Beginning Level Interior Design Students' Perceptions and Use of Research in Design Process

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Abstract

This study was focused on beginning-level interior design undergraduate students' perceptions, experience, and use of literary research. The data were collected through a questionnaire that was administered to 67 students. The findings indicated that the majority of the students searched for information in their classes, and the participants were aware of the importance of research. However, only 63% of them reported using credible sources in their literary research, and less than half of the respondents knew what a peer-reviewed journal article is. Based on the findings, it was suggested that students need to develop skills in conducting literary research using credible sources, and they need more exposure to research-inspired design and a wider range of topics that they could research in interior design. The findings could be used to develop new teaching strategies and to improve assignment handouts related to research-inspired design in interior design education.

Keywords

research, interior design, evidence-based design, beginning-level

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RESEARCH BACKGROUND

By using the most up-to-date information available from research; designers, architects, and clients can make better informed decisions and create environments that are better for the inhabitants. For example, Ulrich (1984) famously found that staying in hospital rooms with views of nature positively influenced the surgery patients' recovery. Since then, evidence-based design has gained recognition in not only healthcare design but also in the design of all types of settings. Collecting information is an essential part of the design process. In fact, Council for Interior Design Qualification (IIDA, 2019), which is the premiere certifying organization for interior design professionals, defined interior design process to include "research, analysis and integration of knowledge into the creative process…" (para. 1). According to Hamilton (2003), practitioners should make an effort to stay familiar with the current literature in the design field. We spend a significant amount of time in interior settings whether it is our homes or work environments. Using existing body of literature, interior designers can design environments that could improve human well-being and increase our satisfaction with the environment. Furthermore, in the information age, designer's credibility and ability to sell their design ideas could be increased, when the designer backed their approach with research (Guerin & Dohr, 2007).

Many researchers emphasized the importance of integrating research in the interior design education (e.g., Dickinson, Marsden & Read, 2007; Dunlap, 2011; Fowles, 1992; Guerin & Thompson, 2004; Harmon-Vaughan & Wiens, 2001; Hasell & Scott, 1996; Nussbaumer, 2009; Robinson & Parman, 2010). For example, Gibson (1994) argued that integrating research process into class projects improved students' critical thinking. Dickinson, Marsden, and Read (2007) surveyed 89 interior design students from three research universities. They (2007) found that although the students believed research findings to be useful for interior designers, most of them were not interested in taking a course on research, and only 13% of them reported taking a class that covered research in any form. The authors (2007) concluded that the students did not receive enough exposure to the importance of research in the design process at the undergraduate level. It is interesting that those students believed the importance of evidence-based design in interior design, and they still lacked willingness to learn about research.

In addition, Dickinson, Anthony, and Marsden (2009) surveyed 65 interior design educators. The majority of their respondents reported that their students had difficulty understanding research studies they read. Some educators hesitated "as to whether undergraduate students should be taking research related coursework" (p. 11). In addition, despite its significant role in the design process, Guerin and Thompson (2004) argued that many designers did not use scientific research in their design process. Lastly, Dazkir, Mower, Reddy-Best, and Pedersen (2013) found that the beginning-level interior design students struggled locating appropriate and credible sources while conducting research for their culture-inspired design project. All those findings indicate that students either did not have a good understanding of research-inspired design, or they lacked motivation to do literary research in their design process.

Some example studies providing evidence-based design solutions include positive influence of daylighting on hospital room occupants (Walch et al., 2005), positive effect of live plants and window views on job satisfaction in office settings (Dravigne, Waliczek & Zajicek, 2008), effects of color and view on mood (Stone, 2003), and effects of physical environment on behaviors of residents with dementia (Mobley, Leigh, & Malinin, 2017). Evidence from such publications can be used by design students to justify their design decisions or improve their design outcomes depending on what type of design project they work on.

CURRENT STUDY

The purpose of this study is to investigate beginning-level undergraduate interior design students' perceptions, experience, and use of literary research. Please note that research-inspired design does not necessarily involve collection and analysis of data. It can be a search of information from credible sources and use of that information while making design decisions. The research question for this study is: What are the beginning-level interior design students' perceptions of research and experience with literary research?

With this study, we can learn whether students recognize the value of research and research-inspired design, what type of literature review experience they have, and whether they have skills to locate reliable sources. The findings of this study can lead to a better understanding of when or whether beginning-level

interior design students are exposed to much needed literary research skills in their academic education which in return, can be used to develop or improve teaching strategies. When students have information literacy and value research-inspired design, they can help design better environments for people in their future professional career.

