

Quintessential Design:

Impact on inspiration and potential for radical innovation

Abstract

Author(s)	Publication type	Completion year
Beatriz de Moura Figueiredo	Thesis, UAS	2025
	Number of pages	
	40	
Title of the thesis		
Quintessential Design: Impact on inspiration and potential for radical innovation		
Degree, Field of Study		
Packaging and Branding Design		
Abstract		
<p>Quintessential products, which are widely recognized as the definitive examples of their category, are embedded in everyday life, yet their influence on product design ideation remains largely unexplored. This study investigates how such forms shape inspiration in the creative process and whether their impact is beneficial, detrimental, or neutral. Through a multi-modal case study with design students working on product development briefs, the research captures both self-reported and observed data to reveal patterns in creative decision-making. The findings reveal that, although quintessence is not particularly perceived as highly inspirational, there is an opportunity to employ it as purposeful stimuli for overcoming creative challenges. Notably, when a negative impact emerged in the form of design fixation, employing a radical ideation method, specifically role-storming, proved highly effective in helping participants overcome this obstacle. This research offers insights into the design inspiration and education literature, offering new perspectives on the cognitive processes relating to collaborative innovation.</p>		
Keywords		
Product design process, inspiration, quintessence, cognitive science		

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1 Introduction

A defining characteristic of human progress is the development of tools and how their shape is continuously improved upon in order to perfect its function (Johnson, 1953, 5–6). As a product's form is iterated through time, many variations may appear as competing manufacturers aim to distinguish themselves.

On occasion, a prevalent form might appear that stands out among all variations and becomes in a symbol for its category of product (Brewer, 2021). In this case, the form might be referred as the quintessential shape of that specific product. As Cornfield and Edwards (1983) explain, quintessential objects, such as the Mont Blanc Diplomat pen and the Levi's 501 jeans, are precisely what they should be, unmistakably right (Belk et al., 1989, 16).

The phenomenon of quintessence in product design can be better understood through the lens of cognitive science. Cognitive science is a field which studies, through interdisciplinarity, the mind and intelligence (Thagard, 2023). Some of the relevant concepts that pertain to quintessence are mental models, affordances, design fixation and change aversion.

Radical innovation is the advent of creating products or services which are completely new. It is different from "traditional" innovation, which can be described as incremental, because it seeks the ultimate version of that product or service, while incremental innovation develops it step-by-step. So, radical innovation may allow designers to surpass stagnation, when the form in question appears to be unable of improvement through the incremental approach. Ideation methods in radical innovation differ from incremental innovation due to their focus on disrupting norms, challenging assumptions, openness to risk-taking and reframing problems. (Norman & Verganti 2014, 78-79.)

In this thesis, the goal is to explore the relationships of quintessence, product design and radical innovation's ideation methods. Existing products influence, even if subconsciously, creativity. In some cases, existing products might even cause fixation during product design efforts (Agogué and Cassotti, 2013, 2).

Therefore, it is possible to assume that quintessential products may negatively impact design efforts by causing even more fixation due to their cultural significance and prevalence. In which case, radical ideation methods might be employed as a strategy for dealing with such issue.

However, quintessence could potentially benefit the design process if used as a good example to follow in terms of usability and feasibility. To explore the potential effects and uses

of quintessence, a main research question, followed by two subsequent questions, were formulated:

1. Is there a discernible effect of quintessential forms in the students' process?
 - a. If so, is that effect positive, negative or neutral?
 - b. Do radical innovation methods alter the effect of quintessence?

Case study

A group of design students (N=5) was hired to conduct three parallel product development projects where the briefs were provided by three client companies. This paper is a case study on their creative processes throughout the duration of all projects. The sampling method was purposive convenience sampling.

The students worked in groups. Two students were part more than one project, hence their participation in two different groups simultaneously. Although the projects were conducted in parallel, they each had their own briefs and timelines according to its client's needs.

The three schedules were analysed, and the research schedule was built based on which stages of the creative process the experiments would better be suited for. This case study utilized a multi-modal approach for data collection.

