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ORIGINAL PAPER

Exploring student perceptions and experiences of different teaching and learning approaches in architectural history education: a comparative case study

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Abstract
The purpose of the current research was to investigate the perceptions and experiences of university students regarding three different teaching and learning approaches constructed as a face-to-face approach, a technology-supported traditional approach, and an e-learning approach. The researchers attempted to report the preliminary findings of student perceptions and experiences from test lectures given during an EU-funded project which utilised new approaches (i.e. a digital interactive tool and an e-learning platform) in architectural history education. Our qualitative comparative case study involved focus-group interviews with 22 students who took part in different groups for the same course over 6 weeks in the 2018–2019 academic year at a large public university in Southeastern Turkey. The same curriculum content was used for each group in the same course divided into three groups. Semi-structured interview forms were used to examine students' perceptions and experiences about their groups to compare the pros and cons of the approaches and recommendations for the improvement of each approach. Students put great emphasis on teacher guidance, but they demanded alternative ways to enhance their learning. Timeline travel tool was regarded as a useful interactive tool to be used as a companion and supportive material in architectural history courses. It was understood that the timeline travel e-learning platform could be used as a supplementary resource, not necessarily taking over the role of an instructor. The research suggested that a blended learning approach could make more contributions to student learning.

Keywords Architectural history education · Digital tools · e-learning · Focus-group interview · Interactive · Timeline travel

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Introduction

In most of the countries, architectural education was institutionalised in the nineteenth century and architectural history, that involves studying and interpreting architecture to perceive and interpret the past by investigating its forms and its evolution, became one of the major components of this education at higher-education institutions throughout the world. Even the content of these courses varies from one country to another, the teaching approach does not seem to be affected much by cultures or regions (Baydar 2003; Heynen and De Jonge 2002; Neumann 2002; Swenarton 1987). Conventional architectural history teaching methods (i.e. lectures supported with required readings and research papers) have been persistently used by instructors—usually architects or historians—at the architecture departments of universities in many countries and institutions (Thompson 2017). However, these methods have started to be questioned and several new efforts, such as Global Architectural History Teaching Collaborative, are adapting these courses to the needs of new generations equipped with digital tools and with new syllabi in a global perspective.

Conventional teaching/learning

Architectural history courses, similar to many other theoretical courses taught at universities, are usually taught face-to-face, with instructors almost always being active presenters and students being passive listeners (Thompson 2017; Sanusi et al. 2018). Presentations aided with images or videos of buildings to be covered are used while instructors narrate the histories and describe the architectures of buildings, while students take notes or only listen if they are provided with presentation slides by the instructor.[1] This way of teaching was praised in the Congres Internationaux d'Architecture Moderne (CIAM) in 1951 by Walter Gropius, famous architect and the founder of Bauhaus School, as he proposed studying architectural history in discrete periods rather than through a grand survey:

> … the study of history should be made in the way that a teacher analyses a work of art and shows the whole background of that period: the politics and the means of production, the poetry, and art of that time. Then relates this work and art, as a result of all those common conditions of that time. That is a method of analysis which, if it is done a few times, will enable the student to go on on his own; to use that method again so that he can analyze whatever he wants to by this method. (Swenarton 1987, p. 207)

This method is sometimes strengthened with in-class discussions in which students contribute their ideas and experiences of architecture. On the other hand, this conventional in-class teaching occasionally is replaced by on-site teaching, in which students are taken on excursions to nearby buildings, ancient sites or museums, and instructors have the opportunity to present while showing real, three-dimensional buildings rather than their photographs or videos (Neumann 2002). This approach is far more efficient for students' learning, because they have the chance to go one step further than the instructor's presentation and interact with buildings by walking inside or around them, touching their materials or inspecting their details (Hudnut 1957). But, it is also apparent that this method is hardly feasible when the remote locations of subject buildings are difficult to reach. On the

[1] This teaching method is described by Hudnut (1957).

other hand, history courses are complemented with on-site or in-class exercises that require students to make drawings of historical buildings (mostly plans or perspective sketches), which is a skill that provides a good opportunity to understand a building as a part of architectural education (Bergdoll and Thomine 2002).

Another approach used in architectural history education involves student presentations, with some lecture topics being studied and presented to the whole class by one student or a group of students. In this approach, presenters take an active role and learn more about their specific topic, but the rest of the students in the class are passive listeners, especially when they do not contribute to discussions (Thor et al. 2017). Similarly, term projects are given to students as a part of their education and research a specific topic (usually a building or a style) from the course subjects and they prepare a paper related to it. It is usually observed that students who pay adequate attention to their projects learn those subjects better than other topics (Kokotsaki et al. 2016), but other subjects of the course remain 'untouched' or less explored.

However, the above methods ranging from more teacher-based to more student-centred do not fully meet the needs of today's architecture students, who were born into the digital era and are keen to learning by doing. Present architectural history teaching methods lag behind the cognitive capacities of architecture students who are more inclined towards visual analysis than traditional text. Therefore, it is not surprising to hear undergraduate architecture students describing architectural history as one of the least enjoyable courses, but refrain from using the phrase 'the most boring subject'. Even though there is growing interest in alternative teaching methods that give priority to students' creativity and involvement in the learning process in a collaborative way (Craft and Jeffrey 2008; Jeffrey and Craft 2004; McWilliam 2009; Voorhees 2001), and even though face-to-face teaching or direct instruction turns out to be the least effective way of education not only in architectural history courses but also in most other disciplines (Arends 2012), teacher-centred instruction still retains its dominant place in education.

Technology-supported teaching/learning

Although previous literature on architectural history education mostly discusses what to teach rather than how to teach (Bozdoğan 1999), several authors advocate more-effective architectural history teaching consistent with the internet era,[2] and there is a significant increase in the number of quests for new methods to improve the success of theory-based courses (Salama 2010; Teal 2011). Moreover, the recent trends in architectural history education also require a switch from a teacher-focused transmission of knowledge to a student-centred approach to learning (Cimadomo 2014; Sanusi et al. 2018).

The traditional approach adopted for teaching architectural history mainly centres on teachers who explain their professional knowledge using textbooks and then asks students to complete corresponding course assignments and reading-related books. However, in the face of contemporary post-1990s students, this approach or method has remained inefficient (Xiong et al. 2017). Educational environments have changed dramatically because of the lack of effectiveness of traditional approaches and the cost-effective availability of technology, which has triggered the emergence of alternatives to the traditional approach

[2] For a recent study on the integration of teaching architectural design and architectural history, see Li (2018). For an approach that puts the use of AR (augmented reality) into focus, see Sanusi et al. (2018).

(Vogel and Klassen 2001). Davis et al. (2018) argue that the presence of more-immersive, -interactive and -intelligent environments can make contributions to online learning environments through digital interfaces, sensors and devices. In technology-related literature, it is argued that "the implementation of ICT technologies within innovative pedagogical approaches can contribute to the emergence of novel pedagogical modes and learning collaboration patterns among the students" (Nachmias et al. 2000, p. 103). Technology-supported teaching contributes to student achievement positively (Batdi et al. 2018). Furthermore, more research is needed to obtain evidence regarding technology's effective educational contribution, although there is a growing influence of technology in higher education (Kirkwood and Price 2014). For that reason, adopting novel approaches to architectural history education can make significant contributions to understanding about how to contribute to students' educational discovery and the emergence of innovative pedagogical modes and approaches.