METHODOLOGY
Sample
The recruitment and data collection started after the Institutional Review Board's approval was granted. The participants were undergraduate students enrolled in a studio course in a CIDA accredited interior design program at a southeastern U.S. public university. Sixty-seven students participated in this study throughout six semesters (three years). The age of the respondents ranged between 19 and 59 (M = 21.4; SD = 5.17). The majority of the respondents were white (84%), followed by African-Americans (7.5%). Ninety-six percent of the respondents were females (n = 64). When asked about how many years they spent in college, the responses ranged between one and 10 years (M = 2.71; SD = 1.28). Eighty-five percent (n = 57) of the participants reported spending three or fewer years in college. Fifty-five percent (n = 37) of them were juniors, followed by sophomores at 34% (n = 23). Only one student reported being a freshman.

All 67 respondents were recruited from Studio I, which was a beginning-level lab class that was focused on drafting and foundational interior design knowledge. The participants entered the program through an application process, and once they were accepted into the program, they were expected to graduate in five semesters, taking one design studio class every semester. All of the participants had been required to take some of their core classes, certain art classes, and an introductory-level interior design class before starting the interior design program and taking Studio I. In this introductory design class that students took before studio I, they learned about the design process through lectures and a small design project that required them to narrate their design process and search for information on the project client and materials.

In addition to Studio I, during their first semester in the program, students could enroll in two other interior design courses including a class that was focused on materials, and this class included a literary research project that resulted in a poster presentation. In Studio I, from which participants were recruited, students were taught about the design process, but they were not required to submit any literary research assignments. Interior design students were required to integrate literary research in their design process starting in Studio II, which they took in their second semester in the program.

Instrument and Data Analysis
The data were collected via a questionnaire that was administered in class at the end of each semester. With the purpose of exploring beginning-level interior design students' understanding, awareness, and use of literary research in their design process, the questionnaire included Likert scale and open-ended questions about:

- value of research,
- whether students had any experience doing literary research,
- if they used scholarly publications in their academic studies or in their Studio I projects,
- what topics they researched,
- what type of sources they used,
- what they learned from their research, and
- whether they used any of the knowledge they gained from their research on their design project.

The questions were developed using author's professional expertise. The first draft of the questionnaire was tested on three students. It was revised and tested again with eight students. For internal consistency check, a question about the value of research was reworded and asked again in a different part of the instrument. Spearman correlation test results revealed that the two variables were significantly correlated (r_s = 535, p < 0.001). Furthermore, the questionnaire included both open-ended and closed-ended questions which allowed internal consistency checks during data entry.

The responses from the questionnaire were entered in MS Excel sheets. They were coded and entered in SPSS for descriptive statistical analysis purposes. The open-ended responses were coded using summative and directed coding techniques (Hsieh & Shannon, 2005). Through data analysis, patterns and themes were established (Creswell, 2013) and discussed.

The limitations of this study include its small sample size. The findings are limited to the educational experiences and perspectives of the students from a single institution. It is not possible to generalize the findings to all beginning-level interior design students.

FINDINGS
Descriptive statistics were used for reporting results of likert-scale and dichotomous questions. The qualitative data analysis results were presented with the presentation of codes and themes. The findings were presented under two themes and sections in this paper: importance and value of research for the participants; and students' research experience and content of their research.

Importance and Value of Research
At the beginning of the questionnaire, the respondents were asked to rate the importance of literary research in the design process on a four-point scale (M = 3.54; SD = 0.56). Fifty-seven percent of the participants (n = 38) rated it as *essential*, 40% of them (n = 27) rated it as *very important*, and three percent of them (n = 2) rated it as *somewhat important*. Please see Table 1. The same question was re-worded and asked again at the end of the questionnaire, and the majority of them (55%), again, rated research as *essential* in the design process (M = 3.49, SD = 0.61).

The respondents were asked to expand on their responses and explain why or why not they believed research was import-

ant. The qualitative codes that emerged from the data explaining why research was important were:

- choosing appropriate interior materials (n = 17),
- reaching informed or improved design decisions or outcomes (n = 16),
- learning about client/user needs (n = 15),
- learning about regulations and codes (n = 8),
- expanding or finding ideas (n = 6),
- finding good/best design decision (n = 6),
- making informed decisions (n = 6),
- finding better solutions to design problems (n = 4),
- learning about project location (n = 4)
- learning about latest trends (n = 4)
- avoiding mistakes or undesirable design outcomes (n = 2)
- learning the function and use of space (n = 2)
- finding inspiration (n = 2)
- learning from others' successes and failures (*n* = 2)