The intention was to obtain a holistic understanding of the participants' creative processes and the factors which influenced them. The combination of self-reported data, observational and researcher-facilitated methods allowed for cross-validation and deeper insight. Through this diversity in data collection methods, both explicit and implicit aspects were contemplated in the analysis.

2 Cognitive science and design

2.1 Mental models

A mental model is a theory within cognitive science which seeks to establish a framework for how people represent and use knowledge, concerning introspection and explanation (Johnson-Laird 2006, 27-51). It proposes an internal mechanism that the human mind uses to represent information and operate based on it (Johnson-Laird, 1983, 2-4).

Designers are mainly engaged in projects where the user of the solution will be someone other than themselves. This is one of the core aspects of user-centered design. Therefore, designers are constantly considering the which mental models the users might be required to employ when interacting with the problem and its solution.

Some solutions might challenge the existing models or require a reframing to be applied. When that happens, for the user to adjust their own model, new information might be required and made accessible. An example of offering the required new information is a “What’s New” screen that an online application might display when a user opens it for the first time after a system update.

A misunderstanding from the designer’s side of the user’s model or, alternatively, failure to provide the necessary information might cause a solution which isn’t relevant and fails to fulfil its goal. Radical innovation often seeks to disrupt and challenge norms, which is why mental models are essential to the practice of design and must be considered during radical innovation. Quintessential products, in turn, excel at either conforming to the existing expectations or at facilitating the adoption of a new mental model without overdue effort.

2.2 Affordances

Gibson (1966) describes affordances as cues perceived by the mind from its environment, which present opportunity for interaction (Brakus, 2008, 145, 150). Considering the previous concept of mental models, affordance might be thought of as a suggestion that can trigger a specific model. To illustrate, a button affords, or suggests, to be pushed and this, in turn, triggers the model that pushing a button causes a result, for example, a button which, when pressed, turns on a lightbulb.

A key characteristic of affordances is that they can be perceived in two stages. Firstly, a pre-conscious stage, where they affordance is perceived directly based on responses shaped by evolution. Secondly, a conscious-reasoning stage where the mind infers conclusions from the affordances which are more complex. (Brakus, 2008, 150–52.)

When considering design practice in relation to affordances, two complications exist which are pertinent to radical innovation. The issue might arise from the gap of “perceptible affordances” and “hidden affordances”, which occur when a feature is not apparent enough to prompt use. The second complication derives from the consequence of acting on an affordance, which fails to reach the desired expectation, creating a “false opportunity” or even a “false hazard”. (Flach et al. 2017, 78–86.) So, it is imperative for designers to strive to eliminate any affordances that might generate a hazardous consequence and to make the desired affordances clear and corresponding to their result.

2.3 Design fixation

Fixation, when referring to design, is the phenomenon that describes an inability, often subconscious, to diverge from previous solutions or examples when in the creative process. It inhibits the designers to move beyond the creative block that stems from the knowledge of a familiar approach or solution. (Jansson & Smith, 1991, 4.)

Mental models and fixation are related because a strong mental model may hinder divergent thinking, as more cognitive effort is required to stray away from a persistent form reinforced by the model in question. Considering that radical innovation looks for completely new solutions, design fixation can be one of the most significant barriers the designer might face.

Strategies to overcome fixation have been objective of many researchers, as far back as the Gestalt movement, when the concept of insight emerged as a way reach a solution through abruptly re-framing a problem (Condoor & LaVoie, 2007, 1). Currently, the Design-by-Analogy (DbA) method has become very relevant as it proposes several approaches and methods for de-fixation and achieve insight (Moreno et al., 2015, 3–8).

2.4 Resistance to change

Changes can be very controversial, as they frequently present, to some degree, a risk. Avoiding risks is highly influential in the process of decision-making (Lilleholt, 2019, 234). This can be further understood via the concept of loss aversion, where humans tend to perceive loss as more significant than a gain of the same value (Zhao et al., 2020, 1–2). So, because losses are attributed a higher weight, they are more likely to be avoided and, thus, changes are resisted due to their opportunity for loss.

