

Original article

A Review of Literature of Design Thinking in Health Education

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Abstract

Background: The 21st Century skills are crucial for nursing and other health education regarding critical thinking, creativity, collaboration and communication. To develop these skills, design thinking (DT) framework could be an effective tool. Although it has been introduced to health education for decades, evidence of its application in Thai health care education is still limited. This article aimed to identify the use and effectiveness of design thinking concept in health care education and discuss further implication. **Method:** Search terms, namely, “design thinking” and “health education” were used to search in CINAHL, a journal indexing tool of research literature from nursing and other allied health professions, and Google Scholar. Hand search was used to seek for relevant papers from reference lists. Inclusion and exclusion criteria were applied for paper selection. **Results:** The five articles met inclusion criteria. One is the qualitative review applying scoping review method to review the design thinking framework in health professional education. Three article was a primary research which conducted in interdisciplinary context. One is a research article which discusses about three case study research. All five studies recognized DT as an effective tool for improving quality of health care education, however DT course design should be well designed which should be suitable for student characters. **Conclusion:** Design thinking could benefit both health education and health professions education staff. For health education, design thinking could be used to improve critical thinking skill, however precise DT course design and student centered approach is key. DT combining with other frameworks (e.g. system thinking) could be useful for minimizing unintended consequences.

Key words: Design thinking, Health care education, Review article

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Introduction

1. What is design thinking?

Design thinking (DT) concept is recognized as a creative and human centered process for designing a product or service to suitable for a custom user (Habash, 2017; Liedtka, 2018; Plattner, 2018). There are several concepts around DT concepts. For example, Hasso Plattner Institute of Design at Stanford (Stanford d.school) design thinking process comprises of five steps, namely, “empathize”, “define”, “ideate”, “prototype” and “test” (Plattner, 2018; Habash, 2017). Firstly, a service user needs to be empathized, therefore making sense of his or her need, thinking and behavior is key (The Interaction Design Foundation, 2020). Secondly, defining the problem by focusing on analyzing and synthesizing a service user’s problems. Thus, the second stage should be flexible and service user centered (The Interaction Design

Foundation, 2020). Thirdly, ideation is creating ideas for solving the client’s problem. This could link with the next step; prototyping. Prototyping requires a good cycle of create and re- create a protocol or solution for problem solving. The last step is testing the protocol which will be used to prove whether the solution is working. Although, DT contains the certain five steps of working, it is not a linear process (The Interaction Design Foundation, 2020). Lande (2010) indicates the epistemological view of DT as human centered approach, empathy and mindful of process, prototyping and collaboration, however there are two points of views adding to DT concepts which are “show don’t tell” (adding digital communication and storytelling) and “bias towards action” (working on action based instead of discussion based practice).

2. Why DT is important for health education?

DT is recognized as an effective concept to improve innovation or problem solving which ensuring efficiency, and effectiveness with regards to working based on both service user’s and service provider’s needs (Altman, M., Huang, T. T., & Breland, J. Y. 2018; Badwan et al., 2018). DT is not only improving client centered and holistic consideration for patient care, but also this should influence student personal development. For example, developing an innovation for fall prevention requires service user feedback in order to improve a

customized and holistic innovation for an older person which could be more practical and sustainable. This concept could be fitted with both health education and health care service contexts. DT could be used to improve the 21st century education skills regarding soft skills, such as, critical thinking, creativity, collaboration and communication. These skills could influence learners to reach the national Desired Outcomes of Education (DOE), for example, Thai DOE is focusing on learner person, innovative co-creator and active citizen (Office of the Education Council, 2018).

Research Methodology

Objectives

To identify the use and effectiveness of design thinking concept in health care education.

Study Design

Review of literature.

Method

A review of literature was carried out. Inclusion and exclusion criteria were applied for this review. Search terms were “design thinking in health education” which was limited in research title. All search terms,

inclusion and exclusion criteria were applied to both CINAHL and Google scholar. Moreover, reference lists were searched manually.

Inclusion criteria

1. Using design thinking framework as the main of the study or research question(s).
2. Using design thinking in health educational context.
3. Publication year 2010 – 2020.

4. Published in Thai or English language.
5. Full text are available online.
6. Published in an academic journal.

Exclusion criteria

1. commentary article
2. Pilot study

Results

Twenty eight papers were retrieved from CINAHL and three papers were retrieved from Google scholar. One paper was

found by reference list searching. However, there were five papers met inclusion criteria CINAHL (2) and Google scholar (3).

