Incorporation of Design Thinking into Medical Education: Potentials and Prospects

Toluwalashe Sogbenga Soyemi [1, *], Paul Jombo [2] and Akingbola adewunmi [1]

[1]Department of Medicine, Lagos State University College of Medicine, Lagos, Nigeria
[2]Department of Nursing, Lagos State University College of Medicine, Lagos, Nigeria

[*]*Corresponding author*: Department of Medicine, Lagos State University College of Medicine, Lagos, Nigeria. Email: sogbengasoyemi16@gmail.com

Dear editor,

Medical innovations and healthcare solutions have become more of rising growth in medicine and healthcare. The recent development of the Internet of Things has evolved connectivity and transformed communication and collaboration among healthcare professionals. Three-dimensional printing in healthcare has also increased productivity and reduced labor costs. However, remote patient monitoring and care have changed the perspective of how healthcare can be accessed. Therefore, technological advancements in medicine have provided innovative solutions to complex problems using an end-user approach by prototyping, testing, and being empathy-driven (1). Consequently, solving medical-centered problems requires a form of accessing problems and driving industrial innovations.

In addition, although the global community in medicine has made significant progress in the areas of creative design and problem-solving, much is still lagging in how aspiring physicians develop innovative healthcare solutions. This can be attributed to physicians not being exposed to design thinking tools and processes that would enable them to tackle challenging problems facing healthcare deliveries and services. A closer look suggests that the strong reliance on quantitative measures to analyze problems by clinicians and measurement of the effectiveness of solutions can be traced back to the evidence-based mindset of healthcare professionals (2). As a result, medical students and physicians are left out in areas of developing innovative solutions, and the resultant effect is physicians using traditional solutions to solve 21st-century problems in a world growing with industrialization and globalization.

Unarguably, for the development of more sustainable and scalable solutions in healthcare, there is a need for healthcare professionals and students to have more than the knowledge of basic understanding of creativity but adequate information of creating solutions. Larry Leifer, founding director of the Stanford Center for Design Research, inventor of design thinking, and often regarded as the father of design thinking, defined design thinking as a method for the development of innovative solutions to complex problems by deliberately incorporating the concerns, interests, and values of humans into the design process (3). This different model of design thinking emphasizes the importance of understanding the problem from the users' experiences and tailoring the design of the solution in that direction such that the potential users' needs, desires, and pain points from their alternative solution to the problem are catered for.

Another major highlight of this model is that it allows for progressive refinement of the ideas until the most appropriate and feasible solution is designed in a bid to solve a complex problem, all of which can be incorporated into developing healthcare innovations. This commentary elucidates the importance and application of design thinking in medical education as a tool of equipping medical students while encouraging medical educators to revamp the curriculum to include the subject matter. We highlighted parameters of design thinking, including its benefits, and current approaches to design thinking in the educational sector, and proffered workable recommendations to maximize the potentials of design thinking in medical education.

Although the topic of design is a growing one among development sectors, such as businesses, healthcare, and the workplace, there is still limited data regarding the direct application of design thinking in medical educa-

tion. However, there is a growing body of literature that highlights how healthcare professionals apply design processes in the clinical context. Design thinking has been defined as a creative and human-centered approach to problem-solving and has been known to improve clinical context by addressing healthcare spending, patient experiences, and clinical outcomes (4). Design thinking has also been shown to have a direct correlation with long-term innovation by encouraging methods of rapid prototyping, stimulating collaboration between diverse individuals, and creating a new approach to solving problems (5).

The values of healthcare and medicine, as a profession, are deeply rooted in empathy and humanism. Therefore, it is pertinent to incorporate the art of design into the medical curriculum to develop solutions relating to healthcare management and delivery (6). Michael Gottlieb et al. generalized the applications of design thinking in medical education (7). The first application is the development and implementation of specific products as observed in the foundation of a new medical school in Penn State University, the United States, and the development of a learner-centered education as a result of curriculum reform in Harvard Medical School, the United States. The second application is the acquisition of a new way of thinking, solving problems, and developing solutions. Recent evidence has also shown how design thinking can be a helpful tool even for inter-disciplinary education in healthcare and medicine. This study showed how healthcare professionals could effectively communicate and collaborate with other disciplines and develop different insights to solving problems (8).

Although the benefits of design thinking are continually being explored, another question can be envisaged on the possibility of incorporating design thinking into the medical curriculum. The question gears from "Should it be incorporated" to "How can it be incorporated into medical education in an effective way"? There are however, few studies on the subject. Recent studies have shown that although design thinking involves the creative ability of an individual, collaboration is a requirement in the design thinking process (9). Few studies that have shown the incorporation of design thinking into educational curriculum demonstrated how students collaborated to develop innovative solutions in both their universities and healthcare space (8, 10).

