

PRACTITIONER-RESEARCH LEARNING: a study of adding research elements in fashion and textile design education

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Abstract

The effectiveness of applying practitioner-research as a practical learning technique for undergraduate students in Hong Kong majoring in fashion and textile design is evaluated in this study, which challenges the conventions of fashion and textile design education.

Educators are faced with problems of providing students with relevant subject-specific and transferable skills and knowledge as well as appropriate industry interaction. Undergraduate fashion and textile design students lack creativity and critical thinking skills, have less opportunities to engage in design research and have weak competitiveness in the future. By encouraging students to use research methodologies in design activities during class study, the study intended to implement practitioner-research in fashion and textile design teaching and learning. It has the potential to enhance students' learning capacities, enrich their learning experiences, and help them to become more competitive for jobs or future education.

The study is based on both qualitative research and quantitative surveys. We investigated the impact of the strategy, practitioner-research learning, on the overall academic development of fashion and textile design education, as well as student attitudes toward practitioner-research learning and overall performance of the learning experience. Four existing fashion or textile design subjects were upgraded by re-planning the subject syllabus, teaching schedule and assessment criteria. Finding design inspiration, idea testing, result in analysis/problem solving, facility use in lab/workshop, design development, design focus end-use, design interpretation design promotion, portfolio/report writing, and fashion and textile design research directions such as new materials, improving the manufacturing process, and creating better consumer experience were introduced, and outlined for students. Students were tasked with researching and creating fashion and textile applications with imparted design techniques and research methods.

From preparation to students' group design projects, this article chronicles and examines the entire process of upgrading subjects. It also uses surveys to assess the effectiveness of practitioner-research in improving fashion and textile design teaching and learning. In addition, it evaluates how well the expected student outcomes such as problem-solving, critical thinking, research skills, self-directed learning, technology application and mastery and assignment completion, were fulfilled based on subject instructor ratings and student course experiences. We can show how practitioner-research learning improves students' learning experience, transforms the way they learn, and makes them more creative in fashion and textile design based on the findings.

1. Introduction

As one of the design areas included in art and design, textile and fashion design subjects should attach to students' acquisition of knowledge and understanding of the cultural context as well as broaden the learning and teaching by referring to issues such as sustainability, business, marketing, social and other professional contextualizing themes Annan-Diab and Molinari (2017). Educators, on the other hand, face difficulties in equipping students with relevant subject-specific and transferable skills and knowledge as well as suitable industry interaction (Harvey et al., 2017). This study involved undergraduate design students with research-related activities that may improve their ability of problem-solving, critical thinking and enrich their learning experience (Darling-Hammond et al., 2014) and make them more competitive for employment or further academic development. Researchers aimed to teach the generic skills essential for personal development and professional practice in the courses through distinct modules with some works being integrated and finished in practice. As special emphasis is placed on research, critical analysis and written and vocal communication skills in to improve students' research abilities.

This study used the concept of practitioner-research to upgrade existing subject syllabuses and teaching materials to include research elements in the teaching and learning process and to assist students in solving design problems facing in textile and fashion design by employing digital technologies. The study was separated into numerous phases to better integrate the research elements in students design study and measure the improvement effect effectively. The first step was to revamp the current subject syllabuses, teaching schedules, assessment criteria to provide students more time to learn about research methods and digital technologies. Secondly, the study intended to maximize tutorial time by allowing students to discuss and communicate research issues with the subject instructor. Through the tutorial sessions, the instructor can also better mentor students' research progress. Thirdly, the assignments and the assessment methods were tweaked to ensure that the study was of high quality. Finally, using an interactive education platform, the students' textile and fashion work and research outputs were guided to publish and promote to the public. This article documents and analyzes the whole process of the upgrading the subjects and evaluates the implementation and efficiency of practitioner-research in enhancing fashion and textile design teaching and learning through surveys. With the findings, we may realize how practitioner-research learning improves the learning experience of students, transforms the way the students learn, and brings them more creative in fashion and textile design.

