RESEARCH ON THE EFFECTS OF USING DESIGN THINKING AS AN IDEATION TOOL

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Chapter 1: Introduction

Design thinking is a “human-centered approach to innovation that draws from a designer's toolkit to integrate the needs of people, the possibilities of technology, and the requirements for business success” (IDEO U, 2018, para. 1). It is best suited for “tackling complex problems that are ill-defined or unknown” because of its human-centered approach to problem-solving (Dam & Siang, 2018, para. 4). Several companies like Apple, Google, and Nike use the framework for problem-solving, product development, and user understanding. However, there exists an ongoing debate among practitioners and scholars about its efficacy, and little-to-no data exists to support either side’s claim.

Proponents of design thinking argue that it “enables its users to come up with a solution that nobody has before” (Tischler, 2009, para. 3). They claim that businesses and nonprofit organizations have embraced design thinking because its human centered-approach to innovation helps them to create innovative products and services (Brown & Wyatt, 2010). Proponents of design thinking assert that it gives people that use it the creative confidence to tackle complex problems (Camacho, 2016). Conversely, critics of design thinking have argued that the ideas generated through design thinking could have been produced through different means (Jen, 2017). They contend that design thinking is not as useful as its proponents claim and that it is a “failed process because its success rate is low” (Nussbaum, 2011, para. 6). They also assert that results generated from design thinking sessions cannot be replicated in a different setting, even when the problem statements are the same.
Furthermore, proponents of design thinking have provided different definitions of the framework to highlight its qualities. Kelley describes design thinking as an innovation “methodology that enables us to come up with a solution that nobody has before” (Tischler, 2009, para. 3). He asserts that design thinking strategies give people that use it the creative confidence to tackle complex problems. He also asserts that this creative confidence is gained from the knowledge that the process and strategies of design thinking have been used to produce positive results numerous times (Camacho, 2016). Kelley also notes that design thinking takes the burden of creativity away from the individual and places it on the group that is assembled for design thinking a session.

For 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” (IDEO, 2018, para. 1). Furthermore, Brown asserts that the design thinking toolkit can be used by different types of organizations to innovate for different kinds of problems/problem spaces. He also remarked that users play a focal role in the design thinking process; this is because problems are evaluated/investigated primarily from the world view of users and before the consideration of the possibilities of technology.

Lockwood (2010) describes design thinking as “a human-centered innovation process that emphasizes observation, collaboration, fast learning and visualization of ideas, rapid concept prototyping and concurrent business analysis, which ultimately influences innovation and business strategy” (Lockwood, 2010, p. xi). He also underscores the importance of user observation and research in the design thinking
process. According to Lockwood, design thinkers are expected to immerse themselves in the environment and lived experiences of the audience for whom they are creating a product. This immersion helps them to see the problem(s) under review from the perspectives of the users.

Stanford University’s d.school refers to design thinking as “a glue that brings teammates together around a common goal: make the lives of the people they are designing for better” (the d.school, 2012, p. 1). For the d.school team, design thinking is potent because “it draws on methods from engineering and design, and combines them with ideas from the arts, tools from the social sciences, and insights from the business world” (the d.school, 2012, p. 1). Their definition of design thinking also highlights the importance of using interdisciplinary teams for design thinking sessions. According to the d.school philosophy, assembling a team comprised of individuals with different perspectives, skills, and backgrounds increases the potency of the design thinking session.

Melles (2011) defines design thinking as a “human-centered ‘open’ problem-solving process decision makers use to solve real world ‘wicked’ problems” (Melles, 2011, p. 1). Wicked problems in this context refer to problem spaces that are difficult to be scoped and whose solution requires an interdisciplinary approach (Buchanan, 1992). His definition of design thinking emphasizes the importance of using design thinking to tackle social problems that are either ill-defined or that have many socio-economic constraints. In summary, all the above definitions highlight that the human-centered approach offered by design thinking makes it very useful for tackling
complex problems. They also emphasize that both businesses and nonprofit organizations can use the framework as their preferred approach to innovation. Finally, the definitions underline the importance of using interdisciplinary teams for design thinking sessions.

Despite claims that design thinking is an effective ideation technique, its critics have questioned its potency. Nussbaum (2011), a one-time advocate for design thinking, now refers to it as a “failed experiment.” He states that the practitioners of design thinking have acknowledged that “the success rate for design thinking is very low” (para. 6) and that this means that it is a failed process. Jen (2017) criticizes design thinking from the perspective of a designer. For her, design thinking is nonsense because there is no provision for critique in the design thinking process. She states that critique gives designers the ability to criticize each other’s work in order to make it better. Similarly, she also criticized design thinking for reducing the process of design “to a single tool that is called 3M Post-Its” (Jen, 2017).

Furthermore, Maciver, et al. (2016) write that “while in theory, the design thinking approach emphasizes the value of interdisciplinarity in each phase, in practice, this has been problematic” (p. 9). They highlight the difficulty of bringing together interdisciplinary teams that use different problem-solving strategies from their respective fields. To support this argument, they reference an example of scientists and art oriented-scholars collaborating on a project. While a scientist prefers the use of a logical approach, an artist would prefer the use of intuition and creativity. They assert that
when not balanced, the combination of these methods could lead to an unproductive and chaotic sessions.

In spite of the relative expertise on both sides of the design thinking argument, these competing claims are supported by very little evidence. The current state of research within the field is more focused on the applications of design thinking in various fields and problem-spaces, rather than on the effects it has on the ideation process. Thus, there is a need to investigate the design thinking process and compare it to other strategies for ideation to uncover insights into areas where design thinking is effective, as well as where it falls short.

For these reasons, this pilot experiment explores design thinking as compared to ideation sessions that do not use a predefined set of strategies. It chronicles an experiment with thirty-four participants who were divided into two categories: general ideation and design thinking. Within each category, smaller groups were convened. Groups in the general ideation category were asked to develop ideas for solving a specific problem using any method of choice (other than design thinking). Groups within the design thinking category were asked to use a design thinking strategy called “saturate and group” to develop ideas to solve the same problem. The prompt for the ideation session was: “How might we get Ball State University students to eat healthily?”

This research hypothesizes that the design thinking strategy “saturate and group” is a more effective idea generation process than an ideation session that does not use a predefined set of strategies to guide the process. Furthermore, findings from the experiment are be used to address the following research questions:
RQ 1: What differences emerge between an ideation session that uses a specific design thinking strategy versus one that does not use a predefined set of strategies to guide the process?

RQ 2: In what ways do the quality and quantity of ideas generated differ between an ideation session that uses a specific design thinking strategy versus one that does not use a predefined set of strategies to guide the process?

RQ 3: How do participants’ perceptions of the ideation processes differ between a session that uses a specific design thinking strategies versus one that does not use a predefined set of strategies to guide the process?