This can be noticed in changes seemingly trivial as a logo redesign but that spark strong negative reactions. For example, in 2010, the clothing retailer Gap Inc. revealed a redesign of its logo. The public response, however, was so vehemently opposed to the new version,

that the company reverted back to the original logo one week after the announcement (Geoghegan, 2010).

Noteworthy, the situation above illustrates that the resistance to change which new design proposals may face aren't always solely due to the cognitive instinct of preferring the familiar. Lack of touch with consumer preferences and needs are just as detrimental to the acceptance of innovation. Therefore, engaging with the stakeholders during the innovation process, be it by direct participation or indirect contribution, is of the utmost importance.

2.5 Inspiration, insight, and its effect on cognition

Inspiration plays a complex role in the practice of design. As Baigelenov et al. (2025, 3) explain, some studies have shown that using inspiration may enhance idea generation and creativity, while others have found that it can deter original solutions. Designers, therefore, must be tactful in utilizing it appropriately in a manner that benefits them while aware of the potential for fixation.

One way in which searching for inspiration may be useful is, for example, in benchmarking how other designers have dealt with challenges such as highlighting affordances or bridging gaps created by dissonance in mental models. Learning from successful solutions can be a powerful tool when analysed and re-contextualized into a new context, and ultimately, to generate insight. Mayer (1992) described insight as the shift from not knowing the solution of a problem to knowing it's solution (Oleynick et al., 2014, 4).

Insight is often linked to inspiration, as inspiration can be understood as a likely response to insight (Oleynick et al., 2014, 4). Additionally, inspiration consists of two separate processes, being inspired "by" and inspired "to" (Thrash and Elliot 2004, 969–971). This denotes that first there is a passive state of appreciation which is then followed by an active state of motivation to act on that feeling.

So, in the practice of design, professionals search for insight through a variety of means in hope to trigger inspiration. Although one of the most common one method for this is benchmarking, designers can derive inspiration from many different sources such as nature, media and art. However, the existing literature lacks comprehensive understanding of the use of quintessential products as a source of inspiration for design professionals.

3 Quintessential forms

3.1 Pillars of quintessence

The factors that lead to a certain product becoming quintessential are many, and the circumstances of that make one design more prevalent than a contemporary alternative are complex and vary depending on the context. However, there are a few attributes that are almost always present when talking about a classic design. These attributes are reliability, scalability, efficiency, culture permeation and intellectual property protection (Mauriello, 2024).

3.1.1 Reliability

The Bic pen embodies many of the hallmarks of a quintessential design. Its form is purposeful and functional, it is affordable, and it has achieved iconic status in a cultural point of view (Thackray, n.d.). This is evidenced by the fact that, having been released in 1950, by 2005, 57 pens were sold per second (Henley, 2005).

It is a staple of everyday life largely due to its quality and reliability (Kieron, 2021). A Bic pen may write up to 3 kilometres, showcasing how long-lasting it is ("BIC Cristal Anniversary," 2020). This is the most basic and fundamental attribute of a quintessential design as it must, first and foremost, fulfil its desired function dependably.

3.1.2 Scalability

The Gem Paperclip was designed in 1890 and is, to this day, the most common design of a paperclip. It is so dominant, that other alternatives, such as the Owl paperclip, the Ideal Paperclip, and the Clipiola are unfamiliar to most. (Weller, 2015.)

This form uses the least amount of wire, making it cost effective and executes its task well featuring only three turns in its design. This allows for great potential in scaling up manufacturing and is partially why this type of paperclips has succeeded thus far. By 2011, an estimated 20 billion paperclips were produced per year in the United States alone (Emery, 2012).

3.1.3 Efficiency

In connection with reliability and scalability, efficiency plays a significant role in making it viable for a product to become widespread and popularized. Ford's Model T not only combined reliability and scalability but, by assuming control of its entire production process,

Henry Ford was able to drive efficiency in every step of the product's lifecycle (Gelderman, 2025). The result was an automobile that made affordable to the masses for the first time and ultimately revolutionized transportation at a nation-wide scale.