By taking current trends into consideration, the Timeline Travel: An Alternative Tool for Architectural History Learning and Teaching project was developed and implemented, with the ultimate aim of creating a digital, interactive teaching and learning companion for architectural history courses that could facilitate education in this specific subject. The intellectual outputs of the project, timeline travel tool (TTT) and timeline travel e-learning platform (TTeLP), are based on the involvement of students in ways that would transform them from passive listeners to active learners through the use of digital technologies. This new approach enables the students to have an online companion with specialised content to consult, study anytime on their own, make reviews of a subject whenever they wish, avoid the information pollution on the Internet, and decreased cost of learning.

This article introduces the results of test lectures that used Timeline Travel, which was created and tested throughout an EU-funded project (from 1 September 2017 to 31 August 2019) by a transnational team.[3] With the collaboration of interdisciplinary teams from Gaziantep University (GAUN) and Yeditepe University (YU) in Turkey, University of Bologna (UNIBO) in Italy and University of Humanities and Economics in Lodz (AHE) in Poland, the two major project outputs of TTT and TTeLP have been developed and integrated with newly-prepared content for architectural history courses. These outputs help both instructors and students while teaching and learning architectural history. Because new generations are much more prone to digital tools, they are expected to adapt and enjoy using this digital tool and learn as they 'play' with it.

TTeLP, which works in connection with TTT, was integrated with newly-prepared content for four architectural history course modules, based on newly-designed syllabi. Moreover, TTeLP stands out as the first e-learning platform dedicated to architectural history, although it could easily be adapted to other fields and courses. For instance, it is possible to create timelines of people, events or artwork besides building timelines on TTT (e.g. Byzantine Emperors, 19th Century Events or Renaissance Paintings). Hence, scholars from other fields, such as history, history of education, art history or urbanism, could create their timelines on the TTT and their e-learning courses on the TTeLP. After creating a teacher account, instructors can upload their lecture materials (articles, videos, quizzes, tasks, etc.) and assign them to their students as a private (non-public) course with a password, or suggest it as a new course of the TTeLP for the review of the editors.

[3] For more information about the project, partner institutions, associate partners, team members, intellectual outputs and project news, visit the project website: http://timelinetravelproject.gantep.edu.tr/.

Purpose of the study

In the present article, we present preliminary findings from test lectures of a new approach in architectural history teaching/learning to compare, through a qualitative lens, students' hands-on experiences and perceptions about the newly-developed method and a traditional approach. The purpose of the current research was to investigate the perceptions and experiences of undergraduate students regarding three different teaching and learning approaches: a face-to-face approach; a technology-supported face-to-face approach; and an e-learning approach. We report preliminary findings from test lectures given during our EU-funded evaluation of the effectiveness of a new approach in architectural history education.[4] In this paper, we present qualitative evidence regarding the test lectures held at Gaziantep University's Department of Architecture during the 2018–2019 Fall term in the ARCH211 Architectural History II course.

Because TTT and TTeLP were newly developed and used in architectural history courses, it was essential to uncover students' experiences and perceptions after their participation in different teaching/learning approaches and to reveal the perceived effectiveness of these new digital tools and the challenges faced by students. Thus, we thought it essential to compare conventional teaching/learning approaches (i.e. face-to-face teaching/learning) and contemporary approaches (such as e-learning) in the field of architectural history education, as well as to identify advantages and/or disadvantages these two new approaches (TTT and TTeLP). In line with the purpose of the study, our research question was: "How do undergraduate students perceive and experience different teaching/learning approaches (face-to-face, TTT and TTeLP) used in an Architectural History course?" Within the framework of the main research question, the objectives were:

- To reveal the contributions of different teaching/learning approaches (face-to-face, TTT and TTeLP) in architectural history teaching/learning,
- To uncover the limitations of different teaching/learning approaches (face-to-face, TTT and TTeLP) in architectural history teaching/learning.

Methodology

Research design

Our qualitative research involved a comparative case study design examining the perceptions and experiences of three test groups who were involved in diverse learning/teaching approaches while studying the same content in an Architectural History course. We preferred to employ case study method because it enables researchers to find answers to 'how' and 'why' questions (Baxter and Jack 2008) and to uncover comprehensive, systematic and profound information about events or phenomena (Patton 2002; Saldaña 2011). The case study research design adopted in this research was the comparative case study. According to Goodrick (2014), comparative case studies allow researchers to answer questions about on how and why particular interventions or policies work or do not work. This type of

[4] At the time of writing, new test lectures were to be held at Gaziantep University, as well as architecture faculties of the University of Bologna and Yeditepe University.

case study also makes it possible to compare the research topic within and across contexts. Furthermore, analysis and synthesis of the similarities, differences and patterns within and across more than one case can be done based on a common objective. Yin's (2014) steps in comparative case studies were followed in the current research:

- Because the research involved evaluating different teaching/learning approaches (face-to-face, TTT and TTeLP) in architectural history teaching/learning, it was appropriate to use the comparative case study design.
- In terms of teaching and learning theories, the contributions of novel approaches to teaching/learning of architectural history to increasing students' activation and learning were taken as an initial proposition.
- The cases were defined as face-to-face, TTT and TTeLP teaching/learning approaches, and each approach was implemented to three different groups.
- First of all, the same course content was delivered to three different groups by utilising the above approaches and evidence was collected after a 6-week implementation. Focus-group interviews were held with students for different groups. The data collected were analysed using the content analysis technique, and the findings were synthesized based on each case and across cases.
- Although the novel approaches provided significant contributions to students' activation and learning during the course process, these approaches also might result in limitations to students' outcomes and intended contributions.
- The researchers reported the findings obtained from the interviews by synthesising the pros and cons of each learning/teaching approach.

The comparative cases examined were three different student groups who took the Architectural History II course in the fall term of 2018–2019 academic year at Gaziantep University, Turkey, but they experienced three different teaching/learning approaches: a conventional face-to-face teaching/learning approach; a technology-enhanced approach combining face-to-face teaching/learning and Timeline Travel Tool (TTT), and a self-directed/autonomous approach of Timeline Travel Tool E-Learning Platform (TTeLP).

Participants

The sample consisted of 22 second-year/junior university students who were enrolled in the Department of Architecture at Gaziantep University, a large public university located in southeastern Turkey. In the fall semester of 2018–2019, 52 students were enrolled in the Architectural History II course for which Timeline Travel test lectures were held for 6 weeks. Students were divided into three groups (G1 $n=17$; G2 $n=18$ and G3 $n=17$) after the mid-term examination in such a way that each group's mid-term average was nearly the same. Students received education in these groups until the final examination. After the final examinations, the researchers wanted to have closer insights into students' perceptions and hands-on experiences regarding their groups because the digital tool, Timeline Travel Tool, and e-learning platform were being used in such a course for the first time.