This research is important for three reasons. First, it provides an opportunity to investigate the effects of using design thinking as an idea generation strategy vis-à-vis when groups are left to their own devices. Second, the research provides data about the ways in which design thinking contributes to problem solving, as well as where it falls short. Third, the study adds to the body of knowledge available about the overall effects of design thinking on problem solving. The following chapters offer a review of literature, research methodology, research results, and a discussion that expands on the significance and contributions of this research.
Chapter 2: Literature Review

David Kelley is an American entrepreneur, designer, and scholar. He is also the founder of IDEO, an innovation consulting firm, as well as co-founder of Hasso Plattner Institute of Design, a prominent design thinking institute located in Stanford University. In a recent interview, Kelley acknowledged that the term design thinking has a dual origin, meaning, and application (Camacho, 2016). He classified its applications in two ways: 1) design thinking that is used in the fields of architecture and engineering for the design of new tools, and 2) design thinking that businesses use for the innovation of new products and services. The design thinking that is used in the fields of architecture and engineering was championed by Arnold, Archer, and Simon, and was first used in the 1960s. The second application of design thinking was founded by Kelley, circa 2001 (Brown & Wyatt, 2010). This application of design thinking is often used by business for innovation or conception of new products or services. For this project, the design thinking we refer to is the version founded by Kelley.

Brief History of Design Thinking

The origin of design thinking in its current usage can be attributed to the innovation consulting firm IDEO under Kelley, and its present CEO Brown (Liedtka, 2015). Kelley traces the history of the term to an encounter with his employees in which he tried to explain to them that they are masters of a specific way of thinking about design (Camacho, 2016). He claimed that “every time someone asked him about design, he found himself inserting the word ‘thinking’ to explain what it was that designers do. Eventually, the term design thinking stuck” (Brown & Wyatt, 2010, p. 33).
The events that led to Brown’s particular application of design thinking began in 2001 when IDEO was frequently asked by various organizations to work on projects that were unrelated to the field of design (Brown, 2009). The requests by these organizations launched IDEO into the field of design for both traditional products and social services. To differentiate between their traditional design work and the new projects that are unrelated to conventional design work, they designated this new field as design with a small ‘d’ (Brown, 2009).

The field grew further when two new design thinking institutes were created to advance the research and teaching of the design thinking strategies: The Hasso Plattner Institute of Design more commonly known as the Stanford d.school, founded in 2005 and the Hasso Plattner Institute School of Design Thinking at Potsdam, founded in 2007. Moving forward, several organizations adopted the methodology as their innovation framework. IDEO commenced using it to tackle complex social problems while other organizations like Apple, Google, and Nike, used it for product development, user understanding, and problem-solving. Thus, the use of design thinking as an approach to innovation has grown over the years and is now adopted in different problem spaces and corporate sectors. In summary, the work of Kelley, Brown, IDEO, and Stanford University’s Hasso Plattner Institute of Design laid the foundation for the current practice of design thinking. While Kelley originated the term design thinking, the work of Brown provided a widely adopted academic literature for the field. Similarly, IDEO and Stanford University’s Hasso Plattner Institute of Design led the adoption of the framework in the business and education sectors.
Design Thinking Philosophy, Methods, and Processes

Design thinking is built on three major foundations: design thinking philosophy, methods, and processes.

![Design Thinking Philosophy, Processes, and Methods (Edited version) (Mann, 2018, fig. 1)](image)

**Design Thinking Philosophy**

Design thinking philosophy is the framework that guides designers on how to approach design thinking sessions. According to d.school (2018, p.3), design thinkers should:

1. Focus on human values. They should show empathy for the people for what they are designing.
2. Trust and adhere to the design thinking process.
3. Embrace rapid experimentation and prototyping.
4. Communicate their vision in an impactful and meaningful way.
5. Have a positive bias towards actions and not just thinking.
6. Produce a coherent vision out of messy problems. Frame it in a way to inspire others and to fuel ideation.
7. Bring together innovators with varied backgrounds and viewpoints when conducting design thinking sessions. (d.school 2018, p.3)

**Design Thinking Processes**

The design thinking process has evolved over the years. Previously circa 2009, design thinking focused on the following processes: *understand, observe, define, ideate, prototype, and test* (Ratcliffe, 2009). The new steps, which were introduced circa 2010 by Stanford University’s d.school, include; *empathize, define, ideate, prototype,* and *test* (d.school, 2018). The significant difference between the old and new processes is that the understand and observe steps in the old process were combined to form the *empathize* step in the new design thinking process.

The empathy stage is the first step of the design thinking process. This stage allows design thinkers to “observe, engage and empathize with users in order to understand their motivations and what is most important to them” (Dam & Siang, 2017, para. 3). Empathy for users could be built through empathy research or ethnography studies. This stage uses the human-centered approach that asks the question of *why* to gain insight about the challenges the users face (Hasso Plattner Institute of Design, 2010). At the end of this stage, designers are expected to achieve a clear understanding of the problem at hand, why that problem exists, and its adverse effect on the lives of users.
The *define* phase is the period of “sense making” (Hasso Plattner Institute of Design, 2010, p. 2). Here, design thinkers are expected to analyze and synthesize the problems that have been discovered so far to tackle it from a human-centered perspective (Dam & Siang 2, 2018). At this stage, they are also expected to surround themselves with visuals and user quotes from the empathy stage to help them understand and define the problem from the perspective of users rather than from their assumptions. The end product of the define stage is usually a clear, meaningful, and actionable problem statement that chronicles the challenges faced by users and should be based on the designers understanding of the people and the problem space (d.school, 2018). The define phase is important because it leads to the generation of “explicit expression of the problem the designers are striving to address” (Hasso Plattner Institute of Design, 2010, p. 3).

The *ideation* phase focuses on idea generation. Here, design thinkers “transition from identifying problems into exploring solutions for the users” (Hasso Plattner Institute of Design, 2010, p. 4). To innovate for the problem space, designers – often form an interdisciplinary team – to brainstorm about possible solutions for the unfulfilled needs of users. Using an interdisciplinary team for the ideation session helps ensure that there are a variety of ideas and diversity of perspectives. At this stage, it is often recommended that ideas be generated before being evaluated or criticized. This approach enables the team to come up with as many ideas as is possible and also to ensures that all members of the team are free to contribute ideas without being
criticized. In summary, this is the phase in design thinking that is dedicated to user-centered innovation.

The prototyping stage involves “producing inexpensive, scaled down versions of the product or specific features found within the product so that they can investigate the problem solutions generated in the previous stage” (Dam & Siang, 2017, para. 8). The prototyping stage typically involves three steps: low-fidelity prototyping, which typically involves paper sketches of the proposed ideas; medium-fidelity prototyping, which typically involves a barely functional design of the proposed solution; and high-fidelity prototyping, which usually involves a complete but not yet deployed end-product. This stage allows designers to test and refine their ideas based on the feedback they get from users. It also gives designers a chance to fail without consequences. Each iteration of prototypes should incorporate feedback generated from the previous testing with users.

Finally, the test stage is a “chance for design thinkers to get feedback about their solutions or refined solutions to make improvements” (d.school, 2018, p. 5). At this stage, “designers must return to users for feedback and ask them whether the solution meets their needs” (Gibbons, 2016, para. 17). The d.school recommends that as a “rule of thumb: always prototype as if you know you are right, but test as if you know you are wrong—testing is the chance to refine your solutions and make them better” (Hasso Plattner Institute of Design, 2010, p. 6).
Design Thinking Strategies

Design thinking strategies are the user-centered techniques used by design thinkers to execute a project. The reason for this is that the strategies are structured in a way that ensures that the users and the problem space are visible throughout the lifecycle of the design thinking project. Some design thinking strategies include:

- **Assume a beginner’s mindset:** Assuming a beginner’s mindset allows design thinkers to build genuine empathy for the users that they are designing for. Building empathy is crucial because sometimes our experiences, assumptions, misconceptions, and stereotypes can block us off from understanding the struggles of a user/beginner (d.school, 2018). Requirements for this technique include “don’t judge the users, question everything, be truly curious, find patterns, listen as much as possible” (d.school, 2018, p. 9).