The mass production method implemented by Ford had a lasting influence on both product design and production. By removing anything apart from the basic essential elements in the Model T, he was able to reduce the cost of manufacturing, and consequently the price of the car, and to maximize the capabilities of Ford's factories.

3.1.4 Culture permeation

Another attribute distinctive of quintessential products is their ability to break into the cultural collective consciousness and establish itself. Two products that clearly exemplify this phenomenon are the PlayStation DualShock controller and the iPhone (Mauriello, 2024). Before their release, their respective categories were plentiful with diverse forms, such as Sega SG1000 controller or the flip phone, in the category of mobile devices.

However, after their respective launches, both the DualShock controller and the iPhone became ubiquitous of their own category and set a new standard. Since the controller's release, other video game companies have made their own versions but following to a great extent the new blueprint set by PlayStation (Gartenberg, 2019). Likewise, the iPhone became a new standard for smartphones and, since its release, competitors aim to surpass Apple but don't stray far from the form popularized by the iPhone (Boyo, 2024).

3.1.5 Intellectual property protection

Intellectual property must not be overlooked by designers, as its protection can be a key strategy in reaching quintessence. This can be observed by the success of the LEGO company. Founded in 1932, it obtained its first patent in 1958 (Ockenden & Watts, 2025).

Patents, however, expire in 20 years since their registry and may not be extended. This meant that the company had to seek other ways to protect its innovations. Since then, LEGO has systematically used trademarks to protect key brand assets and copyrights to protect creative design of construction kits, Minifigures and more. (Menkhorst, 2024.)

Through trademark protecting, LEGO has prevented the brand name of being used as a generic name for toy bricks, which has been the case for brands in many other categories such as Band-Aid as a synonym for adhesive plaster. Given the nature of LEGO's simple but innovative products, counterfeit copies could have posed a major threat but, through intellectual property protection, the company has successfully established its uniqueness.

3.2 Design plateaus

An effect that quintessential products may have on design is a stagnation in the development of better alternatives. By becoming the typical form which most users are used to, it can be difficult for designers to progress beyond it.

Of course, other reasons might impact these design plateaus, such as material and technical constraints. But, ultimately, for something to replace the standard, it requires effort on the user's side to learn the new form.

For this effort to be justified, the improvement must be sizeable enough to make the user feel that it is worth it. Hence, the creative development of product design might be better understood not as a linear graph where the x-axis represents time and the y-axis the progress, but rather, as a graph where the development increases, remains levelled and suddenly climbs up (Figure 1).

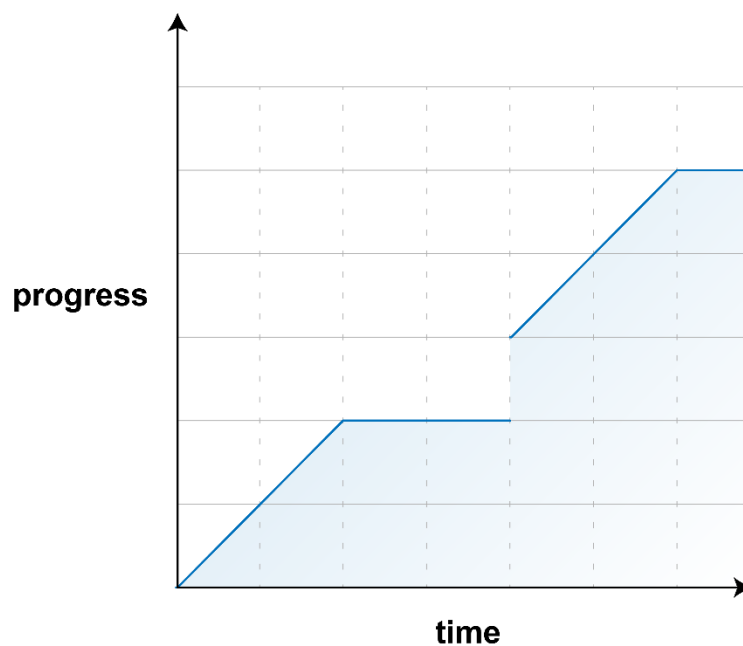


Figure 1. Visualization of design plateaus. (Image: Beatriz de Moura Figueiredo)

It is worth noting that, while the overall development of a product may be understood as above, the design process itself, which leads to the creation of an improvement, is often non-linear, with iteration loops and with divergent and convergent stages. (Murtell, 2025.)