Out of 52 students, 22 were included in the present research. This voluntary group was selected based on willingness to participate in interviews and regular attendance (above 70%) in the learning/teaching groups for qualitative interviews. Regular attendance was taken as a selection criterion for examining each approach in-depth, with those who

attended the courses at a high rate sharing their actual perceptions and experiences. For this reason, 30 students were not involved in the interview groups. The face-to-face group consisted of 4 females and 4 males, with students' ages ranging between 20 and 22 years. The face-to-face and TTT group included 4 females and 4 males aged between 20 and 23 years. Lastly, the TTeLP group was comprised of 3 females and 3 males aged between 20 and 24 years.

Data collection and tool used

The data were gathered from students using three focus-group interviews which lasted between 17 and 34 min on 9 March 2019. Discussions in the focus groups lasted until no new theme emerged, with the researchers terminating the interviews after a data saturation point. The interviews were tape-recorded to prevent loss of significant data. After the interviews, data were transcribed verbatim. Data were collected using a semi-structured interview protocol that was constructed by the research team through a reflexive and dialogic approach as suggested by Agee (2009). This protocol included nine open-ended questions about students' perceptions and experiences regarding their groups. When preparing the protocol, questions were based on the approach used in each group. Although the protocol was the same, the wording was changed according to the approach used in the group.

Data analysis

Interview data were analysed using content analysis, the researchers attempted to form similar units and/or patterns regarding students' views and experiences about their groups. Thus, similarities and differences between the views and experiences were revealed. A framework based on emerging patterns (advantages, disadvantages and suggestions) from interviews was used as a reference for coding. Findings were presented in accordance with the objectives of the research, namely, the contributions and limitations of each approach.

Reliability and validity

The researchers attempted to ensure the reliability and validity of the research through experts' views, thick description, direct quotations from students' views, and comparative and constant coding processes. For the validity of the interview protocol, the researchers wrote open-ended questions and then compiled and discussed the questions and constructed the final draft. After the preliminary form was constructed, the protocol was given to independent experts in educational sciences and architecture to obtain their views regarding the suitability of the questions for the research (i.e. confirmability). In addition, the researchers explained how the study group was selected and when the research was conducted, and then the whole research process was described in detail to ensure transferability. For reliability, the researchers coded the raw data individually first and then compared the main themes, sub-themes and codes collaboratively. The inter-rater reliability coefficient was calculated using the formula, Encoder reliability coefficient = Consensus/(Consensus + Dissensus × 100) (Miles and Huberman 1994). The inter-rater reliability coefficient was found to be .89 in the present research. We discussed the codes which led to disagreement and reached a consensus afterwards. Finally, direct quotations were provided from students' views. Each student was given a code (i.e. S1, S2, etc.) to ensure anonymity.

Findings

In this research, we explored group experiences and perceptions of the university students who participated in three different approaches of teaching and learning in Architectural History, namely, face-to-face teaching/learning, a technology-supported approach incorporating face-to-face teaching/learning with Timeline Travel Tool (TTT), and a self-directed approach of Timeline Travel E-learning Platform (TTeLP) equipped with TTT. Three different test groups were subject to these three different teaching/learning approaches over the 6 weeks by using the same course content. After the implementation process, the researchers attempted to explore students' experiences and perceptions regarding their groups by considering each approach's contributions and limitations to students' activation and learning.

Based on the data received in qualitative interviews, students' experiences and perceptions of their groups could be framed around three different overarching themes, namely, *advantages, disadvantages* and *suggestions,* several related sub-themes and codes. The group experiences and perceptions of students were examined in detail and presented respectively. The findings related to each group are reported in tables and emerging themes, sub-themes and codes are presented by providing evidence from students' explanations.

Perceptions and experiences of face-to-face group

Students in the face-to-face group attended courses under teacher guidance. The perceptions and experiences of the face-to-face group are presented in Table 1.

Students participating in the face-to-face group had mostly positive perceptions for several reasons. Based on their views, students wanted their teacher's guidance and the opportunity to interact easily in terms of asking questions immediately for topics that they did not understand and obtaining immediate feedback from their teacher during the course time. One student (S2) said that:

> But when there is a teacher, I can ask my questions to her/him. We are communicating interactively with our teachers. I feel relaxed.

In line with this student, another student (S1) claimed:

> I am really happy about being in that group. I want to be face-to-face with my teacher in the classroom. If not, I feel that I am not going to understand the topics.

As can be inferred from the views of students, they felt confident in learning when there was a teacher giving immediate answers and feedback and were motivated by interacting with the teacher. In addition, one of the advantages of a course with the face-to-face method was providing students with an interactive classroom environment that includes opportunities for intimate learning as a group, effective interaction among students, effective note-taking, and realising and correcting mistakes during learning. One student (S5) commented:

> Our teacher had us make architectural descriptions when we had a plan. It was impossible to do this in the second and third groups because the teacher didn't listen to you and correct your mistake. We were more advantageous than those groups.

To support this, another student (S1) stated:

Table 1 Frequency of experiences of the face-to-face group

Theme	Sub-theme	Code	Frequency
Advantages	Teacher guidance	Interaction with teacher	6
		Enabling face-to-face communication	5
		Getting immediate feedback	4
		Effective learning	3
		Having the opportunity to take notes	2
		Directing students for learning topics	2
		Providing more permanent learning	2
		Enabling activities not available in the tools	1
		Increasing motivation	1
		Providing summarised content	1
		Having a course plan	1
	Interactive classroom environment	Enabling effective interaction among students	3
		Having more effective teacher–student interaction	3
		Intimate learning environment	2
		Ensuring socialisation among students	2
		Using different teaching materials (projector, smart boards, etc.)	1
		Realising mistakes while doing	1
Disadvantages	Lack of supportive materials	Lack of reinforcement sources for learning topics	3
	Focusing on limited information	Learning only the points emphasised by the teacher	1
	Lack of extra activities	Learning mostly by listening	2
		Hindering deep learning	1
	Other limitations	Having a more theoretical overview	2
		Reaching the sources only in course time	1
		Having no time to watch videos, etc.	1
		Feeling no need to search for new information	1

Table 1 (continued)

Theme	Sub-theme	Code	Frequency
Suggestions	Formative evaluation	Adding quizzes and tasks to the course	2
	Enhancing course content	Adding more information to the slides	1
		Giving place to more practical applications	1
	Using TTT as a supportive source	Being able to use TTT as a supportive source for examinations	2
		Using TTT as a homework application	2

> Yes, making architectural descriptions are very important. If I were in the third group, I could not know how to do this. Even though I knew, I could not make sure whether I did it right or wrong.

However, some students in the face-to-face group were of the opinion that there was no difference between the first and second groups in terms of learning the topics. One student stated:

> In the TTT group, there was a teacher but the course was taught from the TTT, not from the slides prepared by the teacher. In my opinion, there was no difference between the first and the second groups (S6).

Another student (S3) added:

> There were architectural buildings, plans both in the TTT and slides. You could search them in detail or you could overview them.