2. Literature Review

2.1 Versatility Fashion and Textile Design Education

An interviewing of theoretical, technical and practical elements that make up a spectrum of artistic and business-focused manifestations of a phenomenon close to the center of the modern world constitutes fashion education at the university level (Svendsen, 2006). This complexity can lead to a reductionist approach to sustainability, focusing on specific problems in its parts that can be solved using cognitive skills of knowledge, but this approach often succeeds in

disabling students who are overwhelmed by the problem's (Fletcher and Williams, 2013). Fashion education for sustainability offers a opportunity to explore affective learning from a more constructivist perspective, piecing together how we may live well in the world, based on the unchangeable principles of what it is to be human. Many courses, however, still favor traditional lecture-based delivery of fixed knowledge, and many students are preoccupied with acquiring the correct answers to the problems, how to 'get it right' (Shephard, 2008).

Fashion entails the creation of meaning (identity and belonging) and materiality (materials and 3D contents) (Williams, 2016). Under this notion, the fashion and textile design education may be improved from two perspectives, a) the creation of new design concepts such as new culture, aesthetics, society issues; and b) the transformation of design processes including the use of digital technology. While the interventions of digital technologies, there are four kinds of digital technologies (i.e., laser engraving, digital printing, 3D printing and digital embroidery) that have been applied in the fashion industry and can be taught to students to help them to develop textile/fashion designs (Table 1).

Digital Technologies	Principles
Laser engraving	Textiles produced with laser engraving process, including the concepts of patterning and direct application in textile and garment design is studied in the subjects. Laser engraving and marking are versatile applications of the laser by using a parallel beam to remove the surface layer of fabric and transfer a pattern on its surface. When a high energy laser beam is focused and targeted on the fabric, the beam will heat the sample surface and ablate part of the material out.
Digital printing	Textiles can be created by using drawing, digital printing, and transfer printing processes for coloring and patterning. The computer-generated design can be printed on a transfer paper employing disperse-dyes inks by an ink-jet printer. A color image will efficiently be received from the transfer printing method with temperature and pressure by heat transfer machine on polyester fabric.
3D printing	3D printing is the process of creating 3-dimensional objects through joining or solidifying material under computerized control. A computer-aided design is converted into a 3D object by printing the material layer by layer and joining them in the form of a cohesive object. Synthetic materials like polylactic acid are available for 3D printing even they are not flexible and comfortable enough to be used as textiles or in garments. 3D printing in textiles is still at a conceptual stage, which has a large room for research and development.
Digital embroidery	Digital embroidery textile design is related to an embroidery process whereby a sewing machine or embroidery machine is used to create patterns on textile. Embroidery software contains significant improvements in the design and layout of the graphical user interface which offer productivity benefits.

Table 1. Digital Technologies and Their Principles

2.2 Engaging Undergraduates in Research through Practitioner-research

Some challenges in textile and fashion design education should be addressed to enhance students' learning experiences and improve their creative abilities on a holistic level. The first issue in current fashion and textile design education that needs be addressed is the lack of creativity and critical thinking (Tsai et al., 2013). The present textile and fashion design subjects emphasize teaching of textile or fashion techniques to assist students in developing textile or fashion design. Students are always focus on the production process machine/equipment operation (Zhang and Du, 2013). Furthermore, students may prefer to focus on designing textiles and fashion from the standpoint of generating an appealing aestheticlook, such as the color, pattern, rather than the concerns about the creating purpose and the changes that their creations may offer. Second, undergraduate design students had fewer opportunities to engage in research (Hathaway et al., 2002, Marti and Practice, 2008). Students have limited possibilities to engage in research and research-related activities due to the currentteaching approach of "teach to learn". Moreover, most students have little or no research experience and may be unsure about how to propose and carry out research. Third, because oftheir lack of creativity and critical thinking, students are less competitive in identifying and solving problems using appropriate techniques, which may jeopardize their long-term growth.

