Exploring Student Awareness and Perceptions of Design Thinking in Higher Education

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Abstract

This study examined the awareness and perceptions of 37 Chinese students enrolled in an international business programme at a Thai university regarding design thinking. A quantitative approach was used, and data were collected through a self-administered questionnaire with 15 items on a 5-point Likert scale. The questionnaire assessed students' familiarity with the core principles of design thinking, including creativity, problem-solving, and user-centred design. Descriptive statistics were employed to analyse the results, providing an understanding of the students' knowledge and its relevance to their academic and future professional development. The findings revealed strong general awareness of design thinking, with most students recognising its emphasis on empathy, collaboration, and problem-solving, as well as its applicability across disciplines. A large proportion of students expressed interest in further learning about design thinking, indicating a positive outlook on its inclusion in their education and future careers. This research offers valuable information on student perceptions of design thinking and suggests areas for improving its teaching in academic settings.

Introduction

Design thinking is an approach to problem-solving that emphasises a human-centred methodology, encouraging creativity and collaboration to develop effective solutions. The process involves understanding user needs, generating potential solutions, and testing prototypes to refine ideas. According to Han (January 2022), Harvard Business School Online defines design thinking as a mindset that combines empathy with practicality, enabling businesses to create solutions that satisfy both user and business needs. The process aims to overcome traditional problem-solving limitations, encouraging teams to iterate and adapt based on user feedback. As a result, design thinking has become recognised across industries for its ability to drive innovation.

Liedtka (October 2018) argues that design thinking helps overcome biases and behaviours that may hinder innovation. The author suggests that focusing on the user and addressing their needs and challenges leads to more original and meaningful solutions. This approach also helps balance efficiency with creativity, encouraging businesses to embrace ambiguity and iteration. Liedtka asserts that integrating diverse perspectives and using user-driven feedback are important for discovering innovative solutions, making design thinking an important tool for modern businesses.

The practical benefits of design thinking include improved efficiency, reduced risks, and increased customer satisfaction. RMIT University (September 2022) explains that design thinking encourages businesses to reconsider their approach to product development, ensuring user needs are prioritised. This focus results in improved market readiness, reduced development costs, and a better return on investment. Real-world examples from companies such as IBM, IDEO, and Dyson demonstrate how design thinking has helped businesses innovate more effectively, leading to greater customer loyalty and better market performance.

One reason for the success of design thinking is its flexibility in addressing a wide range of issues. Han (February 2022) notes that the process consists of several stages: clarifying the problem, generating solutions, developing prototypes, and implementing the final solution. Each stage promotes a deep understanding of the problem and its context, followed by creative and iterative testing. Whether in a tech startup or a large corporation, revisiting earlier stages based on new findings ensures that solutions are practical and meet user expectations. In the end, design thinking enhances innovation and supports a culture of continuous improvement within organisations.

The significance of this research lies in its potential to address a gap in the existing literature on design thinking, particularly concerning student awareness and understanding of this approach. Although design thinking is becoming increasingly popular in various fields, including education, there is a lack of empirical studies exploring how students perceive and engage with design thinking as a problem-solving method. As design thinking is more widely integrated into curricula across educational levels, it is important to assess how familiar students are with its principles and practices. This research aims to evaluate student awareness of design thinking, focusing on how much students know about the process, how they view its relevance, and whether they recognise its potential to enhance skills such as creativity, critical thinking, and collaboration.

This study will contribute to understanding the effectiveness of implementing design thinking in educational settings. It will provide educators and curriculum developers with a clearer picture of whether design thinking is reaching students as intended and if students are prepared to apply it effectively in real-world situations. Furthermore, this research may inform future educational strategies and initiatives aimed at improving student understanding of design thinking, ensuring that students are better equipped to address complex, interdisciplinary problems. The findings may also reveal areas where additional resources, training, or curricular adjustments are needed to improve student awareness and engagement with this approach to problem-solving. Given the limited research on this topic, this study will contribute to the field of educational innovation and provide a foundation for further exploration into how design thinking can be better integrated into student learning experiences.