Table 1: Responses related to importance of research, as asked in two different questions	Importance of research in design process	Importance of researching articles, web sources & books in design process
1. Not important	-	-
2. Somewhat important (%)	2 (3%)	4 (6%)
3. Very important (%)	27 (40%)	26 (39%)
4. Essential (%)	38 (57%)	37 (55%)
Total (%)	67 (100%)	67 (100%)
Mean (SD)	3.54 (0.56)	3.49 (.61)

The most popular code that emerged from the data was the need for doing research on materials (*n* = 17). The students outlined the need for learning about appropriate and safe materials and products for interiors. The popularity of this answer is likely to derive from the students' knowledge and experience from two other interior design classes (materials class and introductory design class) as explained earlier. The second most popular code that emerged from the data justifying the need for research was making informed decisions, making better design decisions, and reaching better design outcomes (*n* = 16). However, those important research-inspired design characteristics were reported by less than half of the participants. Their responses were more focused on learning about interior materials and user/client needs than making better informed design decisions for better outcomes. Although the students seemed to be aware of the importance of research, were they concerned about the credibility of sources when they did research for their classes? What type of sources did they use when they searched for information?

Some other responses justifying the value of research included the need for researching certain topics such as color theory, historic eras, cultures, and technical drafting. Other responses included clarifying thoughts, creating design concepts, individualizing design, the fact that research is needed in future career, and the fact that research makes design process faster and easier. One respondent believed that there was no need to do research in the early stage of their design education, and they would need to do research in their future classes:

> In the earlier studios, we are given more of the information out front so that we can focus on learning the actual process

of drafting and rendering. I feel like later on in the program, you need to do it yourself as no one will be there to tell you the answers in the real world.

Research Experience and Content

The students were asked if they knew what a peer-reviewed academic journal article was and if they could define it. Four students responded positively but had misconceptions of the nature of peer-reviewed journal articles, and one student could not define it. Forty-two percent of the students (*n* = 28) could correctly define or guess what they were, whereas, majority of them did not know what a peer-reviewed journal article was.

When asked if they had done any literary research for a project or paper before taking Studio I, 87% of them (*n* = 58) responded positively, and only nine of them responded negatively. Please see Table 2. Those findings indicate that although the majority of the students reported doing literary research previously, most of them were not aware of credible sources such as peer-reviewed publications. Among those who could identify what peer-reviewed scholarly journal articles were (*n* = 28), less than half of them (*n* = 11) reported using journal articles in their research. Among those 11 students who used journal articles, only four of them used articles for searching design related topics. The other sources listed by the students included websites (*n* = 51), books (*n* = 33), blogs (*n* = 10), library search engine (*n* = 6), and news articles or newspapers (*n* = 5). Google Scholar, encyclopedias, "edu" and government websites also each emerged one time in the data.

Table 2. Respondents' responses to research related questions			
Questionnaire items	N	Yes	No
Knew what a peer-reviewed academic journal article is	66 100%	28 42%	38 58%
Did research for a project or paper before taking Studio I	67 100%	58 87%	9 13%
Used peer-reviewed journal articles for their research before taking Studio I	67 100%	11 16%	56 84%
Searched for information (via online or print sources) for their Studio I design project	67 100%	36 54%	31 46%
If searched information in Studio I, searched peer-reviewed journal articles	36 100%	1 3%	35 97%
If searched information in Studio I, learned new knowledge from other sources such as websites, books & blogs	36 100%	34 94%	2 6%
If searched information from other sources in Studio I, acquired useful or applicable information for their project	36 100%	36 100%	0 0%
If acquired information from other sources in Studio I, used it on their design project	36 100%	24 67%	12 33%

Among 58 students who reported doing literary research before taking studio I, 30 of them listed design related topics when asked about their research topics, whereas others listed topics ranging from science, history, literature, politics, social issues, and etc. Among those 30 respondents who researched design-related topics, only four of them reported using journal articles, 10 of them reported using books, two of them reported using library search engine, and others listed using websites.

Forty-three participants (64%) responded positively when they were asked if they searched for information on the Internet or in print sources (books, academic articles, and etc.) for

their Studio I design project. However, when they were asked to expand on what information they searched for and what sources they used, it was revealed that seven of them counted using their Studio I textbook as research. As a result, 36 students out of 67 (54%) actually did research on various topics such as furniture dimensions, color schemes, materials, styles, color rendering, technical drafting, and etc. using sources such as magazines, websites, online blogs, Google images, books, social media such as Pinterest and Houzz, YouTube tutorials, and HGTV website.

Twenty-four out of 36 students (67%) who did literary research for their Studio I project reported using the information they gained from those sources (outside peer-reviewed journal articles) on their design project. One student explained, "The information I gained through research influenced me to get out of my comfort zone and design things I wouldn't normally do. This has made my designs more interesting." Another student reported that her research helped her choose furniture and accessories. In fact, four other students reported that their research was helpful with their furniture selection. The most frequently reported information that students applied on their project came from their research on interior materials and colors ($n = 20$), which was in line with the research they did in their other interior design classes.