From the points that students raised, it was understood that, in some situations, TTT made no difference. However, students had negative perceptions of the face-to-face approach as well. Lack of supplementary materials, focus on limited information, lack of detailed learning activities and lack of practical application were mentioned as the disadvantages of the face-to-face approach. One student (S4) stated:

> If you learn only by listening from the teacher, what you learn is not that permanent. As far as I know, students take quizzes and tests and watch videos in Timeline Travel, in this way, they can reinforce what they have learned. During the course time in our group, there may not be time for watching videos. There were pictures in our courses too, but we could have more chances to see them.

In line with this student, another student (S2) said:

> The teacher is speaking and we are listening. When we have questions, we are asking. There… when we had practical applications outside, the teacher was giving feedback about our mistakes and we were correcting them. In addition, we were doing applications in groups. Because of this, it was really pleasant.

This student also suggested the adoption of more theoretically-oriented instruction and the lack of studying in groups. Another disadvantage was identified by one student:

> I want to be in the second group (face-to-face + TTT) because the TTT has a positive effect. For example, we were taking notes only about what our teacher said. We were looking for extra information from the internet if we felt we were in need. But in the TTT, I think, there is necessary and enough information about the course, because my friend told me this. For this reason, I wanted to be in the second group and benefit from the TTT (S1).

Although they mostly stated advantages and fewer disadvantages, students also made suggestions for improving the face-to-face teaching/learning approach. In their views, it is possible to understand that students are happy with this approach. However, to acquire better learning in this context, they recommended some ways to improve learning the topics. They stated that there were no quizzes and an insufficient number of tasks to get feedback on their learning at the end of the course. According to students, this was important because, if they received feedback, it would contribute to more permanent learning. In terms of the enhancement of course content, students suggested that adding more information to slides

used in the course would be advantageous. Another suggestion given by the students in the face-to-face group was that, because there was more theoretical information, the course should be enhanced by adding more practical applications. Above all, students strongly recommended that the TTT should be used as supplementary to the face-to-face approach.

To sum up, participants considered the face-to-face approach advantageous in terms of interaction with the teacher, enabling face-to-face communication, getting immediate feedback, and achieving more effective teacher–student and student–student interaction. However, some students believed that this approach had some limitations in terms of a lack of reinforcement sources for learning topics, learning mostly by listening and being more theoretical. The suggestions highlighted were related to the development of this approach by adding quizzes and tasks in a way that enables formative assessment and the use of TTT as a supportive source for both examinations and homework.

Perceptions and experiences of face-to-face + TTT group

Students in this group participated in the course under teacher guidance and used TTT during course time. The perceptions and experiences of the face-to-face + TTT group are given in Table 2.

As presented in Table 2, group experiences of the second test group (Face-to-face + TTT) were framed around three different overarching themes of advantages, disadvantages and suggestions. In the interviews, students in this group mentioned that they were very satisfied with the combined use of the face-to-face approach and the TTT in the Architectural History Course and considered themselves lucky to be in this group. Students identified many advantages of this approach. The face-to-face approach allowed students to directly access the instructor to obtain an immediate response to their queries and on-the-spot feedback. Students highlighted that the TTT following face-to-face instruction helped them to acquire more thorough knowledge of the subjects, use different sources, gain access to supplementary resources and could participate in courses more actively. The following is the opinion of one of the students:

> In face-to-face instruction, the lecturer speaks, while the students listen passively. Only certain students make efforts to participate. But in the face-to-face + TTT group, in addition to usual teaching procedures, the lecturer gave us extra time afterward to do research using the Timeline Travel Tool. It was us who did the actual research about the structures and their characteristics. I found being in this kind of teaching environment that allowed active participation more efficient overall (S4).

Another student who experienced the face-to-face approach for this course explained the advantages of being in this group:

> For instance, last year, our courses were taught using the face-to-face approach. With the new system, there could be sections not covered by face-to-face teaching. The lecturer still told us about descriptions, but only verbally. However, the Timeline Travel provides us with a detailed version of those descriptions in written form. You could find in Timeline Travel any extra knowledge not covered in the lecture. So using the system made the course more efficient from my point of view (S7).

The interviews also revealed how the students preferred a combined use of the face-to-face approach and the TTT in terms of providing visual materials (for buildings) and combining theory and practice. One student said:

Table 2 Frequency of experiences of the face-to-face + TTT group

Theme	Sub-theme	Codes	Frequency
Advantages	More permanent learning	More effective teaching	4
		Having opportunities for repetition	4
		Learning from different sources and supplementary resources	4
		Active participation	3
		Getting more detailed information	2
		More interaction between teacher and students	2
		Meeting different learning styles	1
		Getting immediate feedback	1
	Diverse learning/teaching methods	Using direct instruction with TTT	5
		Providing visual materials (for buildings)	3
		Combining theory and practice	2
	The TTT's being a supportive companion	Being a reliable source	2
		Being easily accessible	2
		Including more informative input	1
		Arousing curiosity regarding architecture	1
		Enhancing motivation for learning	1
		Providing opportunities for analysing structures	1
Disadvantages	Problems with the TTT's design	Missing some photographs	1
		Presenting too-long explanations	1
		Lack of virtual tour in buildings	1
		Lack of adequate direction for the use of the tool	1
		Limited content for some buildings	1
		Lack of 3D images	1

Table 2 (continued)

Theme	Sub-theme	Codes	Frequency
Suggestions	Diverse suggestions for the improvement of the TTT	Providing the opportunity to find out the buildings despite being written incorrectly	3
		Adding multiple language choices	2
		Enhancing the tool with videos	2
		Adapting it for different courses as a resource	1
		Providing the opportunity to tour inside buildings	1
		Enhancing the tool with 3D images	1

> The teaching in the second group combined theory and practice. Both our research and our interactions with the lecturer allowed us to do so (S11).

Another student stated his views on TTT's capacity for providing visual materials as follows:

> I was very impressed. It also affected us culturally. I even researched the topics that I would not be asked about in the exams. Looking from a different perspective allowed me to make further inquiries, for example, about what plan was used in that building, where it stands in terms of its architectural characteristics, and consequently, my cultural horizon was expanded. It also improved my grades. So, I'm really pleased (S3).

In addition to the advantages that the face-to-face approach brings, students also mentioned in the interviews that the utilization of the TTT as a supportive tool provided advantages for the teaching of architectural history in terms of including more informative input, providing a reliable resource, being easily accessible and providing opportunities for analyzing structures. One student said:

> For instance, when you make research on the Internet, you have lots of irrelevant results to sift through. And you don't know which source to trust. I mean there is just so much information out there you get lost in the piles of data. And that's where the Timeline Travel comes in, helping you navigate your way through big chunks of data (S9).

Concerning this issue, another student said:

> I think it is a reliable resource. Almost no one uses encyclopedias in this age, including us students. As I said, there is just too much data out there and so it is good to have a reliable resource at one's disposal. And it is good that it's easily accessible (S11).