Literature Review

Design thinking has become a recognised approach to problem-solving and innovation in various fields, including education. In education, it is increasingly regarded as a tool to improve creativity, critical thinking, and collaboration among students, preparing them for the demands of the 21st century. A study by Retna (2019) explored teachers' experiences with design thinking in Singaporean schools. Teachers acknowledged its potential to enhance skills such as creativity, problem-solving, communication, and teamwork. The study also indicated that design thinking could help students develop empathy for others. However, it pointed out obstacles, including time constraints, limited resources, and

difficulties in moving away from traditional teaching methods. The research suggests that a structured approach to integrating design thinking into the curriculum is necessary, as partial implementation may not yield the desired results.

In higher education, especially in graduate-level library science programmes, there is growing interest in including design thinking in curricula. Clarke and Bell (2021) studied the attitudes of library and information science (LIS) programme directors towards incorporating design thinking into their programmes. Their research showed increasing openness to design education, particularly as a means to diversify curricula and meet the competencies demanded by employers in areas like user experience and public programming. However, the study also identified obstacles, such as bureaucratic issues and differing views on design education within the LIS community. These findings suggest that, although design thinking has the potential to reshape LIS curricula, more work is needed to clarify its role and integrate it effectively into graduate programmes.

Design thinking is gaining traction not only among educators but also among students. A study by Çiftçi and Topçu (2020) examined the experiences of 7th-grade students with design thinking, particularly in the context of energy transformations in the science curriculum. The study found that students valued the learning experience provided by design thinking, but faced difficulties in applying its various stages. An analysis of student diaries revealed themes of learning, satisfaction, and criticism, with students expressing interest in engaging in more design thinking activities in the future. These findings suggest that design thinking can create engaging and reflective learning environments, but students encounter difficulties in understanding and navigating the process.

Although design thinking is increasingly used across disciplines, its exact nature remains unclear. Bouwman et al. (2019) explored the different perceptions of design thinking through interviews with experts from academia and industry. The study revealed a division between those who view design thinking as a set of tools for problem-solving and those who consider it a broader mindset that influences how designers think and act. Experts agreed that design thinking can support innovation, particularly in business settings, when guided by trained designers. However, concerns were raised that the term "design thinking" could become diluted if marketed solely as a universal problem-solving tool. This critique suggests the need for a more nuanced understanding of design thinking to ensure its effectiveness and avoid misapplication.

The literature on design thinking in education suggests its potential to improve learning outcomes, stimulate creativity, and address real-world problems. However, the successful integration of design thinking into curricula, whether in primary, secondary, or graduate education, requires careful planning, adequate resources, and a clear understanding of its goals and methods. The studies reviewed indicate both the potential and the obstacles of adopting design thinking in education. They suggest that, although design thinking can be transformative, its implementation must be managed with care to avoid difficulties.

Methodology

This study explored the awareness and perceptions of 37 Chinese students enrolled in an international business program at a Thai university regarding design thinking. A quantitative approach was used, and data was collected via a self-administered questionnaire consisting of 15 items based on a 5-point Likert scale. The questionnaire was rated as reliable for data collection (Cronbach's Alpha=.88) The questionnaire assessed students' familiarity with design thinking principles, such as creativity, problem-solving, and user-centered design.

Participants rated their level of agreement with each statement, offering insight into their understanding of the concept and its potential relevance to their academic and future professional experiences.

Descriptive statistics were employed to analyze the questionnaire responses. The analysis provided a clear picture of the students' general awareness and perceptions of design thinking. The results were presented in a manner that highlighted key trends and patterns in students' responses, allowing for a better understanding of their familiarity with the concept. This research contributed to the limited literature on student awareness of design thinking, providing valuable insights for educators and curriculum developers interested in integrating design thinking into educational settings.