Out of 36 students who reported doing literary research in Studio I, only one of them reported using academic journal articles, and that student reported using articles to search for information regarding accessibility and types of construction. However, she was not able to find any relevant information in the articles she found, and she ended up using information she gained from other sources such as books and websites on her project. Finally, although 36 participants reported acquiring useful and applicable information from their research, only 24 of them (67%) actually used it on their design project. It seems that some students failed to use the information they gained through their research.

Lastly, the participants who reported not doing research in Studio I ($n = 31$) were asked to expand on their response. Twenty-three students responded, and the most frequently given answer ($n = 8$) was the fact that they did not need to do research since all the information was given to them by their professor or their textbook. One student explained, "because this is an introductory learning class and we did not have an in-depth project." Other responses included lack of client information for the projects, the fact that they were not required to do research or they did not think about it. Although many students believed that there was no need for research, one student complained about her lack of research skills:

> None of my previous classes have required me to do a research paper. If they have, I have opted out and taken a zero solely because I don't really know how to do a research paper, and professors think students automatically know how to do them, and don't explain or offer any help.

In summary, the majority of the students were aware of the value and importance of research in design answering the first part of the research question. Eighty-seven percent of the students ($n = 58$), conducted literary research in other classes, and 42 of them (63%) reported using credible sources such as journal articles, books, and library search engine. Considering the fact that the participants were mostly juniors or sophomores, one expects those numbers to be higher. It seems that design profes-

sors should not assume that students are aware of conducting research using credible sources. In fact, out of 67 students, less than half of them knew what a journal article was, only 16% ($n = 11$) of them used journal articles in research, four of them (5%) used journal articles for doing research on interior design, and only one student (1.5%) used a journal article in Studio I. Websites were the most frequently listed sources in student research. Almost half of the students (54%) reported doing research and acquiring useful information from their research in their design studio class, and most of their research were based on topics related to interior materials. Those findings provide an answer to the second part of the research question.

DISCUSSION AND FUTURE IMPLICATIONS

The findings of this study provide an understanding on the beginning-level interior design students' perceptions of research and experience with literary research. This study showed that the participants lacked the much-needed literary research skills and the skills to incorporate research-inspired design in their projects. The findings indicated that the participants needed more exposure to evidence-based design in their lower-level classes. The students lacked information literacy, and they needed more exposure to doing literary research using credible sources such as peer-reviewed journal articles related to interior design. Those findings support the existing body of literature (e.g., Dazkir et al., 2013; Dickinson, Marsden, & Read, 2007). The students also needed more exposure to a wider range of topics that could be researched in interior design such as how the environment affects human behavior, health and emotions.

Although 36 participants (54%) reported acquiring useful and applicable information from their research, only 24 of them (67%) actually used it on their design project. It is interesting that students did not apply the knowledge they gained from their research. This was an unexpected outcome in this study. Because the instrument used in this study did not include any questions investigating this phenomenon, future studies through interviews could be focused on exploring this aspect. Future studies may also target a larger sample from multiple interior design programs. Lastly, interviews with educators can be used to investigate whether different teaching approaches would make a difference in beginning-level design students' use of research-inspired design in class projects.

As educators, we should not assume that beginning-level students have good information literacy. Knowing students' level of research skills, interior design educators could adopt better teaching strategies and improve assignments to teach the true value of research in design. Students could benefit from instruction on how to conduct research using credible sources before we expect them to integrate literary research in their design process. Peer-reviewed journal articles are important sources of information and as educators, we need to make sure that students know what they are and how they can be utilized in the design process. Research in design is more than researching finishes and colors. Thus, students should be encouraged to locate published studies related to a wider range of topics.

Some teaching strategies to address those issues can include incorporating lectures on how to conduct literary research and locate reliable sources. Lectures can include discussions on existing research-inspired design projects. Beginning-level design

students can be assigned to read and present research articles and case studies since evidence-based design and research on design precedents are significant attributions to the design process (Nussbaumer's, 2009). Project assignments can be more detailed and include instructions to incorporate credible sources in their design process, and students can be required to cite credible sources on their final project presentation boards. "If educators provide students with a format and basis for research that develops EBD, entry-level interior designers will bring greater knowledge to their employers" (Nussbaumer, 2009, p. xix). Such teaching strategies may increase students' awareness in research-inspired design, and they may ensure the knowledge students gain from their literary research gets actually used in their design outcome.

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