Course-based Research Experiences (Auchincloss et al., 2014) is a hypothesis that may be used to improve design students' research abilities and learning experiences at the undergraduate level. According to observations of course-based research in other disciplines especially in scientific research, the strategy has been found to boost the reach and impact of student research experiences (Bangera and Brownell, 2014). As a result, the subjects were designed using the theory of course-based research experiences and integrated with textile and fashion design practices. Students may gain skills in performing rigorous academic research as a result of their course-based research activities (Johnson et al., 2014). The research findings may be shared with classmates or subject instructors, with the goal of generating generalizable knowledge that others can benefit from. Practitioner-research is an emerging research that is fundamentally no different from other forms of research in that it is about generating new knowledge (Fox et al., 2007). According to Fox et al. (2007), a practitioner-researcher is someone who works in a professional capacity but is also expected to undertake research as part of their study. Practitioner research takes a unique approach to research and embeds research into practice. Students can also become practitioner-researcher by integrating research into their design process as a part of the notion. In the syllabus, evaluation method, and description, the course includes an objective that deals with the need for the students to acquire research abilities and is typically characterized as research. To mentor students' research development, evaluation criteria will be used to assess performance, which will include a quality assessment of the research. While the findings are instructional, they may be intended to reflect scholarly traditions and customary approaches in the discipline. Findings and results are rarely shared outside of the classroom or department, but they might be of high quality to be promoted through conference displays, seminar presentations, and articles.

3. Methodology

3.1 Participants

Undergraduate students ranging from Years 1 to 4 who enrolled in the fashion and textile design courses at The Hong Kong Polytechnic University, including Introduction of ThinkingStyle, Fashion Design, Creative Design Project, and Textile Design, completed the surveys to evaluate their learning experience. Survey 1 and survey 2 were completed by a total of 248 students and 161 respectively (Table 2). Students were informed about the project before and after implemented, and that research elements based on the concept of practitioner-research would be included to the teaching to enhance their learning experience. Subject instructors who teach the above-mentioned courses said that participation was voluntary and oversaw the consent process. The project was approved by the university's Educational Development Centre.

	Courses	Survey 1	Survey 2
A	Introduction of Thinking Style	52	54
B	Fashion Design	76	NA*
C	Creative Design Project	36	16
D	Textile Design	84	91
Total		248	161

Table 2: The demographics of students who participated in the courses and completed the surveys

(* When preparing this manuscript, the course just ended, and students did not complete the survey yet.)

3.2 Implementation Methods

To upgrade the subjects and enhance the learning experience, a theoretical framework of integrating practitioner-research in design education (Figure 1) was created. A preliminary study was conducted through the literature view and summarizing the previous teaching experience to investigate the issues that should be addressed in the current design education, such as weak creativity and critical thinking, less opportunity for design students to engage in research and weak competitiveness in the future developments. The concepts of research-led teaching and course-based research were applied in the project to add the research elements to develop courses by understanding the needs of learners, knowing what the students are interested in and what they will be able to perform. The courses focused on education from two perspectives: generic skills for personal development and professional practices should be taught in the courses, and design works should be integrated and completed in practices.

Hence, the intended learning outcomes were defined as: a) enhancing students' research abilities through design practices; b) facilitating students' educational experiences by adding research elements into teaching and learning activities; c) increasing the value of design outcomes by incorporating research methods throughout the design process, and d) providing students with more opportunities for further developments.

When the project was implemented in the courses, the subject syllabus and teaching materials were overhauled and modernized so that students could get theoretical knowledge in research and digital technologies first, then practice in practical designs subsequently. The concept of "practitioner-research" was integrated into teaching, and research methods applicable in practical designs such as finding design inspiration, idea test, experimental design, and result in the analysis were introduced to students so that they could solve design problems on their own. Meanwhile, students were given research directions such as design culture, circular design and human-centered design to help them construct design research projects and get insights into the design difficulties. Assignments and assessment methods have also been changed to encourage students to concentrate on the learning process and participate in research activities to provide competent design outcomes. The project's effects were designed to be evaluated in two ways, a) learning outcomes: subject instructor conducted a formative assessment and summative assessment to the ongoing work, research progress and final work and peer review conducted among the students based on their final work, and b) survey on learning experience: two surveys were conducted at the beginning and end of the class to find out the problems in students' design study and learning experience.