Results and Discussion

The questionnaire gathered students' awareness and knowledge of Design Thinking using a 5-point Likert scale. The responses are categorized into four main areas: familiarity with Design Thinking, understanding its components, perception of its applicability, and confidence in applying the methodology.

Familiarity with Design Thinking:
The majority (43.2%) of students strongly agree that they are familiar with Design Thinking, while 32.4% agree, indicating a general awareness of the concept. A smaller portion (2.7%) strongly disagrees, and a larger portion (21.6%) remains neutral.

Focus on Complex Problems:
51.4% of students strongly agree that Design Thinking is primarily focused on solving complex problems, and 37.8% agree. This suggests that students recognize the problem-solving nature of Design Thinking, with minimal disagreement (10.8%).

Empathy as a Key Component:
A significant 73% strongly agree that empathy is a crucial part of the Design Thinking process, while 24.3% agree. Only a small portion (2.7%) remain neutral, showing strong awareness of the role of empathy.

Collaboration Among Team Members:
An overwhelming 86.5% strongly agree that Design Thinking encourages collaboration, with 13.5% agreeing. This highlights the value students place on teamwork in the Design Thinking process.

Applicability Across Various Fields:
The vast majority (81.1%) strongly agree that Design Thinking applies beyond design, with 10.8% agreeing. This shows a broad recognition of its versatility across different disciplines.

Awareness of the Stages of Design Thinking:
73% strongly agree and 24.3% agree that Design Thinking involves multiple stages such as empathy, ideation, and prototyping. Only a small percentage (2.7%) are neutral, suggesting strong awareness of the methodology's structure.

Importance of User Feedback:
67.6% strongly agree that user feedback is essential in Design Thinking, and 16.2% agree, with a small portion (13.5%) being neutral or disagreeing. This shows a general understanding of the iterative nature of Design Thinking.

Previous Exposure to Design Thinking:
A majority (62.2%) have learned about Design Thinking in their studies, while 18.9% agree and 18.9% either disagree or are neutral, indicating that Design Thinking is well integrated into academic programs.

Creative Solutions for Real-World Problems:

70.3% strongly agree that Design Thinking helps generate creative solutions to real-world problems, with 27% agreeing. This supports the idea that students value the practical application of Design Thinking.

Enhancement of Problem-Solving Skills:

75.7% strongly agree, and 24.3% agree that Design Thinking enhances problem-solving skills, suggesting confidence in its impact on skill development.

Prototyping as an Important Element:

64.9% strongly agree, and 27% agree that prototyping is essential in Design Thinking, reflecting solid awareness of this critical stage in the process.

Usefulness for Personal and Professional Challenges:

A strong 73% strongly agree, and 21.6% agree that Design Thinking is applicable for both personal and professional challenges, highlighting its perceived universal value.

Real-World Application Experience:

51.4% have applied Design Thinking in real-world projects or tasks, and 32.4% have some exposure, showing that many students have hands-on experience with the methodology.

Confidence in Applying Design Thinking:

62.2% feel confident applying Design Thinking in various areas, and 35.1% agree, suggesting high levels of confidence among students in utilizing the methodology.

Interest in Future Learning:

86.5% express strong interest in learning more about Design Thinking, with 10.8% agreeing. This indicates a keen interest in deepening knowledge about the process.

The results from the questionnaire provide a comprehensive overview of student awareness and knowledge of design thinking, detailing various aspects of understanding and confidence. One of the most notable findings is the widespread familiarity with the core concepts of design thinking. The majority of students (43.2%) strongly agree that they are familiar with design thinking, with an additional 32.4% agreeing. This suggests that a substantial proportion of students are at least somewhat acquainted with the concept. However, the 21.6% who are neutral, along with the small percentage (2.7%) who strongly disagree, indicates that a notable portion of students may not have a clear understanding of what design thinking entails. This gap offers an opportunity for educators to address foundational concepts more thoroughly. For those less familiar, targeted lessons or introductory workshops could help increase awareness and provide a baseline understanding.