4 Methods

4.1 Questionnaires

The following five methods were used to collect data from the participants' process. Each method contributed a distinct perspective to the research questions: some sought to capture the decision-making moments and logic behind design decisions, while others focused on attitudes towards inspiration and creative strategies.

Two questionnaires, one at the beginning and another at the middle, were held. Each questionnaire has different objectives, catered to the relevant aspects of the stage where they were sent out. The first questionnaire aimed to capture the initial thoughts, assumptions and predictions that the students have formed about their upcoming project, brief and group work, as well as collect their self-reported view of their personal creative process.

The second questionnaire followed up on the progress of the projects up to the midpoint as well as diving deeper into certain topics, which sparked most insights based on: the analysis of the first questionnaire, the researcher's own observations, and some of the ongoing experiments, for example, the Inspiration Log.

There are three sections in the second questionnaire, each with a different focus and objective. The sections are the following:

- Finding inspiration

The goal is to confirm whether the participants' approaches to seeking inspiration are as varied as they have appeared (some seem to avoid it while others rely greatly on it) and how they are utilizing the inspiration they find (passive versus active inspiration).

- Dealing with creative blocks

In this section, the objective is to explore the link noticed between fixation and inspiration, as some students reported fixation caused by inspiration, when others use external inspiration as a tool for dealing with fixation.

- Following up on the team's creative process

Finally, the third section aims to track if the participant's perspective of their own team's creative approach has shifted since the beginning of the project.

The second questionnaire was mostly composed of multiple-choice questions by design, to focus on certain themes and more easily compare the answers between participants. Most of the questions also leveraged first-person phrasing in order to facilitate introspection and

encourage reflection on concrete behaviour, instead of projecting future or idealistic behaviour (Anderson, 2020).

4.2 Observation

The researcher was present during group work sessions, including moments of desktop research and group feedback, for example. Field notes were written on structured observation sheets. The aim is to comprehend more clearly the students' journey, particularly non-planned interactions, where insights might occur.

An example that illustrates why this observation was important is one session where a participant spontaneously shared with the other participants a tool for transforming sketches into 3D renders powered by AI. This provoked a pause of their individual activities for an unplanned exploration session where they tested different prompts and exchanged ideas.

If such a moment would have been missed, the nature of this creative process might have been less accurately analysed. It is important to note, however, that this method is meant to complement the understanding of the overall process and enrich the analysis, rather than being a self-contained method.

4.3 Inspiration log

This experiment was a form diary study, where each student participated two times a day for five days, in a signal-based approach, via prompts by text message. Studies have shown that inspirations may produce fixation during ideation (Eftekhari et al., 2021, 181), so this experiment provided daily themes for inspiration in order to observe if there is fixation and whether or not it varies depending on the nature of the theme. Two themes were related to quintessential attributes, while other two were related to disruptive attributes, and the last theme was chosen by the student.

The questions this experiment sought to answer are:

1. Does the inspiration impact the students' daily ideation activities?
2. Is there a difference between the impact of the quintessential themes versus the disruptive themes?
3. When given the choice to pick their inspiration, do the chosen themes align more with quintessential or disruptive attributes?

The structure of the prompts is that, at the beginning of each day, the student receives a message with the daily theme and is asked to find an image of their choice which relates to

the theme and send it to the researcher. At the end of that day, the student is asked to reflect on how their ideation was and if they felt influenced by the theme.

4.4 Design out loud

This experiment was based on the Think Aloud protocol as described by Fonteyn et al. (1993). This method of study can offer valuable verbal insight about the logic behind solving a task (Fonteyn et al., 1993, 430–433).

