Enhancement of Critical and Analytical Thinking in the Context of Interior Design History

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ABSTRACT

Through this study, a pedagogical case study was developed, implemented, and disseminated in which students applied interior design historical contexts to a studio project based on Beecher's design history education framework suggesting that design history should be taught to engage students in critical and analytical thinking and to integrate the knowledge gained into current design applications.[1] Students were asked to develop an exhibition design installation (Application) as a team project based on the team's analysis of a design topic or artifact of its choice (Analytical/Critical Thinking) from the existing 1885-1925 exhibition (Accessibility). A focus group study was conducted to investigate students' perceptions regarding design history while they worked on this project and then to investigate learning outcomes once they had completed it. Intellectual engagement and learning progress were observed in the students; these may have resulted from the integrated application of the material within an actual design problem. Three major learning outcomes: engagement, critical/analytical thinking, and understanding of design history in multidimensional contexts, were observed. Additionally, students experienced positive aspects of design skill learning due to the actual installation of the project. This study provided a comprehensive view of how the students responded to interior design history in their design problems.

An anecdotal pedagogical experience in design history illustrates concerns about students' learning and misperceptions about design history in interior design curriculums. Brandt states:

as incoming majors commence the first of a four-course sequence in the history of interior architecture, furniture, decorative arts, and textiles, their faces register the same looks of trepidation that their predecessors wore. 'What is your greatest concern about undertaking this class?' they are asked to indicate on a note card. 'Memorizing dates,' one responds. 'Not being able to remember images on slide exams,' replies another. 'Mixing up different styles and periods,' notes a third. Articulate about voicing their fears, they are less expressive when asked to describe what they most look forward to as the semester begins…. Discussions with colleagues, ranging from design historians to studio instructors and guest critics, suggest that today's students still fail to make the connection between the study of the artifacts of their profession's past and their approach to tackling a studio assignment…. Conversations with students reveal that many view history as irrelevant, intimidating, and frankly uninteresting.[2]

This notion of students' perceptions of irrelevancy and lack of interest in design history could result from many reasons. Interior design via 'reality' TV is portrayed as a decorative profession. Many designers treat historical contexts as stylistic and decorative elements for personal and intuitive artistic taste, whereas interior design is formally recognised as a multi-faceted profession that deals with creative solutions for functional, socio-cultural aspects and aesthetic values for users through a complex design process.[3] It seems that the pedagogy of design history education, in which conventional instructional methods tend to be isolated into visual context areas, linear relationships, causes and effects, chronological order, and memorisation, consequently fails to prepare interior design students for the professional workforce. From this perspective, design history is seen as static knowledge and is not relevant to complex contemporary interior design practices for the 21st century.

This perceived irrelevancy of design history has been reflected in many areas. For instance, *The Interior Design Profession's Body of Knowledge: 2005 Edition* reports that the perceived value of design history among design practitioners is quite low. Additionally, historical contexts were excluded from the National Council for Interior Design Qualification Exam, and instructional goals of the design history curriculum in the Council for Interior Design Accreditation (CIDA) *Professional Standards 2006* provided a lack of clarification on pedagogical impacts of design history education.[4] This has worried many educators, and *CIDA Professional Standards 2009* reflects this concern very well. One of the most notable changes in the standards is 'critical thinking,' recognised as one of the most vital elements in interior design education,[5] and multidimensional aspects of design history are emphasised by devoting a single set of standards to history.[6] Many design historians and educators suggest that pedagogical efforts emphasise that design history should be taught to develop students' analytical/critical thinking, be viewed as multi-faceted, and provide historical precedents to inform design decisions.[7]

This idea of rethinking design history pedagogy has been acknowledged by historians since 1996 at the Cornell Symposium, the first historian symposium to discuss history education and its relationships to design studio education. In a follow-up survey to identify profiles of history teaching among four-year FIDER (Foundation for Interior Design Education Research and now CIDA) accredited interior design programs, results indicated that 60% of history professors teach one or more design studios, that most history courses are reorganised consistently to make the history relevant to other design courses and/or studios, and that '66% of design programs require three to five courses in interior design history, plus art or architectural history or both.'[8] Despite these efforts, historians perceived a lack of integration between history and students' design work. As a follow-up to the symposium and survey, a thematic issue of *Journal of Interior Design in 1998* disseminated extended dialogues on interior design history education. In this publication it was stated that interior design history tends to focus on the chronology of stylistic classifications and that Eurocentric designs should be reconsidered. Design history education

for the 21st century should cover 'the dynamics of history as making a major contribution to students' creative processes and critical thinking.'[9] This idea is well reflected in CIDA *Professional Standards 2009*, and this research embraces it.