Although students in this group thought that the approach is more effective and efficient than that used by other groups, they also believed that the TTT had some shortcomings associated with being a new tool. In this context, students' opinions regarding disadvantages of being in this group were brought together under a single sub-theme called 'problems with the TTT's design'. In the interviews, students mentioned certain aspects of the TTT that were lacking, such as some missing photographs, explanations that were too lengthy, lack of virtual tours of buildings, lack of adequate direction for the use of the tool, limited content for some buildings and lack of 3D images. Furthermore, students added that the TTT could be an even more efficient if these shortcomings were addressed. Concerning the shortcomings of the TTT, the students commented:

> There were some information sections with lengthy sentences about certain structures. And I have to admit I got bored reading these long-winded texts in English. Despite the length of the texts, they were not really descriptive and reading them made me tired (S6). It was a bit lacking in terms of the variety of the structures presented, at least that's what I felt (S2). In the database, the structures were assigned a specific name and any slight deviation from that name while looking for a particular structure yielded zero results. We struggled a bit in that regard; you had to write the exact same name (S4).

In this context, it can be argued that students had expectations about the conversion of TTT into more user-friendly and richer supportive material.

In addition to their expectations concerning the elimination of these shortcomings, students made various suggestions for improvement, including adapting it for different courses as a resource, adding multiple language choices, providing the opportunity to take a tour inside buildings, and enhancing the tool with videos or 3D images. The following are some of the opinions that students provided:

> For instance, Yandex or Google Earth allows one to take a tour inside the buildings, and if we could have integrated that feature into Timeline Travel, it would be so much better than it is now. The content can be enriched through videos showing the inside of the buildings, even if the structure is not on the map (S4). Some of the English words provided are just too technical, and it was impossible to find them on the Internet. Their Turkish equivalents could be provided (S1). It could be enriched with 3D images for visual purposes (S7).

While students thought that the face-to-face approach was necessary for more-efficient learning of architectural history courses, they also believed that the aforementioned shortcomings of TTT should be addressed and that the program should be improved in line with their suggestions to make it even more efficient and useful.

Perceptions and experiences of TTeLP group

Students in this group adopted self-directed learning using the TTeLP. The perceptions and experiences of the third test group (Timeline Travel e-Learning Platform) are presented in Table 3.

The group experiences of the third test group (TTeLP) were framed around the three overarching themes of advantages, disadvantages and suggestions. This group participated in the Architectural History course which was organised in a way that required students to learn on their own by using TTeLP integrated with the TTT. Students' perspectives on taking part in this group were generally perceived as unpleasant for various reasons.

Students held some negative perceptions regarding being in the third test group because it was their first independent learning experience without teacher guidance. Based on their views, students were accustomed to learning with teachers in courses that mostly followed traditional approaches that necessitated note-taking, listening and doing what teachers offered in the lectures. Their justifications were seen to be related to final examinations. Examination anxiety caused students to focus only on how to pass, which was observed to be the main reason for their negative experiences in the group. One student said:

> The system was good. However, there was another issue now. Unlike the two other groups, we were led to receive such an education, and all groups entered the same exam. As the issue of exam exists in our minds, this naturally strains the individual. In other words, the purpose of the third group was getting information by ourselves, as we understood, not from the teacher. Therefore, it depended on how you studied. But when you think of entering in usual exams or when you think you will enter an exam, this time you ask "Which information is important", namely you say "Do we lack this? Is this important?" It was complicated for me. I had difficulty (S1).

Based on what the student emphasised, anxiety about the examination caused her to hold negative perceptions about the group. Consistent with the first student's opinion, another student also commented on the issue of the traditional instructional approach:

Table 3 Frequency of experiences of the TTeLP group

Theme	Sub-theme	Code	Frequency
Advantages	Providing flexible studying and learning time	Having no time limitations	4
		Being able to stop and study again	3
		Reaching the source whenever needed	2
	Quality software	Providing detailed information	5
		Having HD quality photographs and videos	2
	Improving virtual memory	Recognising the structures easily	2
	Enabling self-evaluation	Being responsible for individual learning	2
		Involving quizzes and tasks	1
Disadvantages	Lack of teacher guidance	Being unable to focus on important points	5
		Lack of teacher's explanations	4
		Lack of samples given by the teacher	3
		Lack of a motivating learning environment	2
		Not being able to ask questions immediately	1
	Providing too much and detailed information and tasks	Causing difficulty in taking notes	2
		Spending too much time on understanding topics	2
	Lack of getting comprehensive feedback	Not being able to track progress	3
		Causing low motivation for learning	2
		Not getting immediate feedback	2
		Not comprehending the topics as a whole	1
	Being unfamiliar to a new tool	Feeling worried due to learning independently	4
		Causing a sense of not learning	3
		Lack of directions about using the tools	1
	The dissonance between content and exams	Involving questions not covered in the platform	3
	Learning-related problems	Not being able to filter important information	6
		Not being able to concentrate	2

Table 3 (continued)

Theme	Sub-theme	Code	Frequency
Suggestions	E-learning platform-related	Providing rewards to those completing the tasks successfully	3
		Designing in a more interesting way	2
		Increasing the number of quizzes, tasks and group work activities	2
		Providing online interaction hours with teachers	1
		Publishing the answers to tasks and quizzes	1
		Adding educational games	1
		Stressing significant information	1
		Organizing quizzes as pretest and posttest applications	1
		Involving different language options	1
		Providing virtual bonuses	1
		Forming a competitive environment	1
	TTT-related	Adding videos	3
		Providing auto corrections	3
		Adding 3D virtual tours	2
		Adding the option to search for buildings chronologically	2
		Enabling a sense of being inside buildings	2
		Adding the option to compare two buildings	1
		Providing flexibility to reach buildings in different places	1
	Other issues-related	Need for change in students' mentality	4

> Naturally, we have received education under teacher guidance so far, this is an unusual situation. But I think if it serves for learning not for entering the exam, it can be successful (S4).

Other students also held the same perceptions about the group. Drawing on what they articulated in one-to-one interviews, students were not highly satisfied with their group because of examination anxiety and it being their first experience with independent/self-directed learning. There were some aspects that students found positive about their groups or the tools used. This arguments can be supported by students' perceptions of the advantages and disadvantages of the TTeLP. Their positive perceptions were labeled as advantages that the TTeLP offered to them.

In terms of the TTeLP providing flexible studying and learning time, students stated that the system enabled them to work without time limitations. They believed that having the freedom to read, reach out to the system, and study and stop studying whenever they wanted were among the main advantages that traditional face-to-face instruction could not offer to them. One student commented:

> In my opinion, there was the ease with the system. For example, at 12 p.m. at midnight, no teacher would come and teach us. However, you could study whenever you want here. There were YouTube videos. Or in the morning of the exam day, when you say "I do not remember this", you can look at it immediately… (S3).