- **What? How? Why?:** The goal of this strategy is to understand what the problem is, how the problem affects the users, and why the problem affects the users. This strategy requires close observation of the users and the problem. It also allows designers to “move from concrete observations of a particular situation to the more abstract emotions and motives that are at play in that situation” (d.school, 2018, p. 10). This strategy requires design thinkers to “start with concrete observations (What), move to understanding (How) and then step out on a limb of interpretation (Why)” (d.school, 2018, p. 10).

- **Interview for empathy:** This technique entails talking to users to “understand their thoughts, emotions, and motivations” (d.school, 2018, p. 13). When
conducting empathy interview design thinkers should, “encourage stories, look for inconsistencies, pay attention to nonverbal cues, don’t be afraid of breaking the silence during the interview, don’t suggest answers to your questions, ask questions neutrally, always ask why to get deeper insights” (d.school, 2018, p. 13).

- **Saturate and group**: This strategy helps design thinkers “unpack thoughts and experiences into tangible and visual pieces of information to draw inspiration from them” (d.school, 2018, p. 17). Here, design thinkers surround themselves the data that they have generated about the user and the problem space. The goal is to begin to make connections with respect to the gaps that cause the problems and then begin to generate insights that would be useful in tackling the problem space.

- **How might we? questions**: This strategy encourages design thinkers to frame a design challenge as a specific question that can be used to facilitate ideation sessions (d.school, 2018). The goal is to begin to think deeply about possible solutions that may not occur unless designers think deeply about users and the problem space. Some of the things to consider when using the How Might We? strategy includes “questioning an assumption, creating an analogy from need or context, and changing a status quo” (d.school, 2018, p. 29).

There are more than 40 design thinking strategies that facilitators can use to innovate for different problem spaces. Design thinkers also have the liberty to use a combination of the different strategies of design thinking when necessary. However,
some design thinking strategies are best suited to certain phases. The table (1) below highlights the five phases of design thinking and some of the strategies that may be best suited for each phase.

Table 1. Design thinking phases and strategies (d.school, 2018)

<table>
<thead>
<tr>
<th>S/N</th>
<th>Design thinking phases</th>
<th>Design thinking strategies</th>
</tr>
</thead>
</table>
| 1   | Empathize               | · Assume A Beginner’s Mindset  
|     |                         | · User Camera Study  
|     |                         | · Interview for Empathy  
|     |                         | · Engage with Extreme Users |
| 2   | Define                  | · Saturate and Group  
|     |                         | · Story Share and Capture  
|     |                         | · Empathy Map  
|     |                         | · Journey Map  
|     |                         | · Composite Character Profile |
| 3   | Ideate                  | · Why-How Laddering  
|     |                         | · Point-Of-View Madlib  
|     |                         | · “How Might We” Questions  
|     |                         | · Brainstorming  
|     |                         | · 2X2 Matrix |
| 4   | Prototype               | · Prototype for Empathy  
|     |                         | · Prototype to Test  
|     |                         | · Prototype to Decide  
|     |                         | · User-Driven Prototyping  
|     |                         | · Wizard of Oz Prototyping |
| 5   | Test                    | · I Like, I Wish, What If  
|     |                         | · Feedback Capture Grid |

Brown and Wyatt (2010) write that “design thinking can feel chaotic to those doing it for the first time. However, over the life of a project, participants will see that the process makes sense and achieves results, even though its form differs from the linear,
milestone-based processes that organizations typically undertake” (p. 33).

Hawryszkiewycz, Pradhan, and Agarwal, (2015) recommend the application of divergent and convergent thinking for the ideation phase of design thinking. They write, “divergent thinking offers many possible unique and different ideas within a given topic domain while convergent thinking helps to narrow down the topic or domain in coming up with a solution” (p. 5). Similarly, Brown & Wyatt (2010) recommend that it is essential to have a diverse group of people involved in the process; this is to help the team to achieve divergent thinking.

**Criticism of Design Thinking**

Despite the claim by the proponents of design thinking that it helps its users to come up with new and even better ideas, critics argue that the ideas generated through design thinking could have been generated through other means (Jen, 2017). Criticism of design thinking can be categorized into the following eight arguments:

1. Design thinking works but its strategies are not new.
2. Ideas generated through design thinking could have been generated through other, faster means.
3. Design thinking is a fad that it’s time on the stage has ended.
4. The outcomes of design thinking will differ significantly from team to team even when they are solving the same problem and using the same strategies.
5. The success of design thinking sessions rests mainly on the intellectual ability of the participants and not on the design thinking process.
6. Proponents of design thinking do not place a limit on what fields to which design thinking can be applied to.

7. Design thinking is not the real driver of innovation. Rather, participants would have come up with good ideas without design thinking strategies and processes.

8. There is no practical way to measure whether proposed solutions actually worked or simply appeared to work.

Nussbaum (2011), a one-time advocate for design thinking, now refers to it as a "failed experiment." He states that the practitioners of design thinking have acknowledged that "the success rate for design thinking is very low" (para. 6) and that this means that it is a failed process. According to Merholz (2009), "design thinking alone is not sufficient" (para. 3) because it acquires its potency from other ways of thinking, such as business thinking, journalism thinking, calligraphic thinking, historian thinking among other. Essentially, Merholz highlights that design thinking benefits from the diverse academic backgrounds of the participants that are assembled for the design thinking session. He recommends that the process could be better framed as interdisciplinary design rather than design thinking to give more credit to the other fields that participate in the design thinking process.

Maciver, et al. (2016) write that "while in theory, the design thinking approach emphasizes the value of interdisciplinarity in each phase, in practice, this has been problematic" (p. 9). They highlight the difficulty of bringing together interdisciplinary teams that use different problem-solving strategies in their respective fields. They cite the example of scientists and art oriented-scholars. While a scientist prefers the use of a
logical approach, an artist would prefer the use of intuition and creativity. They assert that when not balanced, the combination of these strategies could lead to an unproductive and chaotic design thinking session.

Jen (2017) criticizes design thinking from the perspective of a designer. She asserts that design thinking is nonsense because there is no provision for critique in the design thinking process. She also states that critique gives designers the ability to criticize each other’s work in order to make it better. Likewise, she criticizes design thinking for reducing the process of design “to a single tool that is called 3M Post-Its” (Jen, 2017). Walters (2011) writes that the packaging of the design thinking process as “a codified,repeatable, reusable practice contradicts the nature of innovation” (Walters, 2011, para. 4). She asserts that design should be messy and unpredictable because the problems that are being solved often appear in an illogical or unsynchronized format. Walters also criticized design thinking for handling innovation like a one-off workshop in which all answers are provided within the duration of the workshop.