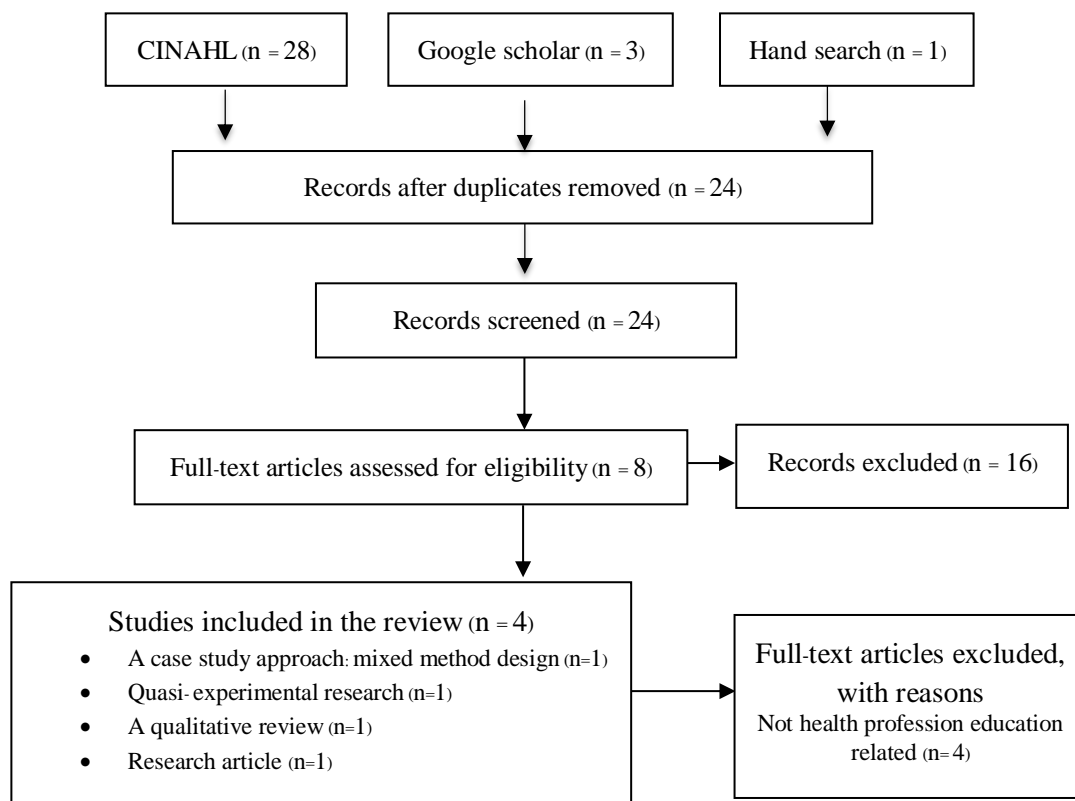


Fig.1 Article review flow diagram

Table 1 Overview of the five selected papers

Title and author	Objective and method	Result
1. Design thinking: an educational model towards creative confidence (Rauth et al., 2010).	- Concept analysis of DT - Qualitative interview regarding experts from USA and Germany (n=17)	<p>1. Concept analysis: basic concepts of DT comprises of:</p> <ol style="list-style-type: none"> 1) Human centered process 2) Mindful of process 3) Empathy 4) Culture of prototyping 5) Show don't tell mindset 6) Bias towards action <p>2. Qualitative interview:</p> <p>2.1 DT is a dynamic process which could create creative confidence</p> <p>2.2 Goals of DT education are:</p> <ol style="list-style-type: none"> 1) cognitive knowledge transfer 2) emotional and motivational abilities 3) competencies and skills learning 4) open category: students should be free to express their ideas regardless frameworks 5) changes in behaviors <p>2.3 Modes and process steps:</p> <ol style="list-style-type: none"> 1) the emphasize- mode: to improve better understanding of the problems and needs of clients, interview and observation should be taught in this phase. 2) the define- mode: vein diagram or two by two matrix are recommended. 3) the ideation- mode: brainstorming is recommended. 4) the prototyping- mode: physical sketching or computer simulation are recommended. 5) the test- mode: students should be able to evaluate their own works for further improvement.
2. Design thinking as a tool for interdisciplinary education in health care (Van de Grift and Kroeze, 2016)	<p>- Applying a case study approach: mixed method design</p> <p>- Using "Hacking Healthcare" which was a 15 weeks Intervention for multidisciplinary groups (n=24)</p> <p>- Applying three stages of DT framework:</p> <ol style="list-style-type: none"> 1) inspiration (8 weeks), 2) ideation (5 weeks) and 3) implementation (2 weeks) 	<ol style="list-style-type: none"> 1. Self-rated questionnaire: 8.5/10 which means that the participants satisfied with the "Hacking Healthcare" course 2. Interview data: positive perspectives towards the "Hacking Healthcare" course

Table 1 Overview of the five selected papers (Cont.)