3.3 Evaluation and Survey

The project's impacts were evaluated based on the students' design outcomes that were reviewed by both subject instructor and peers, as described in the previous section. The subject instructor provided a formative assessment and followed up on the progress of students' design work and conducted. The summative assessment was based on the final work (e.g., individual or group design work), presentation and submitted portfolio/report. Communication, motivation, originality, and design diversity were among the primary criteria used to evaluate students' work. On the other hand, two surveys were conducted during the courses to know more about students' learning needs and learning experiences with the upgraded syllabus and integrate research elements in the design study. There are 5 questions in each questionnaire. The first survey asked about students' study needs, knowledge in research and awareness of design work promotion. The purpose of Survey 2 was to investigate the impacts of adding research elements into design courses and enhancing students' learning experiences.

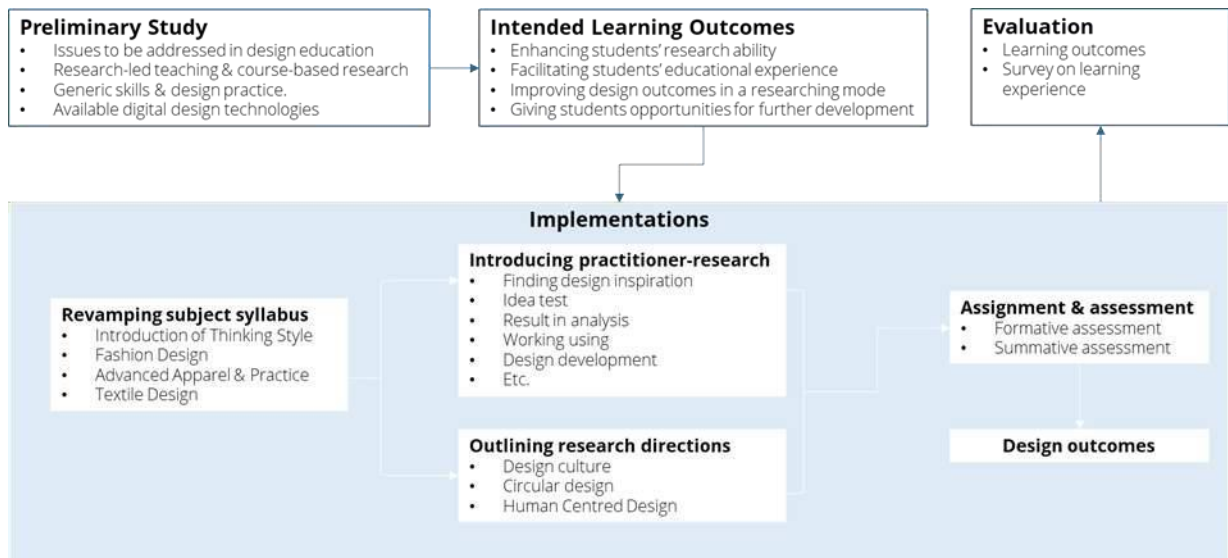


Figure 1. Implementation plan for integrating practitioner-research into undergraduate design education

4. Results and Discussion

According to the results from survey 1, approximately 70% of students believed they could solve the problem encountered throughout the design process using a variety of alternatives (Table 3). Less than 30% of students indicated they had previously participated in design research, while 34.7% said they may have a few opportunities to participate in a design research project and more than 37% claimed they had never participated in design research. When asked what research is and how to process it in a study, 37.5% of students replied they knew about research and could process it in the study, but the reminder revealed they only had a rudimentary understanding of how to process research in study or even did not know what research is. According to students' responses, nearly two thirds of students stated they used research in their design study.