Therefore, this study hypothesised that offering different pedagogies by engaging students in analytical and critical thinking within a hands-on design project as a team would enhance student learning in multidimensional aspects of design history. Through this study, a pedagogical case study was developed, implemented, and disseminated in which students applied interior design historical contexts to a studio project based on Beecher's design history education framework suggesting that design history should be taught to engage students in critical and analytical thinking and to integrate the knowledge gained into current design applications.[10] A focus group study was conducted to investigate students' perceptions regarding design history while they were working on an interior design studio project and then another was conducted to investigate learning outcomes once they had completed the project.

LITERATURE REVIEWS

Although teaching chronology and Western-Eurocentric design history provides interior design students with useful information to identify design and stylistic movements of Western Design, terminologies, details, and techniques that are also important parts of CIDA Standards 2009, it conflicts with 'the concepts of diversity and multiculturalism'[11] dominant in 21st century professional interior design education. Historians believe that non-chronological and analytical aspects of history could enhance students' abilities in problem solving.[12] Architectural history studies share a notion of material culture study that seeks iconographic patterns and symbols in determining meanings and cultural values. From this perspective, interior design history should be 'dynamic; conceive of objects as events, not things; and emphasise the relationship of an object to its environment.'[13] History provides great opportunities for students to learn precedents of dealing with complex issues and critical/ analytical thinking. Some historians claim that history should be

a departure of innovation and creative inquiries. In this regard, history is viewed as unfinished and speculative. Attiwill suggests that history should become 'a question of building a platform for arrivals and departures where the emphasis is not on finding and fixing meaning but on making sense, on producing and inventing.'[14] Findeli suggests that design history education, eventually, 'should lead the students to develop their own philosophy of history and, consequently, to be able to adopt a critical attitude to such ideologically loaded concepts as progress, avant-garde, innovation, outdated, historic preservation, revival, etc.'[15] Jennings claims that interior design history associated typology based on multidimensional aspects such as use, morphology, function, cross cultural, aesthetics, etc. that are time and place specific and are socio-cultural contextual, could promote critical/analytical thinking. Such an approach would allow students to connect history to contemporary interior design practices. Brant also found that a thematic approach, such as conceptual, aesthetic, and technical aspects in nature, can engage students in critical/ analytical thinking and promote positive student learning experiences in design history courses. Analytical thinking helps a designer to explore and clarify design problems, and critical thinking supports evaluation of a problem and exploration of solutions.[16] Meneely and Portillo found that student engagement in critical/analytical thinking resulted in higher levels of creativity in a design problem. However, as Meneely indicates, critical and analytical thinking are less preferred and tend to be avoided or overlooked by interior design students in the design process. Beecher also claims that 'lack of integration between history and creative experience gives students the impression that historical designs are remote and irrelevant to their work in design studio.'[17] Therefore, careful instructional methods are necessary to engage students in critical/analytical thinking.

To overcome this problem, Beecher proposed a new pedagogical framework that promotes critical and analytical thinking associated with multidimensional historical contexts, such as political, cultural, social, and/or technological factors, and students' design history knowledge that should be integrated into their design applications. Three pedagogical aspects, *accessibility*, *analytical/critical thinking*, and application of interior design history

are proposed for better learning outcomes.[18] This research follows up Beecher's pedagogical model by implementing it into a design studio.

Accessibility refers to familiarity and its relationship to history and students; it is critical to engaging students in the analytical process. For instance, 'giving students opportunities to find signs of the past in their everyday lives and surroundings and making connections between historical conditions and contemporary everyday life are important means of presenting an accessible history.'[19] Analytical perspectives of multidimensional aspects such as socio-cultural, physical, political, and economic issues, moral and spiritual beliefs, etc. should be used to improve critical thinking skills. This non-linear, analytical approach may enhance the applicability of history in the studio and engage students in critical/analytical thinking; in turn, it may enrich the interior design curriculum. 'Understanding the designs of the past through the application of an analytical and critical process offers students an opportunity to define, compare, and evaluate their own projects within a contemporary context.'[20]