Title and author	Objective and method	Result
3. The importance of design thinking in medical education (Badwan et al., 2018)	<ul style="list-style-type: none"> - Quasi-experimental research using game based learning - Working on curriculum development 	DT improves academic and clinical development as well as personal attributes regarding creative confidence, toleration of uncertainty and acceptance of iteratively innovative improvement
4. A qualitative review of the design thinking framework in health professions education (McLaughlin et al., 2019)	<ul style="list-style-type: none"> - Applying scoping review - Inclusion and exclusion criteria were applied for paper selection - Critically appraised 15 papers 	<ol style="list-style-type: none"> 1. Various styles of DT frameworks were found from selected studies 2. Almost all studies provided non-DT outcome measured 3. DT framework is useful for improving multidisciplinary collaboration and participation of stakeholders 4. DT framework is effective on human centered approach regarding problem and need identification
5. Re-thinking health through design: collaborations in research, education and practice (Rowe et al. 2020)	- To review relevant DT research	<ol style="list-style-type: none"> 1. The use and effectiveness of three case studies: 1) end of life care, 2) interdisciplinary health education and 3) community based health care. 2. The “model of collaborative clinical care” should be promoted

Discussion

1. The use of DT concept and its effectiveness in health care education

DT concept was applied for various research designs. DT was used in health care education both single and interdisciplinary education. Rauth et al. (2010) mentioned that basic concepts of DT should comprise of human centered process, mindful of process, empathy, culture of prototyping, and “show don’t tell” mindset. It could be claimed that DT could be used to create creative confidence for students (Rauth et al. 2010; Badwan et al. 2018) and collaboration between team members (Cahn et al. 2016; McLaughlin, 2019). Although DT process could improve learners to be critical, creative and aware of human centered approach, background of the students should be considered before applying DT framework.

Van de Grift and Kroeze (2016) applied a case study approach in DT as a tool for interdisciplinary education in health care research: “Hacking Healthcare” course. The study took fifteen weeks which were 1) inspiration phase (8 weeks), 2) ideation phase (5 weeks) and 3) implementation phase (2 weeks). Results of the study showed that DT could be an effective course for interdisciplinary group with regard to high self-rated rating score (8.5 out of 10) and Interview data was positive. However, course design and student characteristics required special consideration, for example, art students are probably prefer working independently compared to align health and social science students (Van de Grift and Kroeze, 2016).

McLaughlin (2019) conducted a scoping review of the design thinking framework in

health professions education. This study found that DT framework could be useful for improving multidisciplinary collaboration and participation of stakeholders. Although DT framework seemed effective on human

centered approach regarding problem and need identification, this study found that almost all studies provided non-DT outcome measured.

2. The implication of DT in health educator management

The two main points for further DT implication are course curriculum development and learner development.

2.1 Course curriculum development

Well-structured DT process is recommended for educational course. Van de Grift and Kroeze (2016) mentioned that DT course design should be planned clearly. The course should meet student needs which evidence showed that an elective course tended to be effective compared to compulsory. McLaughlin (2019) stated that DT framework should be applied to educational course regarding student centered as well as some courses that require human centered approach DT framework could be used to improve student critical thinking. It could be

2.2 Learner development

DT framework is dynamic which is similar to research and development. The DT process could improve learners to be critical, creative and aware of human centered approach. To apply DT framework, background of the students should be considered. For example, Rauth et al. (2010) suggested that students

considered that the careful curriculum should be flexible and able to influence health care students to reach the Thai Desired Outcomes of Education (DOE) which focusing on learner person, innovative co-creator and active citizen (Kettunen, J., Kairisto, Mertanen, L., & Penttilä, T., 2013; Office of the Education Council, 2018). Rowe et al. (2020) stated that course credits should be reconsidered with regarding to increase more interdisciplinary collaborations which was the “model of collaborative clinical care.

should be free to express their ideas regardless frameworks in order to influence learners to be creative and confident. Game based learning could be an example of clinical teaching based on DT concept which improves cognitive and personal attributes (Badwan et al., 2018).

Conclusion

In conclusion, DT concept was applied among health professional and education. DT could be an effective framework for critical thinking, creative

thinking and human centered approach. Furthermore, creative confidence could be developed after applying DT.

Suggestions for the further study

Empirical research of design thinking in the Thai health education context should be conducted.

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