Participants were asked to externalize their thought process while conducting ideation tasks. The sessions were conducted individually, and the audio was recorded and, later, transcribed.

There was a short practice round, followed by two twenty-minute rounds. In each round, participants received a printed A3 sketching sheet with the written instructions as seen in Figure 2.

ROUND 1	Sketching Area	
Page number:		
<p>On the left side, draw a typical video game controller. Next, draw on the right side what a future video game controller might look like. Think what could be improved and how the technology might evolve.</p> <p>Make as many sketches as you like.</p>		
time: 20 minutes		

Figure 2. Design Out Loud, Sketching Sheet - round one.

During the first round, participants were asked to draw a typical video game controller and then, next to it, draw what a future video game controller might look like. They were instructed to think about what could be improved and how the technology might evolve.

On the second round, participants were asked to use a Role-storming method. This ideation method is linked to radical innovation given that, by encouraging participants to assume a different point of view, it promotes re-framing of the problem and openness to new perspectives, which are the defining features of radical innovation methods (Norman and Verganti, 2014, 82).

The instructions of the second round asked participants to imagine they were no longer themselves, but rather an octopus. They were given a short description of an octopus' appearance and abilities. They were then asked to design a video game controller that would be ideal for them while in the role of an octopus.

A video game controller was the chosen object for a variety of reasons. Most importantly, there is a clear quintessential controller, the PlayStation DualShock (Gartenberg, 2019). Another important reason was that the students would be likely familiar with this object and have probably interacted with at least once before.

The questions this experiment aims to answer are:

1. Is the assumed quintessential form portrayed?
2. Is fixation present?
3. Does the radical method affect the outcome?

4.5 Semi-structured interview

This data collection step was originally planned to take place as a final questionnaire with similar questions to the midway questionnaire as well as more open-ended questions as it sought to provide a space for participants to reflect and freely comment, as well as signalling the end of the research process (Sowicz et al., 2019, 2).

The intent was to have three comparable instances of the questionnaires, so that the middle and final questionnaires would follow-up on the first questionnaire's topics and track any changes to the answers.

However, the second questionnaire provided the desired insight from the follow-up and there was a shift in the students' process. Their tasks became more executional, participants were no longer actively ideating, but rather executing the concepts selected. So, the creative approach was not likely to suffer changes.

Therefore, going forward with the third questionnaire as planned would likely not generate any new information. So, this data collection step was modified to a semi-structured interview with each participant, in the hopes of getting richer data. According to Bearman (2019,

3–4), effective semi-structured interview questions generate thick description, which Schultze and Avital (2011, 2–3) describe as a form of description that presents human behaviour taking the actors' intentionality additionally to the physical and social, making their meaning and significance accessible.

To conduct the interviews, firstly an interview guide was prepared. It contained general questions and core questions. The core questions pertained to the participants' reflection about the process and its different stages, as well as the participants' satisfaction with the outcomes produced.

The interview guide also included planned follow-up questions, while leaving possibility for unplanned follow-up questions. The interviews were scheduled to each participant's best convenience, and the audio was recorded and, later, transcribed.

5 Findings

5.1 Opening questionnaire

The answers of the opening questionnaire were analysed using Braun and Clarke's Thematic Analysis approach. The relevant data units were identified and coded. The codes were arranged into themes. The themes were then reviewed, refined, and, lastly, written into a narrative of the data. (Braun and Clarke 2006, 15–23.)

The Table 1 shows an example of a coded segment of text and, next to it, the codes associated with each highlighted unit. Figure 3 shows a sunburst graph of the codes and themes, while Figure 4 shows the code tree branches and their connections.

Table 1. Coded segment of text.