Students attempted to develop a design research project and form practical design in their group-based design works after being introduced to research methods that were appropriate for design study, such as finding design inspiration, idea test, result from analysis or problem finding, facility use in lab or workshop, design development, design focus end-use, design interpretation, design promotion, and portfolio or report writing. Students created some practical designs based on the assignment criteria of several courses, which could be individual work, group work, report, or portfolio, using inspiration from the indicated study directions of design culture, circulate design, and human-centered design. In the case of Textile Design, students were taught numerous textile processes in addition to research methods in order to build a textile design that can be applied to home textiles, fashion design, accessories, and other areas. Within the course, students created a five-person group and used chemical etching and dyeing, as well as digital printing, to create group-based design work. Students should use the research methods they learned in different design stages, such as design idea development and sketching, presentation and confirmation, operation with textile technique, submission and

presentation, and taking a detailed record of the making process to prepare the portfolio and presentation later on. A virtual exhibition titled "Creative & Visibility - Towards Fashion and Home Textiles" was organized and released to assist students in promoting their design work and gaining experience presenting design work to the public (Figure 2).

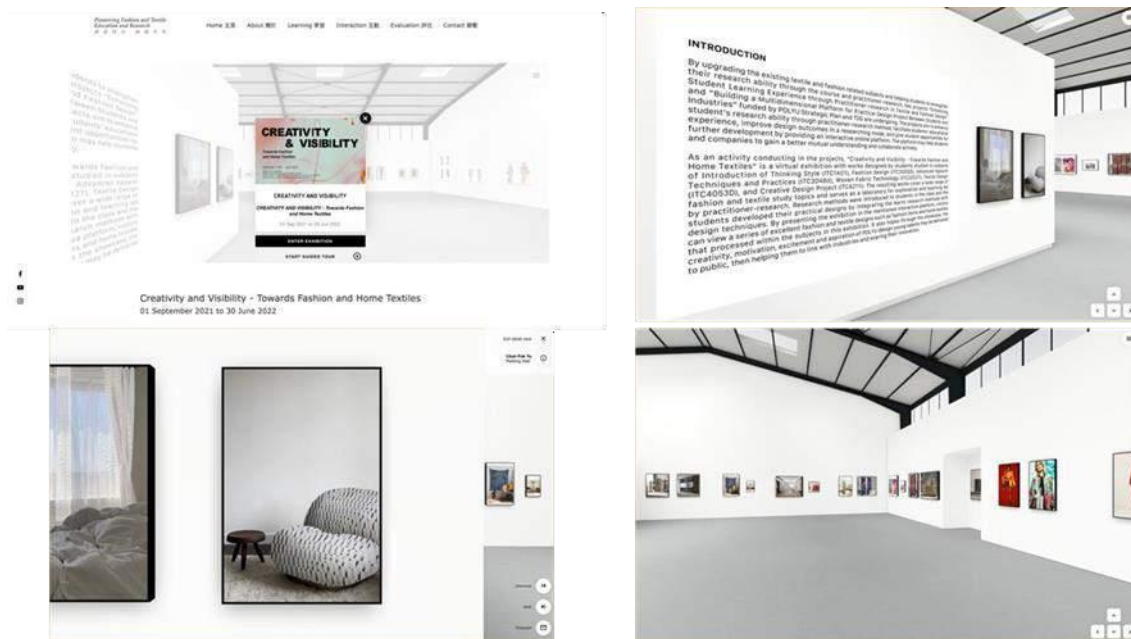


Figure 2. Virtual Exhibition: Creative & Visibility – Towards Fashion and Home Textiles
(Source: <https://qs1219397321.wixsite.com/edc-polyu/creativity-and-vsibility-exhibition>)

Through survey 2, the impacts of combining research aspects with the concept of practitioner-research in design courses on improving students' learning experiences were assessed. It demonstrated that students used the research methods they had learned to create experimental designs, individual design work, and group design work. Finding design inspiration (17.2 %), result analysis (13.7 %), and design development (13.6 %) are the top three research methods employed by students. Students were poor at promoting their designs (4.2 %) and had fewer thoughts for the end-use (7.6 %) application of their design efforts, according to the research. It also demonstrated that the overwhelming majority of students thought the knowledge learnt in the course helped them solve the problem (98.8 %) and would like to use it in future design research and study (99.4 %). For the format to present student's design, either online exhibition or offline exhibition are preferred format for students to present their work, and competition is another option for them to present their design talents. After the study, there was also a declining trend that some students who had no idea about how to promote their design outcomes transferred to have conscious or interest to do the promotion.