In critical thinking, engagement takes a vital role in the thinking process and it is strongly associated with emotional aspects that include risk taking, emotional discomfort and challenges, affective pleasure in the problem solving process, and meaningful outcomes.[21] Carmel-Gilfilen and Portillo explained that critical thinking is crucial in the problem solving process and involves not only a cognitive dimension, but also an emotional dimension and affection, attitude, and maturity dimensions.[22]

This notion of an emotional dimension in engagement is shared by others. Beecher suggests that instruction pedagogies should facilitate the engagement of students in positive learning experiences. Spendlove argues that emotion, known as 'Emotional Intelligence,' conceptualised as an overarching concept within a triadic schema (person, process, and product) of art and design education and as the ability of self-disciplined and self-motivated risk taking, takes a vital role in engaging students in positive, creative learning. Triadic Schema theory emphasises 'developing

emotional capacity in the learner to engage in a creative process (person); stimulating emotional engagement through appropriate learning contexts (process); facilitating the emotional interfacing of the learner with the outcomes of a creative process (product).'[23]

PROCEDURE

A total of 32 students enrolled in a junior level interior design studio participated in this project as an outside classroom team assignment. Most students had taken at least one art history class previously and were taking an interior design history course concurrently. Each team consisted of three or four members by drawing; a total of ten teams were formed. Each team was asked to develop an exhibition design installation (Application) based on the team's analysis of a design topic or artifact of its choice (Analytical/Critical Thinking) from the existing 1885-1925 exhibition (Accessibility). An exhibition of three-dimensional artifacts and architectural images, including descriptions, from the era was provided near the students' design studio throughout the semester (Figure 1). After viewing the exhibit, teams were asked to select and analyse an issue (controversial or educational) or a topic (artifact/building/design theory) of their choice from the period. A guest lecture on design issues in this era was also provided. Teams then planned in a designated display showcase an experimental exhibition and their design applications, which reflected their analysis and/or possible application of the findings. There were two showcases that were dedicated for the installation. Therefore, two teams were able to exhibit at the same time. For this study, the first two teams were considered as the First Group, the next six teams as the Middle Group and the last two teams as the Last Group. Each team had approximately two weeks to complete its project and was required to present the project in a PowerPoint presentation during class. While students worked on the group project, a focus group study was conducted. The sample was a convenience sample with students voluntarily responding to email and verbal requests. 28 students volunteered for the first interview. One additional student volunteered for the second interview, making a total of 29 student participants in that interview. Extra credit points were given as an incentive to volunteers; an alternative means of obtaining credit was offered to

those who chose not to participate. The participating students were divided into six groups of three to six students each, primarily so that team members were in the same group. In this way, the students within each group could discuss their projects and learning in more detail. Two interview sessions were conducted with each group. Each session took approximately 30 to 50 minutes, depending on the level of student involvement. During the first session, the subjects discussed perceptional opinions on design history with a moderator while they worked on the project. The second session was conducted after completion of the project to investigate any perceptional changes on design history and to record students' learning experiences. The moderator provided participants with an information sheet that contained an informed consent form, which the participants signed. The data were video-recorded and then transcribed. The data was categorised and themes were merged into categories to identify learning outcomes of design history related to the studio project and interior design students' perceptional changes on design history.

FINDINGS AND DISCUSSION : PREVIOUS DESIGN HISTORY COURSE EXPERIENCE AND PERCEPTIONS

Of the 28 participants who volunteered for the first interview, 25 had taken an art history course in their first year; 21 had taken an interior design history course, an elective that covers topical and critical issues after the year 1900; and 22 were concurrently taking a required interior design history course that covers architectural history and furnishings prior to and including the 18th century. Students perceived that instructional methods of the art history course and the required interior design history course are often lectures with slides in a chronological approach, whereas instructional methods of the elective interior design history course are lectures and discussions to cover contemporary design issues rather than historical contexts. In the art history course, major

assessment tools were exams based on memorisation using 'fill in the blank', matching, and multiple choice questions. In the interior design history course, additional assignments such as research papers and weekly quizzes of matching, short answer, and multiple choice questions, were required. Most of the 26 students had no experience with history-related projects (two students did). One of these students had taken a historic preservation course and the other had done a team project in which students developed a design concept from an art-piece as an inspiration that required research on historical contexts in a creative problem-solving course.