Iskander (2018) states that design thinking is “a new name for an old method of problem-solving that is called the rational-experimental technique” (Iskander, 2018, para. 4). She adds that the difference between both methods is in nomenclature but not in meaning. Iskander also argued that the design thinking process gives an undue advantage to designers because they are “the vessel through which all the implicit understandings that make it into the final design must first pass” (Iskander, 2018, para. 10). This advantage is highlighted by the fact that they are the ones that design the prototypes and the final product. Often, they are the ones that translate the ideas
generated from the ideation phase into a physical product. She remarked that they often
do so based on their biases; forcing the team only to criticize whatever they come up
with and not as part of the creative process.

The next section details the research methodology that was employed for the
study. It also highlights how the participants were recruited, the settings of the study,
and the procedures adopted for the experiment.
Chapter 3: Methodology

This study employed qualitative research methods, including focus group sessions and a questionnaire, to investigate the use of design thinking as an ideation tool. Results from the sessions were analyzed through a Mann-Whitney U test and qualitative comparative analysis. Findings from the research were also used to answer the following research questions:

**RQ 1:** What differences emerge between an ideation session that uses a specific design thinking strategy versus one that does not use a predefined set of strategies to guide the process?

**RQ 2:** In what ways do the quality and quantity of ideas generated differ between an ideation session that uses a specific design thinking strategy versus one that does not use a predefined set of strategies to guide the process?

**RQ 3:** How do participants' perceptions of the ideation processes differ between a session that uses a specific design thinking strategies versus one that does not use a predefined set of strategies to guide the process?

**Overview**

This research used the focus group framework for ideation sessions that asked participants to generate ideas for a particular problem statement. A closed-ended questionnaire was also administered to explore participants' perceptions of the ideation experience. The questionnaire contained five questions with Likert-scale multiple choice answers. The data that was generated from the questionnaire was transcribed and analyzed using the qualitative comparative analysis methodology. According to Nayab
(2019), “comparative analysis involves analyzing data from different settings or groups but belonging to the same point in time and/or the same settings, to identify similarities and differences” (para. 14).

**Participants, Setting and Problem Space**

The experiment was conducted at Ball State University, a mid-sized, Midwestern university in Muncie, Indiana. Participants were required to be at least 18 years old at the time of the study. A total of 34 participants were divided equally into two categories: general ideation and design thinking. Two sessions were conducted for the general ideation category, with 7 participants in the first group, and 10 participants in the second group. Similarly, two sessions were conducted for the design thinking category, with 7 participants in the first group, 10 participants in the second group.

Participants were given a problem statement to guide their ideation: “How might we get Ball State University students to eat healthily?” The problem statement that was chosen would not require participants to have specialized knowledge before they could participate. We also considered the scope of the problem and whether the challenge is commonly considered to be a problem by the community. Additionally, the researcher and research assistants had already conducted prior research on this topic for another project, and as such, we had considerable knowledge about the problem space.

**Research Instruments and Procedure**

All groups were provided with the same materials: whiteboards, sharpie markers, post-it notes, pens, pencils, and a pack of US letter (8.5 x 11) paper. They were
required to spend a maximum of one hour for the ideation session and the post-session questionnaire. The table below summarizes the activities for each session.

**Table 2. This table highlights the breakdown of the focus group procedure.**

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Introduction:</strong></td>
<td>10 minutes</td>
</tr>
<tr>
<td>Participants were given a brief overview of the research purpose.</td>
<td></td>
</tr>
<tr>
<td><strong>Focus Group Sessions:</strong></td>
<td>10-40 minutes</td>
</tr>
<tr>
<td>Each group was given the problem statement and asked to brainstorm solutions. The design thinking group (only) were further briefed on the saturate and group design thinking strategy.</td>
<td></td>
</tr>
<tr>
<td><strong>Post-session Questionnaire:</strong></td>
<td>10 minutes</td>
</tr>
<tr>
<td>Participants were asked to rate their perceptions of the session.</td>
<td></td>
</tr>
</tbody>
</table>

*Introduction:* Before the sessions commenced, participants were given a brief overview of the research objectives. During the sessions, the investigator was on hand to answer any questions and to keep track of time. The sessions were recorded for future review.

*Focus group session protocol:* Groups in the general ideation category were asked to nominate one person from their team to facilitate their session. The facilitator was chosen from among the participants to ensure that the session was not influenced by the researcher, who is a trained design thinking facilitator. After a facilitator was nominated, the problem statement was read with instructions about how long the session should last. The group was then allowed to conduct its focus group session using any structure for idea generation it wanted (other than a specific design thinking strategy). The basic requirement was for the group to generate ideas for solutions to the
problem statement. At the end of the session, a questionnaire designed to elicit feedback about how participants felt about the process was distributed. The researcher observed the interaction among members of the group as well.

Groups in the design thinking category were given a brief overview of the saturate and group design thinking process and instructed they would use it to generate ideas for solutions to the problem space. Next, the facilitator led them through a saturate and group session. After the session, a questionnaire designed to elicit feedback about how participants felt about the process was distributed.

*Post-session Questionnaire:* The following questions were included in a questionnaire that was used to gauge participants’ perceptions of their focus group sessions:

- Was the session collaborative and supportive?
- Was the session creative and stimulating?
- Did you feel like your ideas mattered?
- Did you feel like you had a voice during the sessions?
- Would you want to participate in this type of session again?
- What is your area of expertise/occupation?

**Data Analysis Procedure**

Participants in both categories wrote down their ideas on Post-it notes. The ideas were transcribed, assessed for quality by three independent judges, and analyzed using the Mann-Whitney U test method. Similarly, participant responses to the Likert-scale questionnaire were analyzed using qualitative comparative analysis methodology.
Independent Judges: Three professionals who are experienced in the problem space were recruited to assess the quality of the ideas that were generated from the focus group sessions. This approach was adopted to ensure that the assessment of the ideas is unbiased. As such, the primary researcher – who designed the experiment – was excluded from serving as a judge. Furthermore, the following steps were taken in the selection of the judges: 1) Judges were originally selected because each had recently worked on a nutrition-related project that required deep knowledge of the problem space. 2) All the ideas that were assigned to the judges were stripped of the name of the categories and groups that produced them. 3) The three judges graded each idea. Thus, each idea was assessed three times, and the final score was the average of the three. This approach was adopted to ensure that the bias of any of the judges did not affect the final score.

Result Analysis procedure: Results from the sessions were analyzed to explore the following insights: the quantity of ideas generated, quality of the ideas generated, participants’ perceptions about their respective focus group sessions. The quantity of ideas was determined through a physical count of all ideas that were produced during the focus group sessions. This count allowed the researchers to determine which group and category generated the largest number of ideas. All ideas generated from the ideation sessions were also assessed to determine the group that produced the most quality ideas. Judges evaluated each idea based on the following variables: innovative, actionable, relevant, creative, valuable, unique, and realistic. The following definitions were implemented to further guide judges’ work:
1. Innovative – Is the idea original (in the community)?

