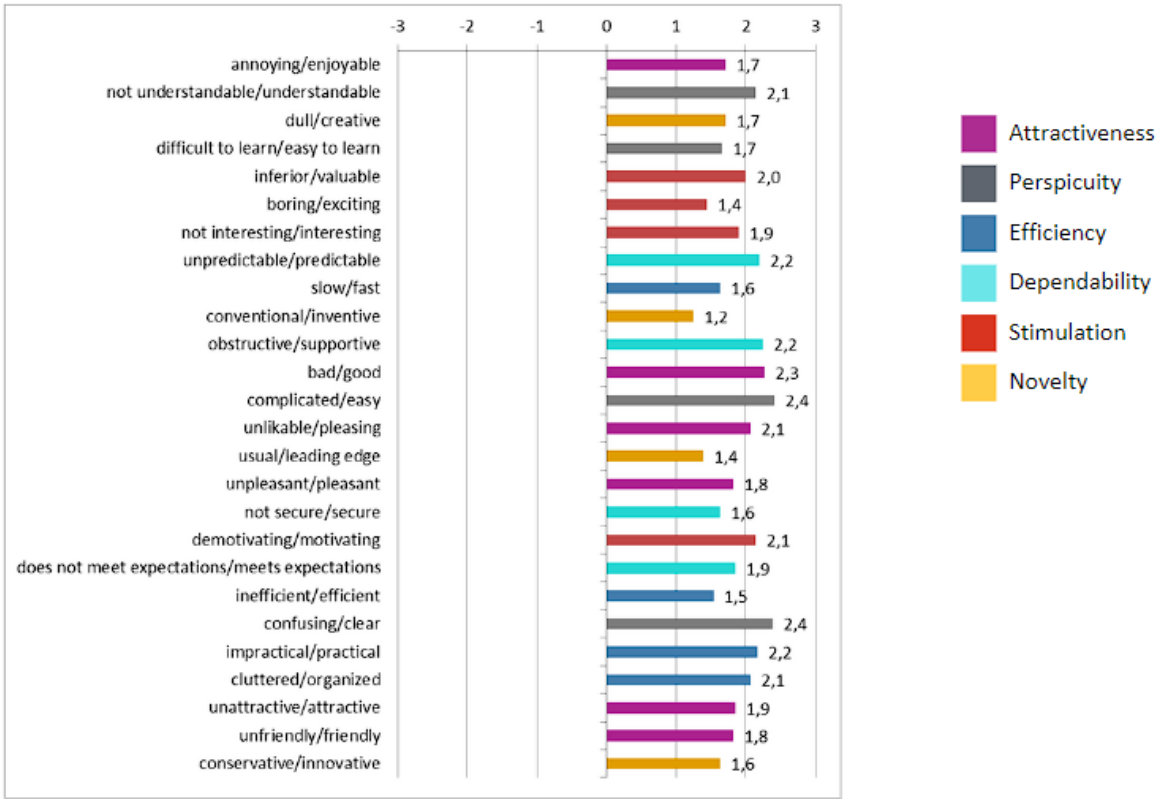

Figure 2. Mean Value per Item

Figure 2 will depict the mean value per item. Further analysis reveals that the items with the highest mean, reaching 2,4 are in the perspicuity scale, specifically items number 13 and number 21. From these results, respondents perceive the UI/UX online course to possess a comprehensible structure, user-friendly navigation, and clear instructional guidance. This alignment underscores a positive evaluation of the platform's design and functionality by users, reflecting an effective implementation of intuitive design principles and clear communication within the course interface.

On the other hand, the lowest mean score, at 1,2 is observed in the novelty scale, particularly in item number 10. While the lowest mean doesn't necessarily signify a negative sentiment, as it still falls within the range of +1 to +3, it does suggest that respondents no longer view the online course's UI/UX as novel or innovative. This indicates a shift in perception among users, implying that the novelty factor initially associated with the course's design or features may have diminished over time. It could be inferred that users may now perceive the course as less innovative or groundbreaking compared to when they first encountered it.

This decline in novelty perception can be addressed by the pedagogical strategy of 'less is more' is employed to decrease cognitive load, emphasizing to students the ease of accessing

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materials in concise, digestible segments, which forms the core of the research design approach (Jomah et al., 2016). The primary element of importance is to ensure that students can readily perceive that the material in their course can be easily viewed, listened to, and read in bite-sized segments (by delivering several micro-lectures lasting 7 to 15 minutes per week and minimizing all other content as much as possible). This approach aims to stimulate enthusiasm and interest in upcoming concepts, readings, and learning materials (Kossen et al., 2021).

Thus, from Figure 2, it is known that perspicuity scale has the highest mean score, while novelty scale has the lowest mean score in measuring respondents' responses to the online UI/UX course experience. To facilitate the viewing of the mean results of other scales, Table 2 will display each average according to its classification.