Another key aspect of the survey is students' recognition of design thinking as a methodology for solving complex problems. With 51.4% of respondents strongly agreeing and 37.8% agreeing, it is evident that most students understand design thinking as a tool for addressing difficult issues requiring creative, iterative solutions. This aligns with the broader purpose of design thinking in facilitating problem-solving across various domains. However, the relatively small percentage of students (10.8%) who disagree may indicate a misunderstanding of the scope of design thinking, suggesting that some perceive it as applicable only to specific types of problems or fields. Further clarification on how design thinking can be applied across a broad range of issues could help expand its perceived versatility.

Empathy and collaboration, central principles of design thinking, are also widely recognised by students. A significant 73% strongly agree that empathy is a key component of the process, with 24.3% agreeing, leaving only a small minority who are neutral. This suggests that most students grasp the importance of understanding users' needs and emotions

to develop effective solutions. Similarly, 86.5% strongly agree that design thinking fosters collaboration among team members, reinforcing the idea that design thinking is a collective, multidisciplinary endeavour. This widespread recognition of empathy and collaboration is promising, as it suggests that students value these principles, which are crucial for the success of the design thinking process. However, further exploration is needed to determine whether students fully understand how empathy and collaboration are enacted in real-world contexts, as these elements can be difficult to implement effectively.

The question of design thinking's applicability across various fields, not just design, is another area where students demonstrate a clear understanding. A significant 81.1% strongly agree with this statement, and only a small percentage remain neutral or disagree. This indicates an appreciation for the methodology's broad relevance beyond traditional design disciplines. The interdisciplinary nature of design thinking is one of its greatest strengths, allowing it to be applied in fields such as business, healthcare, education, and engineering. Given that students recognise this versatility, it may be beneficial to emphasise cross-disciplinary applications in curricula, helping students to see the potential of design thinking in their own fields of study.

Regarding the stages of design thinking—empathy, ideation, prototyping, and testing—students show a strong understanding. A total of 73% strongly agree, and 24.3% agree that they are aware of the multiple stages involved. This is a positive result, suggesting that students have a clear grasp of the structure of the process. However, further exploration of each stage, particularly through practical exercises, could help solidify this understanding and ensure that students can apply these stages effectively in real-world scenarios.

Another notable finding is the strong recognition of the importance of user feedback in the design thinking process. A total of 67.6% of students strongly agree, and 16.2% agree, indicating that students understand the iterative, feedback-driven nature of design thinking. However, the 13.5% who are neutral might not fully appreciate how crucial user feedback is in refining solutions, suggesting that additional emphasis on the feedback loop would be beneficial. Workshops or case studies focusing specifically on how user feedback drives innovation could deepen this understanding.

The data also indicates that many students have learned about design thinking in their studies, with 62.2% strongly agreeing and 18.9% agreeing. This suggests that design thinking is being incorporated into academic curricula, although a small portion (18.9%) have either not encountered it or may not recall it as part of their coursework. For those less exposed to the methodology, additional course offerings or co-curricular activities could help increase exposure and understanding.

The survey shows that students strongly believe in the ability of design thinking to generate creative solutions for real-world problems, with 70.3% strongly agreeing and 27% agreeing. This is encouraging, as it demonstrates that students recognise design thinking as a tool for innovation and practical problem-solving. Similarly, 75.7% strongly agree that design thinking can enhance their problem-solving skills, indicating confidence in the methodology's ability to improve analytical and creative thinking. This is significant, as it suggests that students see design thinking as a way to develop transferable skills applicable in both personal and professional contexts.

The recognition of prototyping as an important part of design thinking is also noteworthy, with 64.9% strongly agreeing and 27% agreeing. Prototyping is central to the iterative nature of design thinking, and students seem to understand this well. However, further exploration of different prototyping techniques, particularly through hands-on projects, could help students feel more confident in creating prototypes and using them to refine their solutions.