2. Actionable – Is the idea capable of being translated into a product or service with little limitations?

3. Relevant – Is the idea useful to the problem at hand?

4. Creative – Does the idea show signs of an in-depth thought process?

5. Valuable – Is the idea very essential to solving the problem at hand?

6. Unique – Is the idea a rare or uncommon but positive solution to the problem at hand?

7. Realistic – Will the idea be too difficult to implement considering scarce resources?

Judges rated each idea using a Likert-scale assessment that included the following options: (1) strongly disagree, (2) disagree, (3) neutral, (4) agree, (5) strongly agree. After the judges assessed the ideas, the researcher computed the results and analyzed them using the Mann-Whitney U test. Finally, responses to the questionnaire designed to elicit participants’ perceptions about the focus group session were assessed through a qualitative comparative analysis. The next chapter discusses, in detail, the results that were generated from the focus group sessions and the questionnaires.
Chapter 4: Results

This thesis employed a qualitative research framework, including focus group sessions and a questionnaire to investigate design thinking as an ideation tool. The research set out to uncover the areas where design thinking is an effective strategy for ideation and problem-solving, as well as where it falls short. Findings from the focus group sessions and the post-study questionnaire are chronicled below.

Focus Group Session Results

*Quantity of ideas generated:* The participants (n = 34) generated a total of 162 ideas during the focus group sessions, with participants in the design thinking category (n = 17) generating 102 ideas and participants in the general ideation category (n = 17) generating 60 ideas. Further analysis of this data reveals that participants that used the design thinking strategy produced an average of six ideas per participant, while those in the general ideation category generated an average of three-and-one-half ideas per participant. Figure 2 illustrates these findings.
Figure 2. This chart shows a breakdown of all the ideas that were generated from the focus group sessions \((n = 162)\), as well as a comparison of the two main categories.

Furthermore, the first design thinking group generated 49 total ideas, while the second design thinking group generated 53 total ideas. The first general ideation category group generated 21 total ideas, while the second general ideation category group generated a total of 39 ideas. Thus, in both categories, the number of ideas generated was relatively similar for each group. Table 3 illustrates this breakdown.

Table 3. This table shows the breakdown of ideas per group.

<table>
<thead>
<tr>
<th>S/N</th>
<th>Design thinking category</th>
<th>No. of ideas</th>
<th>General ideation category</th>
<th>No. of ideas</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Group One (Participants - 7)</td>
<td>49</td>
<td>Group One (Participants - 7)</td>
<td>21</td>
</tr>
<tr>
<td>2</td>
<td>Group Two (Participants - 10)</td>
<td>53</td>
<td>Group Two (Participants - 10)</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>102</td>
<td>Total</td>
<td>60</td>
</tr>
</tbody>
</table>
**Quality of ideas generated:** The quality of the ideas (n = 162) that were generated during focus group sessions were evaluated by three independent judges. Each idea was rated on seven quality variables – innovative, actionable, unique, relevant, creative, valuable, and realistic (Table 4). Subsequently, the ideas generated during the design thinking sessions (n = 102) and the general ideation sessions (n = 60) were tested for statistical significance using the non-parametric Mann-Whitney U test. The statistical significance level was set at p < .05.

**Table 4. This table shows an example of how some of the ideas were graded.**

<table>
<thead>
<tr>
<th>S/N</th>
<th>Ideas</th>
<th>Innovative</th>
<th>Actionable</th>
<th>Unique</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Make plate smaller</td>
<td>Strongly Disagree</td>
<td>Agree</td>
<td>Disagree</td>
</tr>
<tr>
<td>2</td>
<td>Express line for healthy meals</td>
<td>Agree</td>
<td>Agree</td>
<td>Agree</td>
</tr>
<tr>
<td>3</td>
<td>Market academic benefits of healthy eating</td>
<td>Disagree</td>
<td>Agree</td>
<td>Disagree</td>
</tr>
<tr>
<td>4</td>
<td>App for tracking food</td>
<td>Strongly Disagree</td>
<td>Neutral</td>
<td>Strongly Disagree</td>
</tr>
<tr>
<td>5</td>
<td>Community garden teach and involve</td>
<td>Strongly Agree</td>
<td>Agree</td>
<td>Strongly Agree</td>
</tr>
</tbody>
</table>

Findings from the Mann-Whitney U test revealed that there is no statistically significant difference between the quality of ideas generated by the participants in the design thinking category and those in the general ideation category. A breakdown of the findings according to each variable are illustrated in the charts below.

A Mann-Whitney U test was run to determine whether there were differences between innovation scores for ideas that were generated by the design thinking and the general ideation categories. Findings from that assessment revealed that the
distributions for the innovation scores for both categories were not similar as assessed by visual inspection (Figure 3). However, despite the difference in distributions, the innovation scores for the design thinking category (mean rank = 76.98) and the general ideation category (mean rank = 89.18) were not statistically different, U=3,521, z = 1.706, p = .088. (Figure 3)

![Independent-Samples Mann-Whitney U Test](image)

**Figure 3.** This chart illustrates that the distributions of the design thinking and the general ideation categories were not similar for the innovative variable.

A test was also run to determine whether there were differences in the actionable scores for ideas that were generated by the design thinking and the general ideation categories. Results showed that the actionable scores for design thinking category (mean rank = 76.98) and the general ideation category (mean rank = 89.18) were not statistically different as well, U=3,042, z = -.067, p = .946. (Figure 4)
Figure 4. This chart shows that the distributions of the design thinking and the general ideation categories were not similar for the actionable variable. The unique scores for design thinking category (mean rank = 77.81) and the general category group (mean rank = 87.78) were also not statistically different, $U=3,436.500$, $z = 1.408$, $p = .159$. (Figure 5)

Figure 5. This chart shows that the distributions of the design thinking and the general ideation categories were not similar for the unique variable.
Furthermore, the test also showed that the relevant scores for design thinking category (mean rank = 81.21) and the general ideation category (mean rank = 81.99) were statistically different, $U=3,089.500$, $z = .111$, $p = .911$ (Figure 6).

![Figure 6](image)

**Figure 6.** This chart illustrates that the distribution of the design thinking and the general ideation categories were not similar for the relevant variable.

Additionally, the Mann-Whitney U test showed that the distributions for the creative scores for both categories were also not similar as assessed by visual inspection (Figure 7). However, the mean for the design thinking category (mean rank = 78.02) and the general ideation category (mean rank = 87.41) were also not statistically different, $U=3,414.500$, $z = -.1.323$, $p = .186$. (Figure 7)
Figure 7. This chart shows that the distribution of the design thinking and the general ideation categories were not similar for the creative variable.

The findings were also the same for the valuable scores for both categories.

The design thinking category (mean rank = 80.76) and the general ideation category (mean rank = 82.75) were not statistically different, $U=3,135$, $z = -0.283$, $p = 0.778$ (Figure 8)

Figure 8. This chart illustrates that the distribution of the design thinking and the general ideation categories were not similar for the valuable variable
Finally, the test also revealed that there were no statistically significant differences in the realistic idea scores for the design thinking category and the general ideation category. It showed that the mean of the design thinking category (mean rank = 80.02) and that of the general ideation category (mean rank = 84.01) were not statistically different, $U=3,210.500, z = -.564, p = .573$ (Figure 9).

![Figure 9. This chart also illustrates that the distribution of both groups was different for the realistic ideas that were generated by both categories.](image)

**Post-Session Questionnaire Results**

At the end of the focus group sessions, participants were asked to complete a questionnaire that explored whether they thought the sessions were collaborative, creative and stimulating, as well as whether they felt that their ideas mattered. The questionnaire also explored whether the participants felt that they had a voice during the sessions and whether they would want to participate in another version of their session. The results were analyzed using qualitative comparative analysis due to the limited number of respondents ($n = 33$). One participant from the design thinking
category abstained from the survey leaving n = 16 in the design thinking category and n = 17 in the general ideation category.