	Questions	Choices	Frequency (N)	Valid Percentage (%)
Survey 1	Q1: Do you think you could solve the design project's problem on your own?	Can	172	69.4
		Can't	76	30.6
	Q2: Have you ever had the chance to participate in a design research project?	Yes	70	28.2
		Few	86	34.7
		Never	92	37.1
	Q3: Do you understand what research is and how to use it in your research?	I know	93	37.5
		Know little	130	52.4
		Don't know	25	10.1
	Q4: Did you conduct any research as part of your design study?	Often	165	66.5
		Never	83	33.5
	Q5: Which of the following ideas do you think will help you promote your design outcomes? (Multiple choices)	Online exhibition	119	32.1
		Offline exhibition	120	32.3
		Competition	74	19.9
		No idea	58	15.6
Survey 2	Q1: During the class time, which of the following learning activities you employed research methods? (Multiple choices)	Experimental (samples)	105	27.8
		Individual design	144	38.1
		Group work	129	34.1
	Q2: Which of the following research approaches did you use in your design study? (Multiple choices)	Finding design inspiration	134	17.2
		Idea test	100	12.8
		Result analysis / Problem finding	107	13.7
		Facility use in lab / workshop	78	10.0
		Design development	106	13.6
		Design focus end-use	59	7.6
		Design interpretation	68	8.7
		Design promotion (e.g., Facebook / Instagram / YouTube / TikTok)	33	4.2

		Portfolio / Report writing	94	12.1
	Q3: Did the knowledge you gained in the subject assist you in solving a difficulty you might encounter in a future design project?	Yes	159	98.8
		No	2	1.2
	Q4: Would you like to apply the technique/process you learned in this class to a future design project?	Yes	160	99.4
		No	1	0.6
	Q5: Which of the following notions do you want to promote to promote your design outcomes? (Multiple choices)	Online exhibition	100	39.7%
		Offline exhibition	91	36.1%
		Competition	54	21.4%
		No idea	7	2.8%

Table 3. Statistics of the students who participated in the courses and completed the surveys

5. Conclusion

This study used course-based research theory and the concept of practitioner research to include research elements into fashion and textile design courses in order to improve undergraduates' design and research abilities. Four fashion and textile related courses were chosen as the experimental base to update the subject syllabus and encourage students to use research as a process for fashion and textile design development in order to integrate research elements into design courses. The students' research level was studied in the study through a survey conducted at the outset of the course to determine their learning needs and abilities.

According to the survey results, the majority of students had prior design experience and would like to tackle problems on their own. Following the previous literature review study, most students had insufficient awareness of research and did not have enough opportunity to participate in research activities. Furthermore, few students were aware of how to promote their design work, possibly because they were unsure of how to do so properly or because they lacked a suitable platform to present their work. To finish the courses, students were introduced to research methods and encouraged to construct design research projects in groups. A virtual exhibition was created to promote a variety of textile and fashion design works. Students sought to utilize research methods in the design development process to reflect their design thinking and raise design value to have more cultural aspects or meet marketing demands, according to the results of a survey that attempts to evaluate student learning experience after the course. More importantly, students were willing to apply research methods to future design

development, which would be more beneficial to their overall development. The study shows that practitioner-research can be a good strategy to include research elements into fashion and textile design instruction at the undergraduate level and can help students learn more effectively.