Students' confidence in applying design thinking to personal and professional challenges is another positive finding, with 62.2% strongly agreeing and 35.1% agreeing. This suggests

that many students feel equipped to use design thinking in various contexts, although it may be useful to assess whether this confidence translates into real-world application. Opportunities for students to engage in projects outside of the classroom, such as internships or collaborations with industry partners, could help bridge the gap between theory and practice.

Finally, the strong interest in learning more about design thinking, with 86.5% of students strongly agreeing and 10.8% agreeing, indicates a desire to deepen their understanding of the methodology. This presents an opportunity for institutions to offer advanced workshops, certification programmes, or specialised courses to nurture this interest and develop students' expertise.

The results show a high level of awareness, understanding, and interest in design thinking among students. However, there are areas that require further attention. Providing more practical experiences, focused lessons on specific stages, and opportunities for real-world application would help students realise the potential of design thinking as a tool for innovation and problem-solving. Additionally, ensuring that all students are exposed to the methodology, especially those less familiar, would help create a deeper and more consistent understanding across disciplines.

The studies reviewed provide perspectives on the adoption and impact of design thinking in education, revealing both its benefits and limitations. Retna (2019) found that, although design thinking can improve skills such as creativity, problem-solving, and communication, its implementation in Singaporean schools faced obstacles like limited resources and difficulties in moving away from traditional teaching methods. These findings stress the importance of providing adequate support and structure when integrating design thinking into curricula. Educators must consider these issues to avoid a fragmented approach that may undermine the effectiveness of design thinking in achieving desired outcomes.

Similarly, Clarke and Bell (2021) explored the integration of design thinking into graduate-level library science programmes, noting a growing openness to the approach but also significant obstacles. These included bureaucratic issues and differing definitions of design education, making integration difficult. Their study suggests that, although design thinking has the potential to diversify curricula and align graduate competencies with industry needs, further clarification and agreement are needed within educational institutions. This reveals the complexity of embedding design thinking into higher education, particularly in fields with deeply rooted traditional methods.

Çiftçi and Topçu (2020) examined 7th-grade students' experiences with design thinking in science curriculum activities. The study found that, although students appreciated the learning experience, they faced difficulties with the process stages, suggesting a gap between theoretical understanding and practical application. This finding aligns with Bouwman et al. (2019), who noted differing views of design thinking, with some seeing it as a set of tools and others as a mindset. Both studies stress the need for structured environments that allow students to practise and refine their understanding of design thinking. To maximise its impact, educators must not only introduce concepts but also provide students with the skills and opportunities to engage meaningfully. It is also important to avoid reducing design thinking to a simple problem-solving tool, as this limits its potential for encouraging innovation.

Conclusion and Suggestions

The findings from this study suggest that students enrolled in an international business programme at a Thai university generally possess a strong awareness and understanding of

design thinking. Most students recognise the methodology's focus on solving complex problems, its emphasis on empathy, and its promotion of collaboration, which are central elements of the process. The results also indicate the broad applicability of design thinking beyond the design field, with students recognising its potential across various disciplines and professional contexts.

Additionally, the majority of students demonstrated confidence in applying design thinking to solve problems and expressed a strong interest in learning more about the methodology in the future. This suggests that students see its practical utility and are keen to further develop their skills in this area. However, a small proportion of students remain neutral or less familiar with the core components of design thinking, indicating a need for more targeted exposure to the methodology, particularly for those with less prior knowledge.

Overall, the study highlights the importance of integrating design thinking into academic curricula, particularly in interdisciplinary settings such as business programmes, where the ability to apply innovative problem-solving techniques is highly valued. The findings also suggest that educators and curriculum developers should consider incorporating more hands-on experiences and real-world applications of design thinking to bridge the gap between theoretical knowledge and practical application. As interest in design thinking continues to grow, further research could explore the impact of different teaching approaches on students' mastery and application of the methodology.

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