The software system was perceived to be of high quality. HD quality photographs and detailed information about the course content were among satisfactory aspects of the system. One student argued:

> The program was in fact very good… highly comprehensive information… the photographs were very clear. Namely, it gave such a feeling. For example, when we looked at a building, we felt like we were inside that structure. HD quality photographs, very comprehensive information, detailed and clear. (S2)

Other students perceived that advantages were the TTeLP's effect on improving their visual memory as they had to read and re-read to better learn and evaluate their performance. Quizzes and tasks added to the system made students evaluate what they learned and return to the system to re-study when necessary. These were identified as advantages that the TTeLP offered to them. S3 stressed the significance of the quizzes and tasks:

> In my opinion, quizzes and tasks were good. Because when you solve the quiz, there are 4 options and you evaluate what you know and what you do not by yourself in some way.

However, students also held negative perceptions of the TTeLP. Disadvantages mentioned were the lack of teacher guidance, the system providing too much and too-detailed information and tasks, the lack of comprehensive feedback, being unfamiliar to a new tool, the perceived dissonance between the course content and the final examination, and having the sense of not learning. Concerning the lack of immediate feedback, one student (S4) expressed:

> For example, when you have a question, you can write it in the forum part which is provided. However, you do not know when feedback will be given. But in the course, when you ask a question to the teacher, you can get its answer immediately and then you understand it. There was such a problem. You could not get immediate answers.

The disadvantages were seen to have emerged because of students' usual learning approaches and because of the system itself. Because students were accustomed to learning under teacher guidance throughout all of their school lives, learning on their own caused them to feel perplexed when left alone. Not having any experiences with such a digital system before also left students feeling challenged in learning. Apart from these, some disadvantages were seen to have stemmed from the system. Students believed that there was an enormous amount of information on the system, which made it hard for them to identify what was more significant. One student argued:

> As they said, there was either a midterm or a final exam in front of us. We had limited time. We had to study. We came here for two hours, I thought "how enjoyable can we understand the topics in two hours?" Certainly, time was not enough. When I read slowly, I could not complete it. When I tried to take notes, I could not. I could not decide on which information was significant, which was not… Therefore, face-to-face learning is more…hmm… for me… In other words, I always thought I wish I could be in the face-to-face group (S6).

In addition, students argued that they could not get any feedback about the quizzes that they took, which hindered their progress. Some students considered that there was dissonance between the course content and the final examination. Some topics in the final examination favoured students in the other two groups, as S4 argued: "The final examination was better for students in the other two groups." Lastly, not being able to see personal progress and feeling that they were not learning effectively were among the main reasons for negative perceptions of the TTeLP.

In addition to the advantages and disadvantages of the TTeLP, students made some suggestions to improve both TTeLP and TTT. Students also mentioned their role in not fully embracing and making use of it at the final stage. Students recommended some amendments and additions to the TTeLP to make it a better and more-useful digital tool for learning. Students offered some suggestions about aspects already existing in the system that needed improvement and about aspects which were not covered in the TTeLP. For already-existing aspects, students argued that the system should involve different language options and stress significant places in the explanations on the platform and that the number of quizzes and tasks should be increased. These suggestions were related to the aspects which were perceived to be inadequate in the platform because there were both Turkish and English language options, significant points were already highlighted in the texts, and there were several quizzes and tasks. Although these suggestions were already addressed in the system, students found them unsatisfactory and asked for their improvement.

Apart from these suggestions, some new ones were offered to make students more engaged in the system and learn better. These included providing online interaction hours with teachers, publishing the answers of the tasks and quizzes, adding educational games, providing rewards for students completing the tasks successfully, increasing the number of quizzes, tasks and group-work activities, organising quizzes as pretest and posttest applications, designing more interestingly, providing virtual bonuses and forming a competitive environment. To illustrate, S6 asked for online interaction hours with the teacher:

> There may be teaching like a live broadcast in the system. For instance, like an education in which everyone can attend at a predetermined time, simultaneously with the teacher's presence as in the classroom… during the teacher's talking… technology has ultimately advanced… we can have headsets and ask questions. There are maybe

> some activities in which the teacher can say "take this test, participate in the course, even you have questions, you can ask me between this and that time. I will be there".

Another student, S1, pointed out to the need for game-like aspects:

> Each task can have points, for example, one student who passes 100 points will be in the first category. More active participation can be ensured by adding more competitiveness.

Based on the suggestions, students wanted to make sure that they were progressing in terms of the outcomes of the course and, therefore, they asked for virtual teacher guidance, the publication of answers to the quizzes and tasks in order to have immediate feedback, and more chances to practise what they had learned through more quizzes and tasks. This suggestion was related to the main disadvantage of having the sense of not learning. Some students found the system boring and wanted it to be gamified. Turning the TTeLP into a more-interesting format, including games, rewards, competition and virtual bonuses, weas the main point stressed by students. S5 focused on rewards and virtual bonuses:

> … A kind of reward, but a virtual one, to be published on the system. For instance, the one who has done research most can be seen in the system as the rewarded person for one week.

Apart from the TTeLP, students also made suggestions concerning the TTT. Among these suggestions were adding videos, adding 3D virtual tours, providing flexibility to reach buildings in different places, enabling a sense of being inside buildings, adding the option of comparing two buildings and searching for buildings chronologically, and providing auto-corrections. S2 underscored the function to compare two buildings in different cities:

> If you have first chosen İstanbul, you can search for it. Namely, when you have chosen İstanbul, you cannot search Bursa. It could be fine for us to be able to search for Bursa when in Istanbul on the map.

Consistently, S8 highlighted this issue in a broader sense:

> Or, there can be an option to compare one building in Asia and another one in Europe which was built on the same date. Like, compare two structures option.

Students' suggestions focused on making the TTT more user-friendly. With regards to auto-corrections, S7 commented:

> You cannot find the building if you have not written its name fully and correctly. There should be corrections like in Google.

Interestingly, the last suggestion was related to students' perceptions of e-learning. S4 asserted:

> I think our mentality should change more. Our asking for information should be like getting information in real terms, not for the preparation for exams or not getting some information. Students think that the tool prepares them for exams; therefore, I say we should change. Otherwise, the system is good.

In other words, students underscored that they should consider the digital tool for learning, not only as a means for passing the final examination.

Taken together, participants' perceptions and experiences implied that the TTeLP offered several advantages such as providing detailed information, having no time

limitations, and being able to stop and study again. Despite these points, being unable to focus on important points, lack of teacher's explanations, not being able to filter important information, feeling worried about learning independently, and lack of teacher explanations were considered limitations of this approach. In order for this approach to become more effective, the participants recommended working on changing students' mentality, adding videos, providing auto-corrections, and providing rewards to students completing the tasks.

Discussion

A significant aspect of the current study was the use of student feedback about test lectures to modify subsequent test lectures and fix the technical and content-related problems of the TTT and TTeLP. Student interviews provided invaluable insights from users for improving the test procedures and rectifying otherwise hard-to-identify issues related to the recently-developed software. For instance, lack of adequate direction for the use of the tool was a student-identified problem threatening the success of this new approach, but this issue was resolved with help from documents and tutorial videos uploaded to the system. On the other hand, thanks to students' feedbacks, quizzes and tasks were included in the face-to-face + TTT group's test procedure during the second test lectures. More importantly, with the experience of the first test lectures and feedback from students, new test groups for the second test lectures were designed on a volunteer basis by allowing students to choose their preferred group. In this way, psychological barriers and resistance against being randomly placed in a test group were eliminated. Accordingly, future use of the TTT and the TTeLP should allow students to choose the approach that fits them the best.