Data extract	Descriptive codes
Units of data (in-vivo codes highlighted)	Line by line coding
<p>I <u>look up pictures/music/information</u> (varies quite a lot and I usually pick ones that <u>first come to mind</u> while working on the project, and <u>they might not have anything to</u> <u>do</u> with whatever I'm doing) and "<u>chew</u>" on them. <u>I analyze them</u> and <u>reduce it</u> to it's components. <u>What excites me about it?</u> <u>What do I like about it? What do I hate</u> <u>about it? Why is it like this?</u></p>	inspiration seeking, source of inspiration
	intuitive approach
	openness
	introspect
	examine
	personal preference / intuition

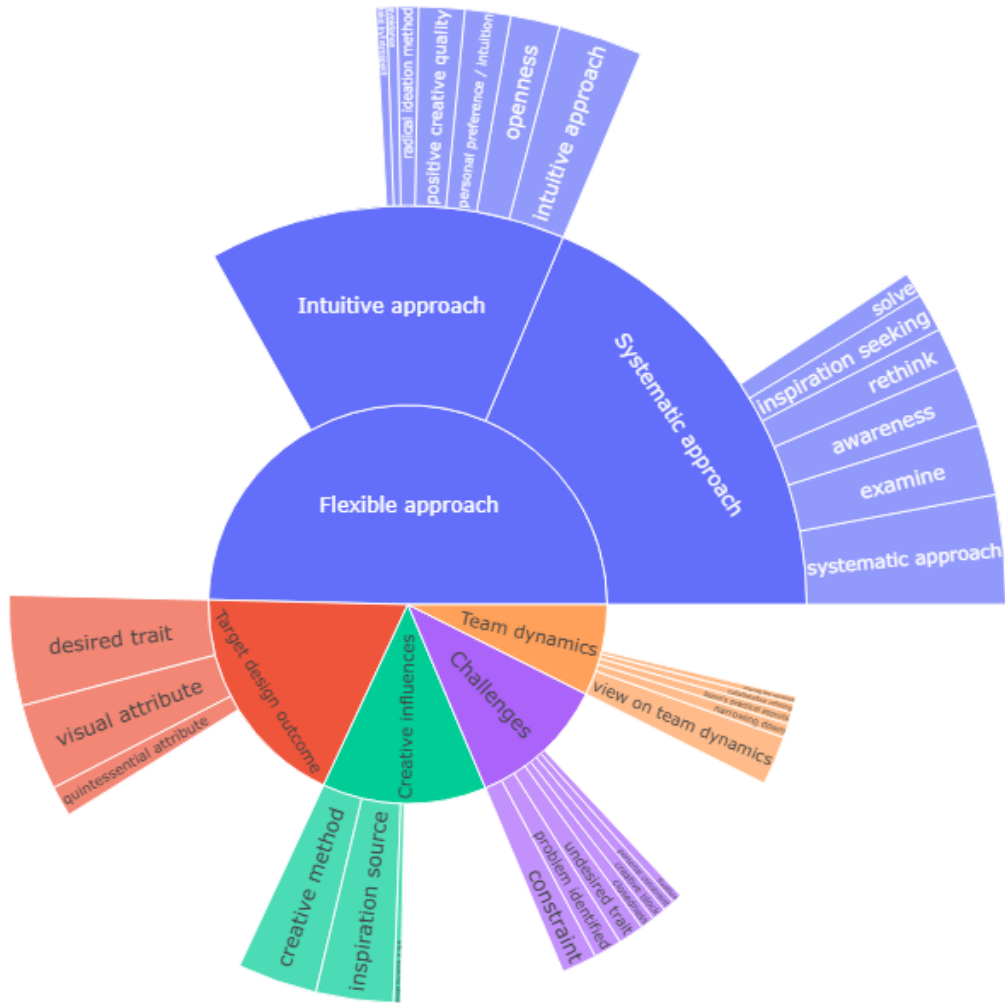


Figure 3. Sunburst chart of codes and their themes.