When asked whether their sessions were collaborative, the majority of the survey respondents indicated that they agreed at varying levels. A breakdown of their responses revealed that 68.7% of the participants that used the design thinking strategy strongly agreed that their sessions were collaborative, while 52.9% of the participants from the general ideation category gave the same response. Despite this slight variation in the levels of responses, there is no significant difference between both groups in their participants’ perceptions about whether their sessions were collaborative (Figure 10).

**Was the focus group session collaborative?**

![Chart showing participant perceptions of collaboration](chart)

Figure 10. This chart highlights participants’ perceptions of collaboration during their Ideation sessions.

When participants were asked whether their sessions were creative and stimulating, the feedback from the participants across both categories was slightly less
enthusiastic. A breakdown of responses showed that 47.05% of the participants under the general ideation category strongly agreed that their sessions were creative, while 43.75% of the participants that used the design thinking strategy gave the same response (Figure 11).

Was the focus group session creative and stimulating?

![Pie charts showing responses to the question of creativity in sessions]

**Figure 11.** This chart illustrates participants’ perceptions of the level of creativity of the format of the session in which they participated.

In response to the question that sought to uncover how the participants felt about the ideas they generated during the sessions, 68.75% participants from the design thinking category strongly agreed that their opinions mattered during their sessions, while 58.82% of those from the general ideation group gave the same response. Thus, there is also no significant difference in how the perception of the participants from both groups about how their ideas were treated (Figure 12).
Did you feel like your ideas mattered during the sessions?

![Pie charts showing participant perceptions](image)

**Figure 12.** This chart shows participants' perceptions of whether their ideas were useful to the group.

Similarly, when the participants were asked whether they felt that they had a voice during the sessions, a majority of them answered in the affirmative. However, 64.71% of participants in the general ideation category strongly agreed while 62.5% of those from the design thinking category gave the same response (Figure 13).
Did you feel like you had a voice during the sessions?

![Pie charts showing participants' perceptions of inclusiveness during ideation sessions.](image)

**Figure 13.** This chart highlights participants’ perceptions of inclusiveness during their ideation sessions.

Finally, when the participants were asked if they would participate in another ideation session that used the same ideation method, the response from both groups differed slightly. It showed that 62.5% of participants from the design thinking category strongly agreed that they would want to participate in another design thinking session, while only 35.3% of participants from the general ideation category gave the same response (Figure 14).
Would you want to participate in this type of sessions again?

**Figure 14.** This chart highlights participants’ perceptions of enthusiasm toward the ideation method they used during their focus group session.

In summary, a qualitative comparative analysis of the results showed that there was no significant difference between the perception of the participants from either category, design thinking and general ideation.

**Differences that emerged between the design thinking groups and the general ideation groups.**

A review of the focus group sessions revealed a few areas in which the two categories differ, including how they conducted their ideation sessions, how they assembled their ideas, and how they analyzed the ideas they generated.

*How participants assembled their ideas:* Observational notes from the sessions revealed that participants there was a notable difference between how participants in each category compiled ideas. While the saturate and group strategy directs
participants to generate as many ideas as possible, participants in both groups of the
general ideation category adopted an idea selection approach that led them to exclude
ideas they felt were not useful during the ideation session. For example, when
Participant 13 of the general ideation group suggested an idea:

“I think we should find a way to take out unhealthy food from the menu
systematically.”

and participant 11 retorted,

“I guess if somebody from the Dining Office were here, they would laugh very
hard at the suggestion that we should take away burger from their menu.”

The other participants laughed at the comment.

*How participants conducted their ideation sessions:* Another difference that emerged between both sessions related to their ideation styles. The design thinking
groups were instructed to use the saturate and group strategy which employs the
individual ideation approach. This technique gives participants the opportunity to write
down their ideas first and discuss them with the group afterward. On the other hand, the
general ideation groups freely adopted the strategy of giving everyone the chance to
pitch their ideas to the group and then selecting the best ideas that emerged from those
discussions.

*How they analyzed the ideas they generated:* Both ideation categories used
different idea classification techniques. The design thinking groups were instructed to
use the saturate and group strategy to help them to classify their ideas according to
thematic similarity. For example, their ideas were grouped into several categories like
make it a game, make it social, build a website or an app, make it a course requirement,
add gifts and coupons among other examples. However, without a guiding structure, the both general ideation groups classified ideas according to high-level topics. Some of the categories they established were as follows: behavior, social, supply categories. In summary, findings from the results revealed that there was no difference between both groups in terms of the quality of the ideas they created likewise in the perception of the participants on their ideation session. The next chapter discusses the implications of these findings and offers suggestions for future research.
Chapter 5: Discussion

This thesis is based on an exploratory pilot study that was designed to investigate the effects of using design thinking as an ideation tool. The research implemented focus group sessions and a questionnaire to explore this topic with 34 participants recruited for an experiment that divided them into two categories. The first category of participants was comprised of two focus groups and used the design thinking strategy saturate and group to generate ideas about a specific problem space. The second category of participants, also comprised of two focus groups, was not given a specific ideation strategy to use. Instead, they were allowed to freely implement any group ideation structure they wanted.

Findings from the study revealed that there were no significant differences between the quality of ideas that were generated by participants that used the “saturate and group” design thinking strategy and those that used no predefined ideation strategy. There was no significant difference in how the participants of either group perceived their focus group sessions. The sections that follow provide detail about three main themes that emerged from this exploratory experiment: 1) how the quantity and quality of ideas differed between sessions that used the design thinking framework and those that used the general ideation methods; 2) how the participants felt about their respective ideation sessions; and 3) the differences that emerged between the ideation sessions that used the design thinking framework and those of the general ideation group.
RQ 1: In what ways do the quality and quantity of ideas generated differ between an ideation session that uses a specific design thinking strategy versus one that does not use a predefined set of strategies to guide the process?

The outcome of the analysis revealed that participants in the design thinking category generated more ideas \((n = 102)\) than those in the general ideation category \((n = 60)\). Furthermore, design thinking sessions produced more ideas per participant \((n = 6)\) than the general ideation sessions \((n = 3.5)\). Although these results might seem to support the notion that design thinking is superior because it provides a mechanism for generating a greater number of ideas during a single session, the structure of the sessions might actually be more responsible for this outcome. As noted in the results, participants in the design thinking groups were driven by the nature of the saturate and group strategy, which encourages participants to generate as many ideas as possible before sharing ideas with the group. However, in both groups of the general ideation category, participants discussed ideas out loud as a group before settling on what they collectively believed to be the “best” ideas. Thus, it is likely this was a determining factor when it came to how many ideas were recorded by individuals and by the groups.

Concerning the quality of ideas generated from the sessions, findings from the study revealed that there was also no significant difference between groups that used design thinking and those that did not. This finding supports Jen’s (2017) claim that the ideas generated through design thinking could easily be produced through different means. The finding also bolsters Merholz’s (2009) argument that design thinking acquires its potency from the interdisciplinary group that is gathered for the ideation session and not from the process.
RQ 2: How do participants’ perceptions of the ideation processes differ between a session that uses a specific design thinking strategies versus one that does not use a predefined set of strategies to guide the process?