Based on the interviews, most students (23) feel that design history is important. They are aware that history influences contemporary design and design decisions and that it provides precedents. For instance, one stated:

> I think design history is very important just because we have the old saying of history repeats itself…. I believe that what we learn in history or why we have the classes is all pieces or all furniture or all aspects of an architectural building are going to at some point resemble or mimic an older piece so if you have design history then you are informed about how these pieces relate to each other and how you can use them, and what time period they came from so you can relate that to the design aspect.

This student is aware of the importance of history, but he or she understands historical contexts as a simple form and as a cause-effect relationship. Students participating understood design history as visual references of specific styles or as foundational knowledge, rather than as complex contexts of design precedents. For instance, students said that design history knowledge is useful for communication with clients when historic styles are considered:

> I think it is important because a lot of people want antiques and stuff incorporated into design, and you need to be able to differentiate between time periods and different pieces. I think having design history helps because when you talk to a client they may not know specific terms for things so if they say 'that little pointed thing over there' you can kind of get an idea what style they like even if they can't say what they like.

These statements may indicate that this perception of the linear and ornamental aspects of interior design history have resulted from the current design history curriculum that focuses on chronological and stylistic contexts of design history. This limited view of design history education is reflected by students' perceptions on the importance of design history knowledge in design practice and in securing employment. The interviews found that although students consider design history important (19) in the practice of interior design, they think it is less important (16) than other design related knowledge (Table 1). Also, students' perceptions on possible applications of design history knowledge is limited to certain design areas in which visual references are the main concerns, such as design history specific projects (10), historic preservation (8), museum design (3), and movie set design (1). Only three respondents indicated that design history provides designers with precedents to inform design decisions.

Importance of history in general (23*)		Importance of design history knowledge in the practice of interior design (22*)		Importance of design history knowledge to get a job (22*)		Importance of design history knowledge compared with other design related knowledge (20*)	
Important	23	Important	19	Important	14	More Important	3
Not important	0	Not Important	3	Not Important	8	Equal	1
						Less Important	16

*number of actual respondents

The study revealed that attitude of instructors, in-depth information on a topic covering its background, activities such as field trips and/or research papers, and various types of assessment tools are the things that hold students' attention and make the course interesting. Students indicated that hands-on experiences make a history class interesting and help them retain more information.

In addition, students feel it is difficult to retain information when the assessment tool is based on memorisation, such as defining and matching images on a test. One student stated:

… the art history class my freshman (first) year [sic] we just had tests and when you are learning so much information it is hard to retain because I just had like my short term memory and I crammed for tests and in heritage I do forget a lot of it because you are cramming so much and we have so many tests.

The interviews found that students thought they would gain a great deal of positive learning and retain more information if the outcomes of history courses were tangible and applicable:

… [i]n design classes it is all tangible and you can draw it and you can do whatever, but I feel like in our history classes here it's all like write it down write it down write it down look at a picture write it down. ….it is helpful when things are more tangible....

Most students (26) had no experience applying design history to a studio project and they felt the project would offer them positive learning experiences due to its tangible, hand-on approach. Some students indicated that it would be beneficial for their education if other aspects of design, including technology, materials, and finishes, were covered in design history courses. This may indicate that students perceive instructional contexts in interior design history courses as dimensionally limited.

LEARNING OUTCOMES AFTER PROJECT COMPLETION

Three major learning outcomes associated with design history education were observed: engagement, critical/analytical thinking, and understanding of design history in multidimensional contexts (Figure 2). Additionally, students experienced positive aspects of design skill learning due to the installation of the project.

	SHOWCASE #1		SHOWCASE #2	
FIRST GROUP		Charles Darwin and His Influence on Art Nouveau: scientific discovery (the theory of evolution), its controversy, and its influence on design Design Application Focus: Style – Art Nouveau		The Effects of the Industrial Revolution on Modular Design: The Industrial Revolution and its impact on design Design application focus: Building Technique, Modular Construction (Grand Central Station)
MIDDLE GROUP		Filament Technology Advancements Through the Incandescent Lamp: invention of the light bulb and its technology advancement Design application focus: Technology and History		Eclectic Revival: World War I and the movie industry affecting building styles in California Design application focus: Style, Theme
LAST GROUP		Le Corbusier: The New Spirit, Success from Scandal: social issues, styles, technology, controversial reaction Design application focus: Theme, Multi-directional, Critical Issues		The Jazz Age: art and culture reflecting critical issues in social and political changes (the great migration, women's rights movement, Cubism & Dadaism, alcohol prohibition) Design application focus: Theme, Multi-directional, Critical Issues