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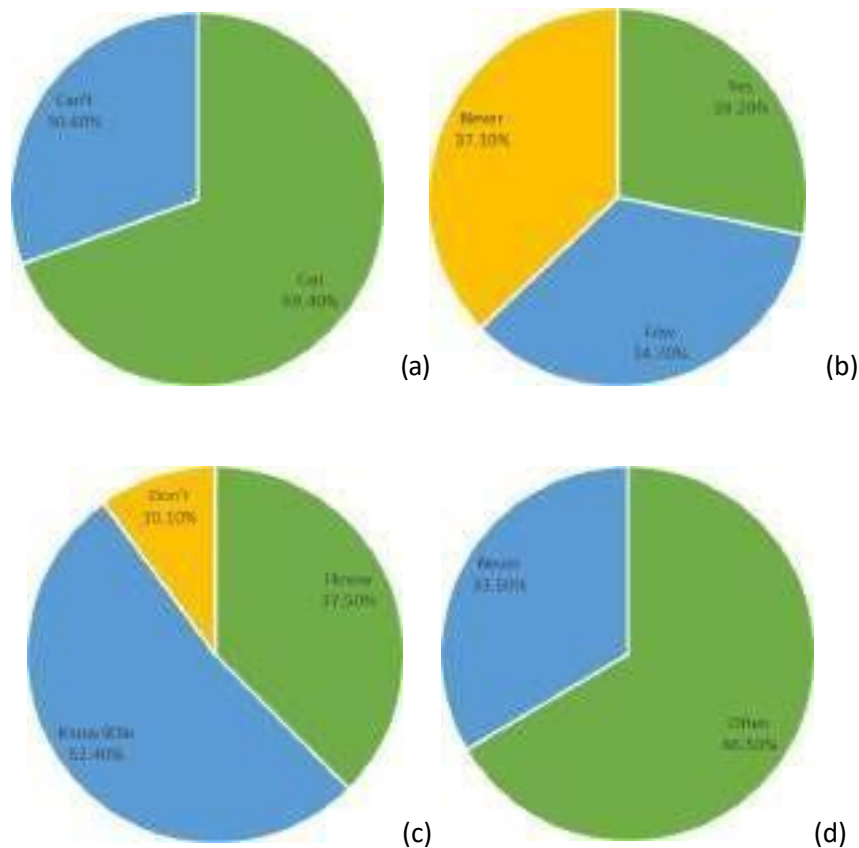
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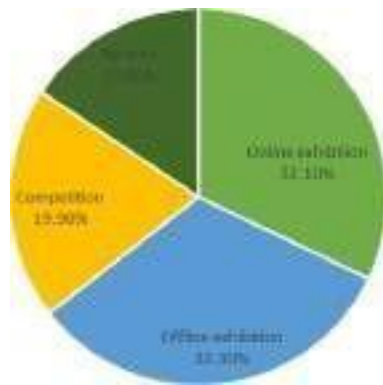
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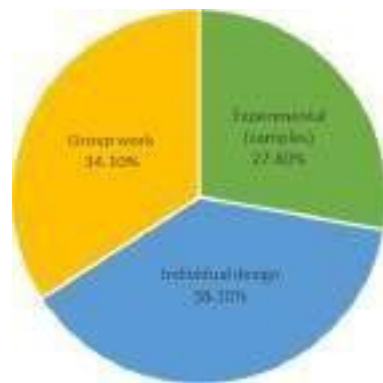
Appendices



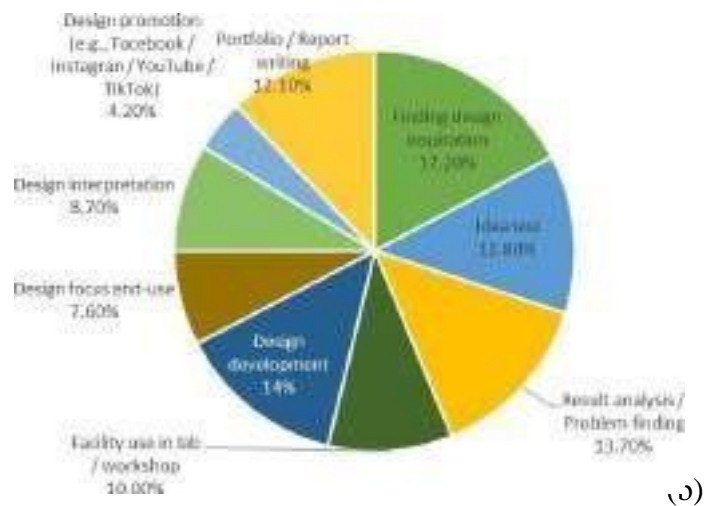


(e)