Students were generally grouped into teams during the training and developing solutions together. Furthermore, it should be noted that incorporating design thinking into the medical curriculum required the contribution of medical students, stakeholders (including academic teaching staff), and medical school administrators that should be involved in this additive process (4, 6). This is important to maintain overall participatory processes and respect the contribution and perspectives of each stakeholder group (4).

Another important factor that was highlighted in these sample discussions is the use of visualization tools in the design process and the use of experts to train the students. This is no surprise since sketching and drawing has immensely contributed to individuals' creativity by helping in the verification and modification of various thought representation (11).

According to Callahan, "the goals of medicine encompass the relief of pain and suffering, promotion of health and the prevention of disease, forestalling of death and the promotion of a peaceful death, and the cure of disease when possible and the care of those who cannot be cured." (12). Over the past century, medicine and medical educators have been focused on achieving these goals; nevertheless, the challenges in medicine are ever-changing, so should the approach to medical education. In a developing country, such as Nigeria, the demand for quality healthcare is on a steady rise even as it battles with the recent severe acute respiratory syndrome coronavirus 2 pandemic. Apart from many other challenges facing its health sector, one way to further improve healthcare is to advance the approach toward medical education that can help build more competent and pro-efficient healthcare professionals while also creating a more patient-centered approach.

The topic of design thinking in medical education is relatively new; therefore, subsuming design thinking under medical education might be complex. However, a way to mitigate this is through collaboration and contribution among major stakeholders, such as faculties, academic staff, and students. These can allow its simplification and promote the participation of every stakeholder. As medical education in developing countries continues to face numerous problems, ranging from inadequate funding, incoherent admission policy, and even an archaic curriculum, there should be an overall review of the medical curriculum that suggests the consideration of design thinking in medical education.

Footnotes

References

1. Abhyankar L M]. *Can design thinking improve health care for patients, physicians?* Aafp.org; 2019, [cited 6 Feb 2021]. Available from: https://www.aafp.org/news/blogs/freshperspectives/entry/20190205fp-designthinking.html.

2. Chenoweth H. *How design thinking is driving innovation in healthcare*. Healthspacesevent.com; 2018. Available from: https://info.healthspacesevent.com/blog/how-design-thinking-is-driving-innovation-in-healthcare.

3. Prefontaine C. *Design thinking, essential problem solving 101- it's more than scientific*. Interaction-design.org; 2017, [cited 6 Feb 2021]. Available from: https://www.interaction-design.org/literature/article/design-thinking-essential-problem-solving-101-it-s-more-than-scientific.

4. Sandars J, Goh PS. Design thinking in medical education: The key features and practical application. *J Med Educ Curric Dev*. 2020;7:2382120520926520. doi: 10.1177/2382120520926518. [PubMed: 32548307]. [PubMed Central: PMC7273544].

5. Altman M, Huang TTK, Breland JY. Design thinking in health care. *Prev Chronic Dis*. 2018;**15**. E117. doi: 10.5888/pcd15.180128. [PubMed: 30264690]. [PubMed Central: PMC6178900].

6. Guest. *Interactive video blog series: Design thinking in medical education: Creating a new school at Penn State University*. Harvardmacy.org; 2017, [cited 6 Feb 2021]. Available from: https://www.harvardmacy.org/index.php/hmi/design-thinking-medical-education.

7. Gottlieb M, Wagner E, Wagner A, Chan T. Applying design thinking principles to curricular development in medical education. *AEM Educ Train*. 2017;**1**(1):21–6. doi: 10.1002/aet2.10003. [PubMed: 30051004]. [PubMed Central: PMC6001598].

8. van de Grift TC, Kroeze R. Design thinking as a tool for interdisciplinary education in health care. *Acad Med*. 2016;**91**(9):1234–8. doi: 10.1097/ACM.0000000000001195. [PubMed: 27097052].

9. Brown T. *Design thinking*. Cham, Switzerland: Harvard Business Review; 2008.

10. Badwan B, Bothara R, Latijnhouwers M, Smithies A, Sandars J. The importance of design thinking in medical education. *Med Teach*. 2018;**40**(4):425–6. doi: 10.1080/0142159X.2017.1399203. [PubMed: 29125007].

11. Anderson E, Lilly B. Visualization in the design process: Introducing 2D and 3D sketching techniques to enhance creative thinking and communication. *The 7th International Conference on Engineering and Product Design Education*. Delft, the Netherlands. 2004.

12. Callahan D. Managed care and the goals of medicine. *J Am Geriatr Soc*. 1998;**46**(3):385–8. doi: 10.1111/j.1532-5415.1998.tb01060.x. [PubMed: 9514393].