

University Students' Competencies and Character Qualities Developed in Design Thinking

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Abstracts

“Design creativity” is now a popular trend to groom innovative people in problem solving. This study centered on the university students’ Social and Emotional Learning (SEL) towards Design Thinking approach to deliver a new or improved outcome (product or service). Questionnaires and feedback from students were employed to gather extensive data on students’ competencies and character qualities during the Design Thinking project. Key findings show that the university students are self-engaged in problem-solving activities based on real world scenarios. They appreciate communication and collaboration among group members and industrial experts. Design thinking harnesses students’ learning and real world experiences.

Keywords

Design Thinking, Innovation, Education, Social and Emotional Learning, Competencies, Character Qualities.

Introduction

In today’s highly technological and globally competitive world, a person is required to develop different set of skills than were needed before (Shute & Becker, 2010). Razzouk and Shute (2012) identified the features and characteristics of design thinking and its importance in promoting students’ problem-solving skills needed to succeed in the 21st century. Design thinking prepares students to be innovative and creative in delivering practical entrepreneurial skills for them to put ideas into action either in business or social well-being contexts. As it is still relatively new in Malaysian education, it can be challenging for the educators and students to be engaged in an entirely new approach to learning. Student learning experience in higher education is now transformative to self-learn and collaboration to solve the real world challenges.

Educational Landscape

The profile of the current learners has changed. The educational curricular and pedagogical approaches are important to compliment with the learning styles of this generation. In line with the World Economic Forum (2016), students need more than traditional academic learning to thrive in the 21st century. The Social and Emotional Learning (SEL) is important as the foundational skills required for traditional academic learning to prepare today's students for this evolving work space. "Coupled with mastery of traditional skills, social and emotional proficiency will equip students to succeed in the swiftly evolving digital economy" (World Economic Forum, 2016: 4).

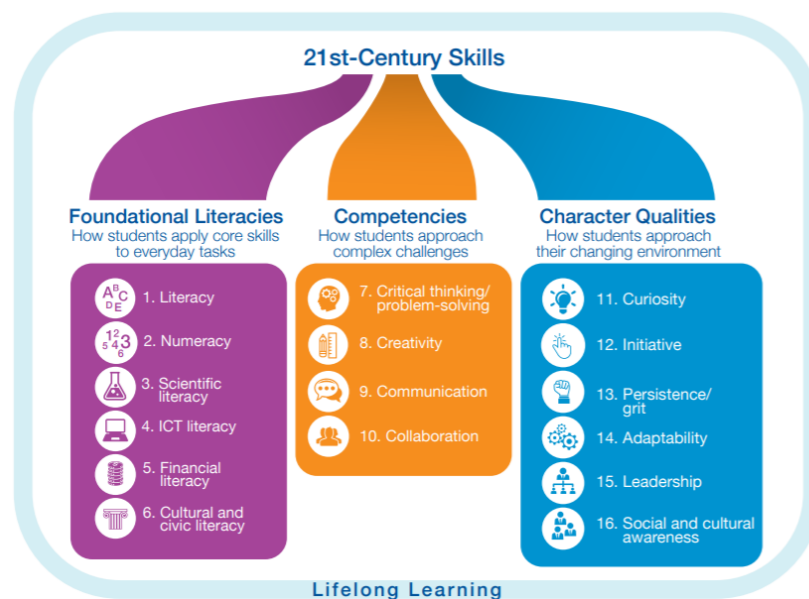


Figure 1 16 skills for the 21st century (source adopted from World Economic Forum, 2016)

"What we need are universities that are unbelievably creative and unbelievably dynamic in their issues of discovery." (Crow & Dabars, 2015), and developing the competencies of each student. Hence, incorporating the concept of teaching design thinking skills to students as part of general education for the 21st century is very much a necessity.