Table 2. UX Scales

UEQ Scales	Mean	Percentage
Attractiveness	1,9	63,3%
Perspicuity	2,2	73,3%
Efficiency	1,9	63,3%
Dependability	2,0	66,7%
Stimulation	1,9	63,3%
Novelty	1,5	50%

Table 2 display the mean according to scale classification as a representation of the explanation in Figure 2. The previous data automatically influences the scale mean. 73,3% of respondents believe that the UI/UX online course they underwent during February is easy to learn, easy, understandable, and clear, which aligns with the highest mean of 2,2 out of 3 for perspicuity. Then, 66,7% of respondents believe that the UI/UX online course they took makes them feel in control of the interaction, secure, and predictable, in line with the dependability scale with a mean of 2,0 out of 3. 63,3% of respondents believe that the UI/UX course falls within the scale of attractiveness, efficiency, and stimulation, consistent with their respective means of 1,9 out of 3. Lastly, 50% of respondents believe that the UI/UX online course is quite good in creativity and innovation, but respondents don't see it as very up-to-date.

After reviewing the mean score based on scale classifications in Table 2, a benchmark comparison will be provided in Table 3 to offer a clearer depiction of the final assessment of each scale. This comparison will help to clarify the differences between the scales, thereby providing deeper insights into respondents' feedback on the online UI/UX course experience.

Table 3. Benchmark

Scale	Mean	Comparison to Benchmark	Interpretation
Attractiveness	1,9	Excellent	In the range of the 10% best results
Perspicuity	2,2	Excellent	In the range of the 10% best results
Efficiency	1,9	Good	10% of results better, 75% of results worse
Dependability	2,0	Excellent	In the range of the 10% best results
Stimulation	1,9	Excellent	In the range of the 10% best results
Novelty	1,5	Good	10% of results better, 75% of results worse

Table 3 provides an overview of how each scale contributes to the comparison results with benchmarks in assessing the end-user experience for UI/UX online courses. The results indicate that the user experience quality scales are rated as "Excellent" based on the benchmark dataset for

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the attractiveness, perspicuity, dependability, dan stimulation scales. “Excellent” in this benchmark means that these aspects of UI/UX online course is great. Meanwhile, the efficiency and novelty scales are rated as "Good" in terms of user experience quality. “Good” in this benchmark means that these aspects of UI/UX online course is good enough, but still there’s a room for upgrading. This suggests that overall, the UI/UX online courses received very positive responses from the respondents.

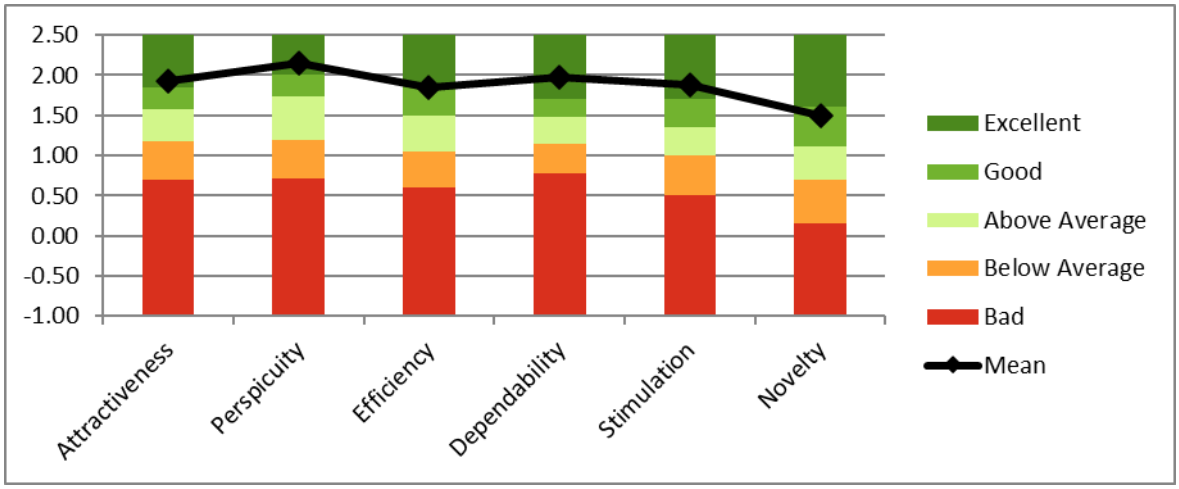

Figure 3. Benchmark Chart

The benchmark graphs for each scale can be found in Figure 3 where the attractiveness scale gets 1,9 of an average value, and then the perspicuity scale gets an average value of 2.2. The efficiency scale gets an average value of 1,9. The dependability scale gets an average value of 2,0. The stimulation scale gets an average value of 1,9. Besides that, the novelty scale gets an average value of 1,5.