In conclusion, when our interviews with students, observations during test lectures and literature reviewing are considered together, it seems that conventional face-to-face teaching is not sufficient in the field of architectural history and therefore it should be supported with a digital, visually-rich, interactive learning companion. Because architecture students, who are more inclined towards visual analysis than traditional text, tend to quickly forget oral or written information and have difficulty in reaching trusted resources amidst information pollution, they should have a reliable learning companion such as the TTT or the TTeLP. On the other hand, considering that on-site visits to historic structures (probably the best architectural history education method) are usually impossible for higher education institutions in remote locations, benefitting from virtual and digital resources would not only decrease the cost of teaching, but this would also ensure equality of opportunities. Consequently, the TTT and TTeLP would equip the students in today's digitally-evolving world, making them more self-confident by transforming architectural history into an easily learned and enjoyable course.

Our research shows that test lectures yielded varying student perceptions and experiences among three different groups. Responses of the first test group (face-to-face) and the second test group (face-to-face + TTT) closely resembled each other in that they highlighted the impact of adding a digital tool, namely TTT, into the face-to-face teaching environment. On the other hand, the third test group (TTeLP) provided invaluable insights about their e-learning experience and provided several suggestions about their method of education. Therefore, the responses of these three groups are discussed and evaluated below with references from the available literature.

Students in the face-to-face group generally were satisfied with their groups because of their similarity to previous experiences in teaching and learning, which mostly were shaped

by long-term habits involving a teacher-led learning environments. Yet, students suggested the need for a supportive companion like the TTT, perhaps because using teaching methods that assume a single language and shared homogeneity of proficiencies, learning styles and motivational systems remain inadequate and inappropriate (Vogel and Klassen 2001).

As can be inferred from the responses of students from the face-to-face group, this group perceived itself as the 'safest' group among three other test groups, because they faced no novelties and basically continued their conventional architectural history lectures. They were happy with the teacher's guidance and immediate feedback, and the interaction with the instructor and other students in the classroom motivated them. Learning in an interactive environment was thought to have some merits, such as intimate learning as a group, effective interaction among students, effective note-taking and spotting and correcting their mistakes during learning time.

In line with these findings, Harrington and Loffredo (2010) also emphasised the social-emotional outcomes of face-to-face learning for students. Similarly, in the study conducted by Paechter and Maier (2010) found that students preferred face-to-face contact when the instructor serves to build up knowledge. In line with this, Price et al. (2007) advocate face-to-face communication for students to achieve positive interpersonal relations with their instructor. Although the current study did not focus on the contribution of the teaching/learning approaches to student achievement, it could be useful to review previous studies related to achievement. For example, Fillion et al. (2007) found that on-site students perform better than those participating in online courses, but surprisingly online students were more satisfied than on-site students.

Apart from the advantages that this group offered to them, the participants also underscored some negative aspects incorporating some limitations and disadvantages of supplementary materials, the provision of information, detailed learning activities and practices. Because they were aware that the two other groups had extra supportive materials and more digitally-provided information for lectures besides the content provided by the instructor, they felt disadvantaged.

Students in the face-to-face group identified as disadvantages not having extra learning materials besides lectures, not having the motivation to make personal research for more information, and having a mainly theoretical overview with few interactive practices. Consistently, Artino and Stephens (2009) and Narciss et al. (2007) found that e-learning offers multiple opportunities for individual learning by providing students with individual preferences at any time and from any place (i.e. students can select and study materials found among a large pool of information). This result in the current study suggests that students experiencing solely conventional face-to-face teaching also were looking for alternative ways of learning and were aware that they would learn better if they could become more active. One alternative way can be the use of instructional technology, which was shown to affect student performance (Rutz et al. 2003), or technology-supported teaching, which also affected student achievement positively (Batdi et al. 2018). The participants of this group made some recommendations for making Architectural History a more-effective course. Quizzes and more tasks were suggested for getting feedback about the effectiveness of their learning. Additionally, students also emphasised the provision of more information and more opportunities for practice.

Responses from the face-to-face + TTT group suggested that students felt the 'luckiest' among three test groups, because they were not only within a familiar learning environment with the teacher and other students, but they were provided with a complementary learning resource. In other words, this group benefitted from the face-to-face group's advantages, while they also had extra opportunities that were demanded by the members of the

face-to-face group. This finding is consistent with Delfino and Persico (2007) who argue that it is necessary to design flexible courses that integrate techniques from both face-to-face and online methods. In the literature, there is no significant difference between the achievement of e-learning users and students in traditional courses. However, the students who participated in blended learning were more successful than those participating in traditional instruction and e-learning (Al-Qahtani and Higgins 2013).

Although keeping this group within their conventional architectural history lectures with the guidance and immediate feedback from their teacher made them feel comfortable and motivated, supporting them with a digital, interactive, reliable and easily-accessible architectural history learning tool also gave them an alternative tutor. Students were happy about the TTT because it increased their motivation, triggered their curiosity and allowed them to investigate buildings in more detail and on their own. This approach facilitated the combination of theory and practice according to student views. Consistently, Brill and Galloway (2007) reported that using technology had various positive effects in teaching/learning, such as the technology facilitator role in presenting information to students clearly and elaborately, displaying numerous and complex examples, increasing student engagement/attention, encouraging interaction among students and teachers, and providing structure and support in the classroom. In a recent study, archeology department students believed that augmented reality could help to remove the limitations of not seeing or seeking out the objects and works (Yıldız Durak et al. 2020).

According to Hui et al. (2008), technology-assisted learning even improves students' acquisition of the kind of knowledge which requires abstract conceptualisation and reflective observation, but adversely affects students' ability to obtain knowledge which requires concrete experience. Therefore, it could be beneficial to use both the face-to-face approach and the TTT together. Although this technology-enhanced method mostly had advantages according to students' feedback, there were some negative aspects as well, such as Internet connection problems reducing the efficient lecture time or computers in the classroom allowing students to be distracted by other websites. They also focused on some issues which negatively impacted the effectiveness of the TTT as a supportive tool: missing photographs, lengthy explanations, lack of virtual tours, lack of adequate instructions for the use of the tool, limited content for some buildings and lack of 3D images. These were regarded as shortcomings to be rectified and recommendations to be followed to make the tool more effective, which is very important for effective learning. Castle and McGuire (2010) proposed that the most-important component across all course delivery modalities is the course content; outstanding advanced technology, instructor competence and the ability to 'connect' with students have little impact if course content material does not facilitate and reinforce the learning experience. Students' suggestions were mainly focused on improving TTT with more digital content or adapting it as a resource for other courses so that students become more active in the learning process.