Design Thinking

Design thinking focuses on human-centric, collaborative problem solving and innovation. According to Tim Brown, "Design thinking is a human-centered approach to innovation that draws from the designer's toolkit to integrate the needs of people, the possibilities of technology, and the requirements for business success (source: IDEO website). Design thinking promises to provide realistic, practical, and innovative solutions to problems and gives a systematic approach to finding solutions. Design thinking addresses the needs of the people, incorporates users' insights in brainstorming ideas, build rapid prototypes and tests out solutions.

Soft Skills in Design Thinking

Davis, Hawley, McMullan and Spilka (1997: xiv) made reference to the “growing evidence that design is a powerful tool for transforming curriculum and accommodating the variety of ways in which students learn” by applying knowledge in practice. Design Thinking is an approach to learning that focuses on developing students’ confidence through hands-on projects while developing skills and competences. “A design competency is defined as: the knowledge (as it relates to thinking, cognition); the skills (doing, making); and the behaviours (feelings, attitudes, motivations) students need to master” (Rutgers, 2015:35) and at the same time to understand business.

Competencies and qualities in Social and Emotional Learning (SEL) can be observed to identify students’ approach to solve complex challenges. By applying Design Thinking among the university students, competencies can be observed through the participation of the entire team; from identifying a “wicked problem”, discovering the unmet needs from the users, defining the challenge, brainstorming ideas and building the prototype to test and iterate. Also, character qualities in SEL emphasize that self-learning drives students to research, experiment, iterate, and take ongoing risks. Students possess the motivation and attitude to learn, reflect on what they learn throughout this process and redirect when necessary.

Purpose of the Study

The purpose of the study is to explore the effectiveness of Design Thinking in developing the Social and Emotional Learning (SEL) competencies and character qualities in students. The research will focus on these questions:

1. What are the SEL character qualities that developed by the university students in Design Thinking?
2. What are the SEL competencies developed from the university students in Design Thinking

Research Methodology

The participants in this research are undergraduate students who enrolled for a general paper course, which is Design Thinking. A total number of 92 participants who took part in the survey are from different nationalities, age group, semesters and various degree programmes. The SEL competencies and character qualities are adapted in this study to find out how the participants approach challenges. The participants were given a set of likert-scale statements to reflect on their competencies and character qualities. In addition, a section for written feedback was provided to the participants to garner feedback on their learning experience.

Findings and Discussion

This section focused on the survey results that incorporated the SEL character qualities focusing on (i) initiative and (ii) persistence, and SEL competencies; (1) critical thinking and problem solving, (ii) communication, (iii) collaboration and (iv) creative thinking.

Table 1 Students' initiative and persistency towards Design Thinking

No	Items	Agree (%)	Neutral (%)	Disagree (%)	Std. Dev.
1	When I was learning Design Thinking, I was willing to spend time to work on my group project.	64.13	28.26	7.61	0.9088
2	When I was learning Design Thinking, I was actively involved in my group project.	76.09	17.39	6.52	0.7822
3	When I was learning Design Thinking, I contributed my knowledge and skills in the group project.	72.83	23.91	3.26	0.8445
4	When I was learning Design Thinking, I treated the group project as a challenge and faced it positively.	67.39	21.74	10.87	0.9577
5	When I was learning Design Thinking, I took initiative to search information and think of potential solutions.	64.13	30.43	5.43	0.9484
6	When I was learning Design Thinking, I took initiative to consult with my instructor when I face any problems.	59.78	29.35	10.87	0.9061

Based on the table 1, all 6 items are related to the SEL character qualities, focusing on initiative and persistence. Overall, the items showed positive findings. Based on the standard deviation obtained from the data, it is clear that the items were reliable as they fall in between 0.5 and 1.0. Two of the items (2 & 3) had very significant number of participants who agreed they had actively involved (76.09%) and also contributed their knowledge and skills (72.83%) in the group project. Three items (1, 4 and 5) showed positive responses from the participants, which are above 60%. From the list of items, it indicated that most of the participants exhibited initiative and persistency in design thinking. Last but not least, item 6 had the lowest positive standing which is 59.78%. There is a higher percentage of the participants provided a neutral stand as opposed to negative findings. The negative findings ranges from 3.26% to 10.87%.