Results from the questionnaire revealed that participants from both sessions had very similar experiences during their ideation sessions. Thus, there were no significant differences in their perceptions of the differently structured focus groups. This finding bolsters the claims of both Jen (2017) and Walters (2011) who assert that there is no difference between the design thinking process and the standard design processes that organizations and people typically use to develop viable ideas.

The finding also revealed an interesting insight. It showed that the structured approach of idea generation, classification, and discussion techniques of the design thinking groups did not give them an experiential advantage over the groups in the general ideation category. This suggests that although the design thinking framework is often promoted as a collaborative approach to problem-solving (Lockwood, 2010), there was no significant difference in the experiences of participants from the design thinking and general ideation categories in terms of group collaboration. Thus, there are clearly different ways to successfully structure a collaborative idea generation session. Likewise, preferences about which approach idea generation a group should adopt likely depends on the nature of the problem space, needs of the organization, and personalities of the participants, as opposed to the merits of one particular ideation strategy.
RQ 3: What differences emerge between an ideation session that uses a specific design thinking strategy versus one that does not use a predefined set of strategies to guide the process?

Finally, there were also no significant differences in the quality of ideas that were generated by both ideation categories even though both groups used different ideation styles. The findings revealed an intriguing insight. They showed that when left to their own devices, participants in the general ideation category were independently able to devise a strategy that sufficiently generated good quality ideas. Furthermore, there was also no difference in the perceptions and experiences of the participants during either ideation session. This suggests that based on the findings from this study, neither ideation category had an advantage over each other. This finding implies that either method can be used to achieve the same purpose and that both methods can coexist. Just like having a toolbox that lets you choose the right sets of tools for the right task, both approaches can be used to explore problem spaces in which they are most effective and where their strengths can be applied for the benefit of the organization.

Consequently, each ideation strategy can be useful for some things and with some people. It's unlikely that any single method is all bad or all good. Instead, many variables can affect the quality and quantity of ideas that a group of people generates, including, but not limited to the strategies they use to ideate, the problem space that it explores, and the engagement of the individuals participating in the ideation exercise. Thus, the choice of which approach to use depends on the organization or the problem space.
Limitations

Several limitations affected the replication of the results outlined in this thesis. The first limitation is the limited number of participants that were recruited for the study. Because this was an exploratory pilot study, only a small number of participants were recruited. Also, most participants were recruited from the same community. Therefore, when more participants are selected from different societies and cultures that the findings from this research may differ.

The second limitation related to the methodology employed for the experiment. The focus group sessions and questionnaire may not have been the most suitable method; however, this was the choice we made at the time. Therefore, it is possible that when different research methodologies are used that the research outcomes will differ. In addition, both groups were not given the same set of instructions on how to manage their ideation sessions, also the facilitators of the ideation sessions of the general ideation groups were not informed that they should allow all the participants to generate their ideas without interruption. This disparity in the rules affected the outcomes and the flow of the focus group sessions of the participants in the general ideation category. Thus, when the same standards are applied to both categories, the findings of the research may differ. Furthermore, the disposition of the facilitators that moderated the ideation sessions may have affected the outcome of the session. The reason for this is that if one facilitator is more effective and approachable than the other, their disposition may influence the results that are generated from their sessions.
The third limitation is related to the rating of ideas that were generated during the ideation sessions. Three professionals that had relevant experience in the field were recruited to rate the ideas. Although they were given a template to guide the scoring process, it is possible that their subjective experience may have affected the points allotted to each idea. As a result, the total points awarded to the ideas may differ when another judge rates them or when another grading methodology is used.

The fourth limitation relates to the problem statement that used for the focus group sessions. We chose a problem statement that will not require the participant to have specialized knowledge before they could participate. We also considered the scope of the problem and if the challenge is deemed as a problem by the community. It is likely that different problem statements would yield different outcomes and results. This is because ideation strategies are not entirely all bad or all good. That is to say that each ideation category has an area where it shines and where it does not. Thus, it is possible that the problem statements that were chosen may have played to the strengths of the respective ideation methodologies and vice versa.

**Recommendations for Future Research**

Findings from the thesis, as well as the limitations that were uncovered during the course of the experiment reveal the need to redefine the scope of the research objectives. Thus, the recommendation for future research would be to explore areas where design thinking works best and the areas where it does not. For example, future research questions may include: 1) Are there particular topics or types of problem spaces in which design thinking is more or less effective? 2) What factors contribute to
effective design thinking sessions? 3) What kind and number of participants are most suitable for a productive design thinking session? Answering these types of questions may help us to understand better the particular problem spaces where design thinking works best likewise where it is best to consider using another innovation methodology.

Conclusion

This thesis investigated the effects of using design thinking as an ideation tool. Findings from the study did not support the hypothesis that the design thinking strategy “saturate and group” is a more effective idea generation process than an ideation session that does not use a predefined set of strategies to guide the process. The thesis also showed that there were no significant differences between the quality of ideas that were generated by the groups that used design thinking methodology and those that used the general ideation methods. Furthermore, there was also no difference in the experience and perception of the participants of both categories during their ideation sessions. Future work is needed to explore these findings to uncover more insights about the specific fields or problems space where design thinking is potent and the areas where it is not.
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# Appendix A

## Post Session Questionnaire

<table>
<thead>
<tr>
<th>Questions</th>
<th>Strongly Agree (7)</th>
<th>Agree (6)</th>
<th>Slightly Agree (5)</th>
<th>Undecided (4)</th>
<th>Strongly Disagree (1)</th>
<th>Disagree (2)</th>
<th>Slightly Disagree (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Was the session collaborative and supportive?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Was the session creative and stimulating?</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Did you feel like your ideas mattered?</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Did you feel like you had a voice during the sessions?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Would you want to participate in this type of session again?</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix B

Ideation Session Protocol

Participants: Thirty-four participants from the Ball State University community were recruited for this study.

Purpose: The purpose of this research is to investigate the effects of using design thinking as an ideation tool.

Facilitator: Obi, Ikechukwu Andrew Benedict

Location: Arts and Journalism Building Room 392

Script:

Hello everyone, thank you for coming here today. I have a script that I will be reading to you. I know this may seem formal, but it ensures that all the groups receive the same information.

The purpose of today's activity is to investigate the effects of using design thinking as an ideation tool. We want to find out the areas where design thinking succeeds as well as where it falls short. Based on what we learn, we will have a better understanding of the effects of using design thinking as a problem-solving methodology.

There are two groups of participants; general ideation group and the design thinking group. The general ideation group will be required to use no predefined innovation method to generate ideas while the design thinking group will use the saturate and group of design thinking to generate ideas for the same problem.
statement. This session will last for a maximum of one hour for the ideation session and post-session questionnaire.

For the general ideation groups, you will nominate one person to lead your session. After you have done that, the instructions and other materials will be handed over to the nominated candidate and your session can commence. Your session will last for a maximum of one hour, and remember you are required to use no predefined method to generate your ideas. At the completion of your session, we will collate all the ideas that you have generated and each of you will be required to complete a brief questionnaire that asks you to rate your perception of the session.