Through observation of Figure 3, it becomes easy to assess how positively UI/UX online courses are perceived and their success as one of the effective platforms for online UI/UX learning. As an illustration and concrete evidence of the benchmark results shown in Figure 3, Figure 4 presents data from respondents in the Software Engineering who won the UI/UX competition during the period from February to April 2024. This data not only reinforces the previous benchmark results but also highlights the achievements of participants from this department, providing further insights into their skills and accomplishments in the field of UI/UX.

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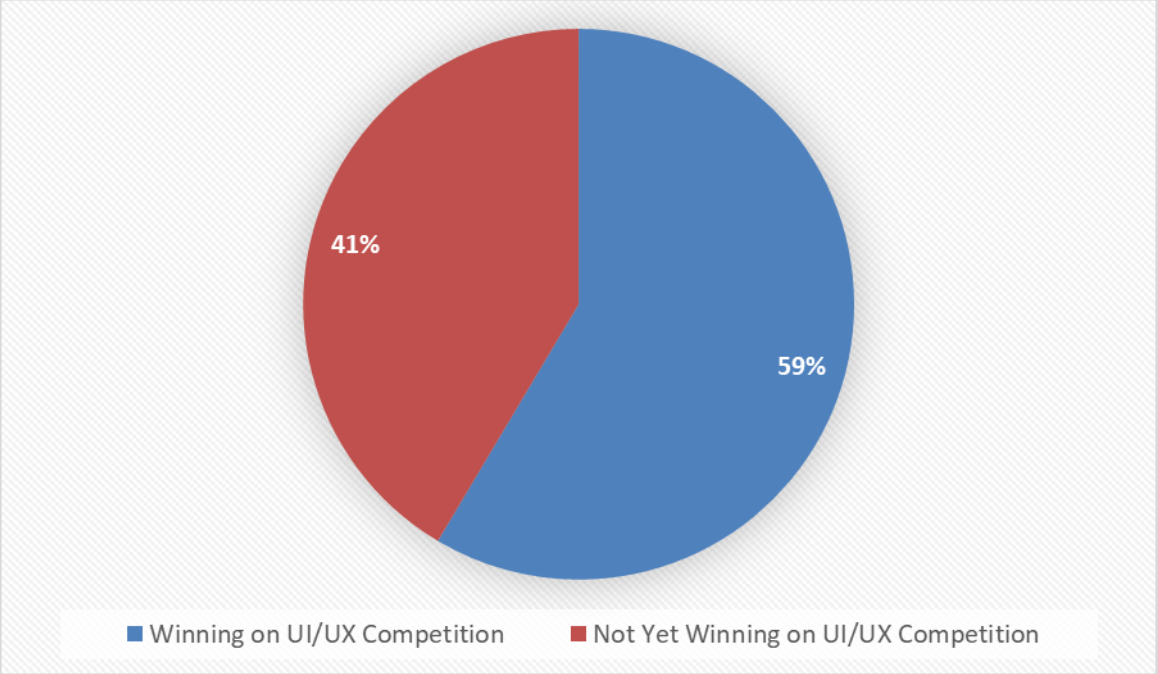

Figure 4. The UI/UX Competition Winner

Figure 4 illustrates the percentage of competition winnings (February - April 2024) among respondents who participated in the online UI/UX course during February 2024. Out of a total of 41 respondents who completed the questionnaire, 59% (24 respondents) successfully won the UI/UX competition either individually or as part of a group. On the other hand, 41% (17 respondents) haven't won the UI/UX competition, finalists are not among the winners. These results are quite satisfactory in depicting the achievements of software engineering students after completing the online UI/UX course. Furthermore, comparing them with the previous graphs (see Figure 2) allows for a more detailed examination of the strengths and weaknesses of UI/UX online courses, as evaluated by software engineering technology students who are the respondents. By considering both graphs, a more comprehensive insight into the effectiveness and overall quality of the online UI/UX learning experience can be gained.

4. CONCLUSION

Based on this study, learning UI/UX through online courses can greatly enhance understanding of the materials. The use of UEQ in this study helps identify the key aspects that make UI/UX online courses appealing. Nearly all respondents expressed satisfaction with their learning experience in UI/UX online courses, as evidenced by over half of the respondents winning UI/UX competitions. In addition to serving as a leisure activity, learning via online courses also offers students a refreshing experience due to the flexibility of scheduling they provide. In previous discussions, the novelty aspect was noted to have the lowest average score among the six aspects. This highlights the importance of incorporating unique or novel elements into online course platforms to attract more users. Addressing this can be key in developing online course platforms, ensuring they remain competitive and appealing to a wider audience.

5. DECLARATION OF COMPETING INTEREST

We declare that we have no conflict of interest.

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