Figure 3. Statistics of survey 1, (a) Q1, (b) Q2, (c) Q3, (d) Q4, and (e) Q5



(a)



(b)

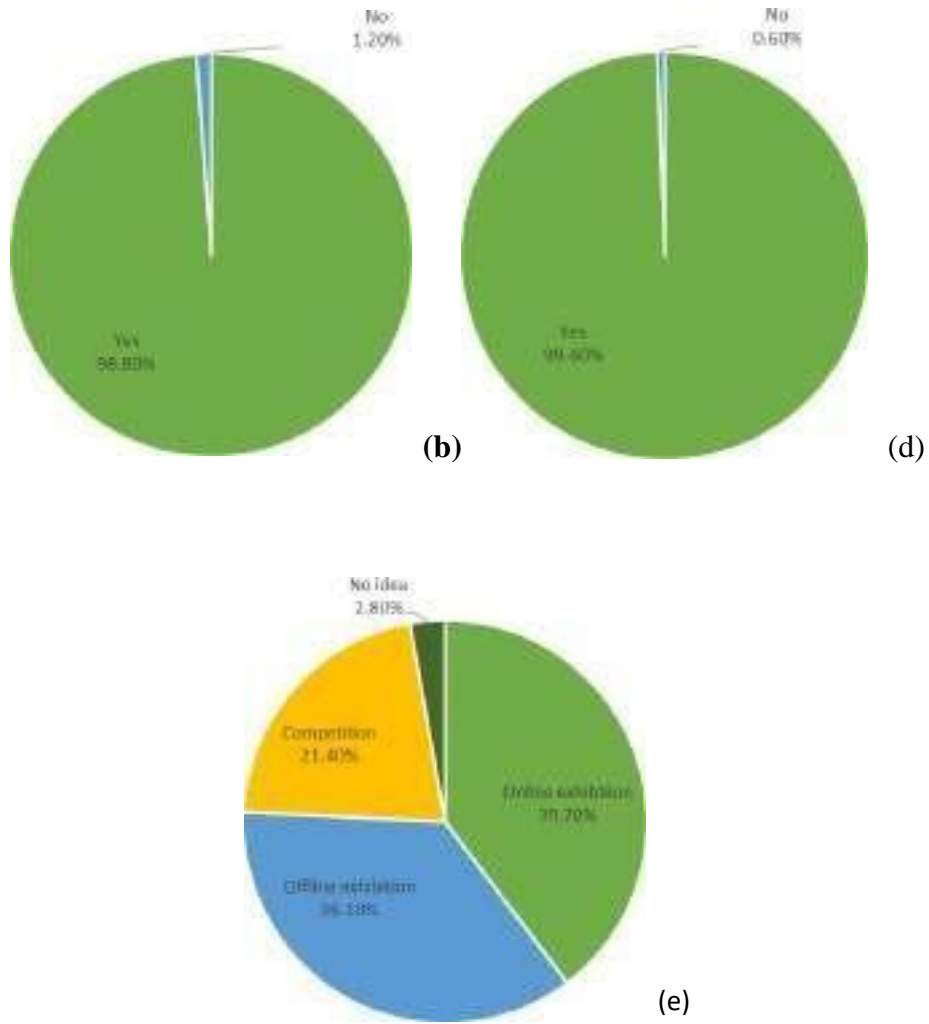


Figure 4. Statistics of survey 1, (a) Q1, (b) Q2, (c) Q3, (d) Q4, and (e)Q5