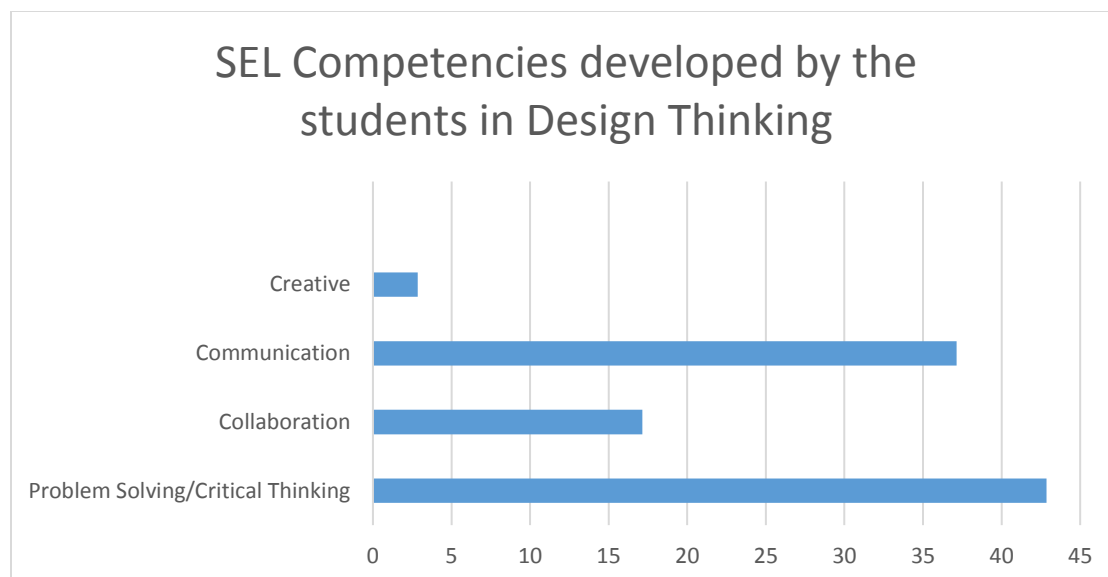


Figure 2 Percentage of SEL Competencies developed by the students in Design Thinking

From data collected, only 37 out of 92 participants provided their personal responses for this feedback section. The responses were classified into four (4) themes: (i) critical thinking and problem solving, (ii) communication, (ii.) collaboration, and (iv) creative thinking. The findings of the themes are in the figure 2.

Based on the figure 2, the highest and most positive theme is problem solving and critical thinking with a total of 45.09%. Based on the high percentage, it indicates a majority of the participants underwent a great deal of problem solving and critical thinking through Design Thinking where they were challenged to provide practical solutions. Some of them mentioned that the input from the industry experts during the mentoring and judging sessions had provoked and challenged them to think about their solutions in depth. This is then followed by communication, which stands at 37.14%. The participants mentioned that they communicate with the mentor and their group members throughout the Design Thinking process.

In addition, the participants mentioned that they gained a great deal of team skills where they would have to work collaboratively with one another to ensure that their ideas were delivered well not only to the mentors but also to the judges during the final pitch. Thus, the findings indicated 17.14% of the participants displayed collaboration as one of the SEL competencies. Interestingly, 2.86% wrote in the feedback that they learnt creative thinking skills when they generated solutions. They enjoyed creating new outputs such as mobile application or new products.

Conclusions

Social and emotional skills are critical to the workforce of the future (World Economic Forum, 2016:4). Competencies and character qualities in the Social and Emotional Learning (SEL) are achieved when the students take charge of their learning, and also curate information for themselves when they solve complex challenges.

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