Opposite
Table. 1: Student perception on design history (28)

Above
Figure 2: Student outcomes (Design Application)

Engagement : A high level of student engagement was observed, and students found the projects fun and exciting. Several factors increased the level of engagement. First, the aspects of the three-dimensional hands-on project positively affected students' engagement in the design process. As one student stated, students had never before done this type of history project; a tangible 3D installation to be viewed by others made students more engaged and excited and, therefore, they retained more information:

> … having to take those steps like you do the research and then try to find of way of illustrating and then the actual building; it helped me remember the information.

Secondly, students chose topics with which they were familiar and developed more detailed information. This may have engaged students and promoted intellectual curiosity and teamwork:

> I think it was cool because we got to research kind of what we wanted to; we didn't have to do the parts we didn't want to do. Like we didn't have to do the war necessarily or like … we kind of centralized on the ones we thought … most exciting.

Students chose thematic topics that addressed multidimensional issues such as controversial, socio-cultural, and/or political issues. One student from a group that chose a music type, jazz, stated that she was highly engaged and excited after overcoming multiple problems:

> … there was a point early on once where we had kind of picked our idea but it was hard to figure out what we were going to research because we had come to [the] idea of jazz. … Then once we got into it we were like wait a minute not all these ideas are in our time frame or really going to work for this. So now we really have to research jazz and figure out what it is about and I was a little scared that we weren't going to find anything that was going to come back together and make a cohesive statement about that time period. Then all of a sudden these little things started popping up and it all started fitting into place and that's when it kind of got exciting.

This statement suggests that multidimensional topics with which students are familiar challenge them with intellectual engagement and this, in turn, leads to positive learning experiences. This supports Spendlove's framework [24] that 'emotional intelligence (challenge)' is an important contributor to a positive learning experience.

Critical/analytical thinking: Additionally, critical/analytical thinking skills within historical contexts were enhanced. One student indicated his or her feelings upon seeing another group's project before his/her group's work was installed:

> I saw that our work is way off. We are not even on the right track, but I learned that there are different styles and that people do think differently and that people have different ideas.

This statement indicates that he or she realised that alternative ways of thinking and presenting a design are possible. Although students did not specifically address 'critical thinking and its impacts' on design history, one student of an early group that chose Art Nouveau as a topic and ended up researching Darwin's evolution theory indicated that he or she gained critical the insight that design has been influenced by diverse factors:

> Darwin didn't only influence the way people were thinking but also the way of design. Which [sic] I had no idea that he had an effect on design, and not only that but [sic] the design was controversial like a lot of people loved it or hated it just as like with Darwin they either loved him or hated him. So that was kind of neat.

Students also gained problem-solving skills even though they received limited resources for the project including: groups choosing their own topics in the design period, only a two week time line, the physical site contained to display showcases and the need to utilise critical or design issues associated with design history. No specific requirements regarding format of presentations were given. Each group encountered unique challenges to solve, which required teamwork, problem-solving

skills, time management skills, and communication skills. As a result, students indicated:

> (I learned) problem-solving (skills) definitely [sic]. (I learned) working with others…, overcoming obstacles and having to decide what to do and consult with each other.

This study therefore suggests that design projects associated with critical issues in design history may stimulate students' intellectual curiosities and that multidimensional investigations may spur critical insights. Although each team's display arrangements were somewhat influenced by the other teams due to the available visual examples, design applications and approaches to the topics were quite varied.

> History as multidimensional contexts: Design results and student responses indicate that students gained more understanding of design history when it was presented with a holistic view and in multidimensional contexts. Students perceived design history as a multidimensional and complex entity, in comparison to the first discussion. In the first group of installations, students tended to focus on specific topics more directly related to interior design, such as design styles or building technology. In the middle group, students tended to pick a topic with a broader range, such as World War I and its impacts on building styles, the light bulb's advancement, or the Chicago World's Fair. Students began to see connections between multidimensional historical contexts and their influence on design. However, student topics and design applications were still more of a direct implication of the topic they chose. For instance, the exhibition of the group that chose incandescent light bulb development as its topic focused on the bulb's developmental phases rather than on its influences on current design industries. Student discussion of issues during each group's presentation extended students' cognitive boundaries. In the final group of installations, students successfully demonstrated an understanding of design history as a dynamic system of multidimensional contexts. Students demonstrated that design history is evolving as a result of complex interactions of social, cultural, political, and/or technological factors. The project titled The Jazz Age reflected the holistic understanding of design as an art form reflecting social,

cultural, and political contextual changes of that era. The topics covered included individualism, alcohol prohibition, women's rights, Cubism and Dadaism, and the great migration:

> I learned a lot about the time period that we did. In just history in general I thought it was very exciting. …we did a specific time period and what was going on that made that time period so important and I don't think I had realized the connection of the events of that time. Like world war one with prohibition and with women all of sudden [sic] being able to vote and looking at it as a whole as well as in parts kind of made it nice because I didn't see the whole originally.

DESIGN MEDIA SKILLS

Students were eager to present their displays, and they gained new design media skills. Students also integrated into the project design skills and knowledge they had learned in previous classes. The aspect of a three-dimensional, life-size installation and a team-based project that required communication among members contributed to students' skill development. Students said they learned visual communication skills including Photoshop®, legibility, 2D/3D composition, presentation, and model-making skills:

> [w]e did learn more about 3D space because I think that is something that we are not really used to dealing with because we are working with everything on paper. Even though we are doing floor plans and kind of looking at it that way I think you actually saw how you had to change things or find something different to fit.

Students tended to apply their new knowledge to a design solution as thematic, which Beecher suggested as a pedagogical technique to improve learning outcomes. Students engaged in the early process said that the project was challenging for them due to the lack of examples. Although the level of engagement was high, students stated that the lack of accessibility to critical issues was a major challenge.

Despite the benefits and positive learning outcomes, students still perceived that history is less important than other areas of knowledge in becoming an interior design professional and that this type of project does not improve their employment prospects. This may indicate that although students' critical thinking and design skills may be enhanced by a design history project, they still perceive design history as less relevant to interior design practice and, therefore, contributes less to job readiness. Also, it appeared that students might perceive that a good portfolio providing visual representation of design skills is a major tool to finding a job. This may indicate that students perceive that other aspects of design, such as critical and analytical thinking, are not important criteria to securing a job. One student stated,

> I don't know if this project necessarily made me feel competitive; I think it was more that we just really enjoyed the project. It was fun to actually get to see it in the display and materialized and … see how it all fit [sic] together. As far as putting in a portfolio … the image you don't see the sides of it and it's not the same as standing in front of it and a lot of the research points we made in the presentation and that again is kind of hard to capture in a portfolio so it is definitely something I will take with me but I don't know how much it is of a selling point to someone else that I did this.

This statement suggests that covering multidimensional aspects of history and implementing them throughout the interior design curriculum may increase appreciation of history among interior design students and practitioners over time. It also suggests that the topic of history in CIDA Professional Standards 2009 might be categorised in Section II, 'Critical Thinking, Professional Values, and Processes,' instead of in 'Core Design and Technical Knowledge.'

CONCLUSIONS

This study demonstrated that interior design studio projects incorporating interior design history have benefits for student learning of design history. First, students can be highly engaged in the problem-solving process due to hands-on experiences that most students favour. Such problem-solving enhances student intellectual skills in analytical and critical thinking. Second, design history is understood as live, continuing events that are evolving and that result from complex interactions of multidimensional factors (social, political, cultural, and/or technological). The purpose of design is to solve human problems within the built environment. Therefore, design history knowledge that has examined multidimensional contexts will assist professional interior designers in solving current design problems.

Finally, student feedback indicated that introductory information regarding critical issues during the era should be added to improve accessibility and student engagement. Development of easy access to curriculum materials, such as a website with introductory critical issues, might reinforce active learning. Careful project scheduling to increase student engagement was also suggested. In this studio, students did the project outside the classroom, although each group had opportunities to get the instructor's feedback. However, it appeared difficult for a team to find outside class time that met every member's schedule due to commitments such as jobs, other school events, and other homework.

To investigate students' perceptions regarding design history while they worked on the interior design studio project and to investigate learning outcomes once they had completed the project, this study employed focus groups conducted before and after the interior design project. This study involved interior design students in one studio class. A survey with a larger sample and statistical analysis would increase the external validity of the findings.

NOTES

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