Students in the third group (i.e. TTeLP) articulated some advantages of taking part in this group: providing flexible studying and learning time, quality software, improving virtual memory and enabling self-evaluation. Students focused on flexibility in terms of studying and learning without limitations pertaining to time and space. One of the main advantages of e-learning is that it incorporates the use of digital tools which enable learners to study anytime and anywhere (Arkorful and Abaidoo 2015). In online learning, students can access the educational experience more flexibly in terms of time, locations and distance relative to campus-based education (Ally 2008; Anderson 2008). Accordingly, online learning can provide innovative educational opportunities to students with time-management problems, low anxiety or high problem-solving efficacy (Solimeno et al. 2008).

According to our findings, students were happy about the TTeLP because they had no time and space limitations, especially when they could not access the teacher outside lectures and office hours. These are also listed as major advantages of e-learning in education as it focuses on individuals' needs and provides flexibility. Students also were happy with the TTeLP's visually-rich content (videos, in particular, made their learning more permanent) and interactive tasks and quizzes that enabled them learn while they explored and 'played', an issue that was also identified in previous e-learning experiences. Even though some students were unhappy about lengthy articles or information about buildings, others were pleased about this and even stated that they would prefer the TTeLP to learning with a teacher.

Based on student perceptions, the e-learning group had several drawbacks among three test groups, the most important one being the psychological barrier. Neither having direct interaction with the instructor nor being in the motivating classroom environment made the third group feel disadvantaged from the very beginning, thus creating resistance towards the new system (i.e. TTeLP). One reason behind students' negative perceptions could be associated with their use of digital technologies. In a study by Lai and Hong (2015), it was revealed that university students used a limited number of digital technology tools for university and social/personal activities. It is necessary to design e-learning environments to deepen students' engagement in academic activities (Kim et al. 2019) to make e-learning more effective. Consistently, Yıldız (2020) reported that college students were unwilling to log into the online learning system and felt low motivation because they did not know the system itself. Therefore, this issue requires further investigation because the use of digital technologies could have affected students' perspectives of the e-learning platform for learning architectural history.

The most accentuated disadvantages were the provision of too-much and too-detailed information and tasks, lack of comprehensive feedback, challenges in being unfamiliar to the new tool, difficulty in filtering important information and concentration. As for providing too much information and too many tasks, filtering important information and concentration, it might be useful to consider Lim's (2002) suggestion to focus on constructing instructional content that is simple enough to be applied in studies of students and tasks. These issues were perceived as problematic by students. Some of these issues were identified by the Hara and Kling (1999) who revealed that students felt frustrated during online learning because of technological problems, minimal and untimely feedback from the instructor, and ambiguous instructions on the website via e-mail.

Furthermore, the first independent learning experience without teacher guidance caused students to feel worried and hold negative perceptions about the system. This could be one of the drawbacks of e-learning because students are deprived of clarification, explanation, non-verbal clues and observation of the interaction between others (Al-Musa and Al-Mobark 2005; Al-Qahtani and Higgins 2013). This situation is typical because students assume the role of active learners who construct, transform and extend their knowledge and who are responsible and accountable for controlling their learning in interactive multimedia learning environments (Vogel and Klassen 2001). Another reason, however, was the students' expectations of the system's contribution to their preparation for the examinations needed to succeed in the course. In this regard, Ally (2008) argues that the lesson's learning outcomes should be specified and that a variety of learning activities should be organised to attain these outcomes and to cater for the individual needs of students. Hence, the e-learning platform was unable to meet students' needs for examination preparation.

Similar to the other two groups, this group favoured teacher guidance. This issue was emphasised by Al-Qahtani and Higgins (2013) who argued that the physical absence of

the teacher could be perceived by students as a disadvantage if they are more accustomed to a traditional approach. Eze et al. (2018) also found that lecturers believed that e-learning cannot be a substitute for face-to-face learning; rather, it can be complementary. Furthermore, students' adaptation period to a new digital system, feeling worried while trying to learn on their own (especially figuring out the important parts for the examination) and concentration problems reinforced their psychological barriers, which were also among drawbacks noted in previous literature (Akkoyunlu and Soylu 2006; Hameed et al. 2008; Klein and Ware 2003; Lewis and Orton 2000). Also, from the TTeLP system logs of student usages, lecture content, especially tasks and quizzes, were not fully covered by students. This might have overshadowed the anticipated efficiency of the e-learning system and led to disadvantage among the third group of students.

Participants made some recommendations about enhancing the effectiveness of the e-learning system, including providing online interaction hours, publishing answers to set tasks and quizzes, adding educational games, providing rewards to those completing the tasks successfully, increasing the number of quizzes, tasks and group-work activities, organising quizzes as pretest and posttest applications, providing virtual bonuses and forming a competitive environment. Most of the student recommendations were related to increasing the attractiveness of the e-learning platform. Consistent with this finding, Jowallah (2008) found that students taking part in technology-supported learning in higher education requested the improvement of the attractiveness of the online tasks.

In the current study, some students specifically identified the positive effects that gamification of the teaching/learning process can have for their learning. Virtual bonuses, nurturing a competitive environment, adding educational games, and rewarding are some of the elements used in gamification. Gamification, or the use of game design elements in non-game contexts (Deterding et al. 2011), affects student achievement positively (Yıldırım and Şen 2019); and gamification-based teaching practices were linked to student achievement in tertiary education (Yıldırım 2017). In a systematic review by Subhash and Cudney (2018), gamification and game-based learning made significant contributions such as improved student engagement, motivation, confidence, attitudes, perceived learning and performance. Drawing on previous research and student perceptions in the current study, gamifying the e-learning platform could help students to use it more effectively and hold more-positive thoughts about the system during learning time.

This research was not exempt from some limitations. First, because the data were collected from a small group of participants results cannot be generalised and should be used with this limitation in mind. Because data were collected by using focus-group interviews, some other data-collection techniques such as questionnaires, experimental designs, observation, longitudinal research and participative action research could offer further insightful results regarding different learning/teaching approaches. Further research could focus on the effects of participating in different learning/teaching approaches on student achievement, attitudes towards learning and metacognitive awareness.

Conclusion

Taken together, our findings suggest that the three teaching/learning approaches had both contributions and limitations for participating students. Although students felt safe and happy in the face-to-face approach, still they emphasised their need for the TTT digital tool as a supportive companion in the course. They believed that such a digital tool could

mitigate the negative aspects of face-to-face instruction. Students who participated in the technology-supported face-to-face instruction group perceived themselves as the luckiest group because the digital tool helped them to learn more effectively and because teacher guidance was important for them. This approach was seen to balance teacher and technology roles. The e-learning group had negative experiences to some extent, partly because of departure from the usual approach in the courses. Being responsible for their learning for the first time was frustrating for some students. However, they still found the e-learning system beneficial for nurturing new sights into learning independently.

The TTeLP, or e-learning platforms in general, is not for everyone because different students have different learning approaches: some learn on their own better, while others desperately need a tutor. Therefore, one of the main conclusions of this study is that the TTeLP could be used as a supplementary resource, while not necessarily taking over the role of an instructor. It could be used by students who are not good at in-class learning (not concentrating on what the teacher says, for instance), by those who do not have the opportunity to access particular course content, or by those who cannot attend regular face-to-face lectures.

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