For the design thinking groups, before you start, you will be given an overview of design thinking Methods and processes. After that, you will be required to use different design thinking methodologies to generate ideas for the same problem statement that was given to the general ideation group. The investigator will read out the prompts and will ask you to write every new idea on a separate post-it note. This will last for a maximum of one hour, forty-five minutes. At the completion of your session, we will collate all the ideas that you have generated and each of you will be required to complete a brief questionnaire that asks you to rate your perception of the session. The total time commitment for the session and the questionnaire will not exceed two hours.

Before we continue, we need your permission. Would you please read the Informed Consent form and sign it if you agree. Please feel free to ask me about anything that is not clear. After you have read and signed the informed Consent form, we will commence the ideation sessions.
Are you ready to begin?

**For the general ideation group**

The prompt is “How might make Ball State University Students to eat healthily?”

You are free to use the whiteboard. Also, here are sharpie markers, post-it notes, pens, pencils and a pack of paper. You can use the tools in any format you desire. This session will be videotaped and will be kept in a password protected computer for a maximum of two years. The video will enable us to review the session for any insight that we may have missed during the live session. After two years, the data will be deleted/destroyed.

During the sessions, I will be taking notes but will not contribute to your sessions. Your name will not be associated with any answers/ideas that you provide. At the completion of the ideation session, each of you will be required to fill out the questionnaire below. Thank you for your participation.

**For the design thinking groups**

The prompt is “How might we make Ball State University Students to eat healthily?” Before we start, I want to give you a brief introductory lesson on design thinking methods and processes.

Design thinking can be defined as the “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” (IDEO U, 2018) According to Prasad (2017), “the focus of design thinking is firmly on the needs of the users and not on the product’s technicalities.” It gives people that use it, the creative confidence to
tackle complex problems. This “creative confidence is derived from the knowledge that the process and methodology of design thinking has been used to produce positive results numerous times” (Camacho, 2016).

Design thinking is built on three major foundations: design thinking philosophy, methods, and processes. Design thinking philosophy is the framework that guides designers on how to approach design thinking sessions. Some of the philosophy of Design Thinking includes that:

1. focus on human values. They should show empathy for the people for whom they are designing.

2. trust and adhere to the design thinking process.

3. embrace rapid experimentation and prototyping.

4. communicate their vision in an impactful and meaningful way.

5. have a positive bias towards actions and not just thinking.

6. produce a coherent vision out of messy problems. Frame it in a way to inspire others and to fuel ideation.

7. bring together innovators with varied backgrounds and viewpoints when conducting design thinking sessions.

Design thinking processes are the frameworks that are used to manage the various stages of a design thinking project. The design thinking processes include: empathize, define, ideate, prototype, and test stages.
The empathy stage is the first step of the design thinking process. This stage allows design thinkers to “observe, engage and empathize with users in order to understand their motivations and what is most important to them” (Dam & Siang, 2017, para. 3). Empathy for users could be built through empathy research or ethnography studies. This stage uses the human-centered approach that asks the question of why to gain insight about the challenges the users face (Hasso Plattner Institute of Design, 2010). At the end of this stage, designers are expected to achieve a clear understanding of the problem at hand, why that problem exists, and its adverse effect on the lives of users.

The define phase is the period of “sense making” (Hasso Plattner Institute of Design, 2010, p. 2). Here, design thinkers are expected to analyze and synthesize the problems that have been discovered so far to tackle it from a human-centered perspective (Dam & Siang 2, 2018). At this stage, they are also expected to surround themselves with visuals and user quotes from the empathy stage to help them understand and define the problem from the perspective of users rather than from their assumptions. The end product of the define stage is usually a clear, meaningful, and actionable problem statement that chronicles the challenges faced by users and should be based on the designers understanding of the people and the problem space (d.school, 2018). The define phase is important because it leads to the generation of “explicit expression of the problem the designers are striving to address” (Hasso Plattner Institute of Design, 2010, p. 3).
The ideation phase focuses on idea generation. Here, design thinkers “transition from identifying problems into exploring solutions for the users” (Hasso Plattner Institute of Design, 2010, p. 4). To innovate for the problem space, designers – often form an interdisciplinary team – to brainstorm about possible solutions for the unfulfilled needs of users. Using an interdisciplinary team for the ideation session helps ensure that there are a variety of ideas and diversity of perspectives. At this stage, it is often recommended that ideas be generated before being evaluated or criticized. This approach enables the team to come up with as many ideas as is possible and also to ensures that all members of the team are free to contribute ideas without being criticized. In summary, this is the phase in design thinking that is dedicated to user-centered innovation.

The prototyping stage involves “producing inexpensive, scaled down versions of the product or specific features found within the product so that they can investigate the problem solutions generated in the previous stage” (Dam & Siang, 2017, para. 8). The prototyping stage typically involves three steps: low-fidelity prototyping, which typically involves paper sketches of the proposed ideas; medium-fidelity prototyping, which typically involves a barely functional design of the proposed solution; and high-fidelity prototyping, which usually involves a complete but not yet deployed end-product. This stage allows designers to test and refine their ideas based on the feedback they get from users. It also gives designers a chance to fail without consequences. Each iteration of prototypes should incorporate feedback generated from the previous testing with users.
Finally, the test stage is a “chance for design thinkers to get feedback about their solutions or refined solutions to make improvements” (d.school, 2018, p. 5). At this stage, “designers must return to users for feedback and ask them whether the solution meets their needs” (Gibbons, 2016, para. 17). The d.school recommends that as a “rule of thumb: always prototype as if you know you are right, but test as if you know you are wrong—testing is the chance to refine your solutions and make them better” (Hasso Plattner Institute of Design, 2010, p. 6).

Design thinking methods are the techniques used by design thinkers to execute a design thinking project. There are several design thinking methods but we will only explain the three methods for this session. The first method is saturate and group. This methodology helps design thinkers “to unpack thoughts and experiences into tangible and visual pieces of information to draw inspiration from them” this can be achieved using post-it notes or whiteboard. The second method is Point-of-View Analogy “A point-of-view (POV) is your reframing of a design challenge into an actionable problem statement that will launch you into generative ideation.” An example of this is the description of “Personal music player as jewelry,” this metaphor lead to the creation of the iPod. Thus, “looking at the headset as jewelry, rather than simply speakers, allows the designer to create a product that users will enjoy as a projection of themselves, rather than merely a utilitarian device.” The third method is the Journey map. Using a journey map is “an excellent way to systematically think about the steps or milestones of a process” that users go through to encounter a problem. With this, the designers will
discover and make interventions where necessary. Here, every step of the process is important as insights can be acquired even in the most mundane task(s).

Now, you will be required to use only one of the above listed design thinking methodology to innovate for the problem space. Here are sharpie markers, post-it notes, pens, pencils. You will need them for the sessions. I will read out the prompts and will facilitate each of the sessions. This session will be videotaped and will be kept in a password protected computer for a period of two years. The video will enable us to review the session for any insight that we may have missed during the live session. After two years, the data will be deleted/destroyed.

During the session, you will be required to write each new idea on a separate post-it note. At the end of the session we will group all the similar ideas together and discuss them briefly. I will be taking notes during the sessions. Please note that your name will not be associated with the answers/ideas that you provide. At the completion of the ideation session, each of you will be required to fill out the post-session questionnaire. Thank you for your participation.