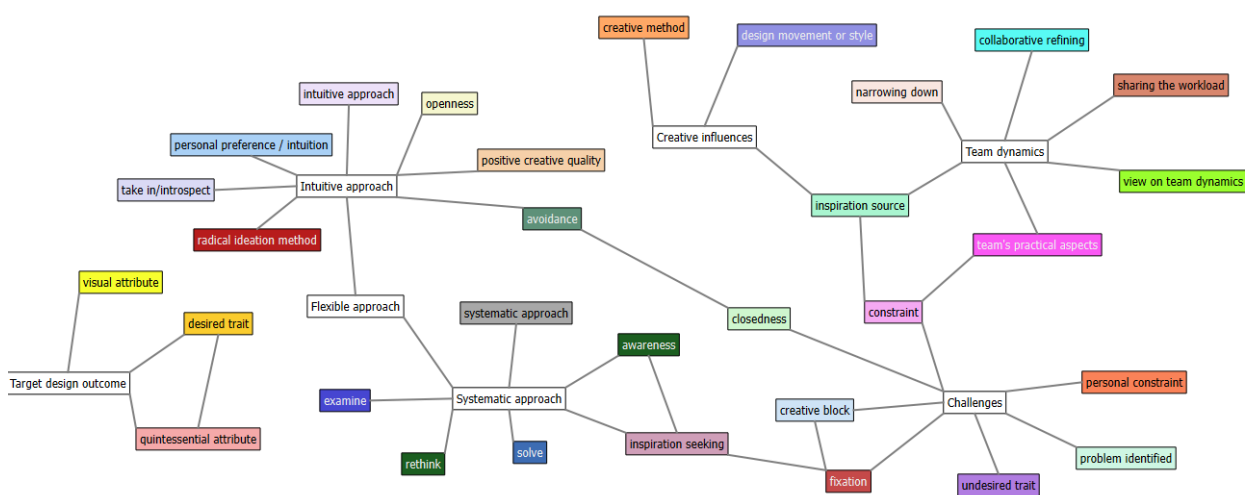


Figure 4. Chart of code tree branches.

This questionnaire provided valuable insights, particularly into the students' view of their personal creative process. Creative researchers suggest the individual unconscious preference between one of two distinct cognitive styles, intuitive and systematic. Systematic thinkers are thought to be more analytical and structured, while intuitive thinkers are supposedly more instinctive and emotional (Sagiv et al., 2014, 403–405). Historically, design as a profession has been closely associated with artistic and intuitive personalities. Studies have shown a bias in how designers describe themselves as more intuitive in response to the cultural perception of intuitive style being more creative (Tan et al., 2024, 11–12).

The students' description of their personal process gravitated towards intuitive traits.

My creative process is a mess and mostly free-form. (Participant A)

However, when giving practical examples, they cited many creative strategies and methods which point to a systematic and structured approach. These methods included examining the subject area, rethinking the brief and searching for inspiration. Radical ideation methods and personal intuition also played a present role, which indicates that the personal process is highly flexible, combining both intuitive and systematic characteristics.

This conclusion is supported by Sowden et al. (2019), which suggests that any person, independent of the assumed cognitive processing style, in order to engage in creative thought, switches between intuitive and analytical thinking in relation to what the circumstances ask for (Sowden et al., 2019, 8–10).

There are, notably, variations depending on each student, given that some prefer to do substantial research before starting any ideation, while others consciously avoid it.

I generally avoid looking directly at similar products for inspiration, because it strongly influences my own work. I feel that excessive benchmarking constrains my creativity, as it causes me to shut out things I've seen elsewhere. (Participant E)

This avoidance may be because of their reported belief that seeking inspiration hinders the quality of creativity, producing more fixation and creative blocks. However, when asked about their goals for the design solution, quintessential attributes were frequently co-occurring with desired traits, along with visual attributes.

A source of inspiration that wasn't avoided and instead sought out is the interaction and dynamics with the team. Giving and receiving feedback were cited as tools for surpassing fixation. Having said that, the team's effect on creativity was shown to be multifaceted, as it

was reported to provoke a more systematic process, with benefits such as sharing the workload, as well as hindrances, being often linked with scheduling constraints and communication challenges.

5.2 Inspiration log

This experiment took place shortly after the first questionnaire. After the experiment, the images returned by the participants were compiled as well as the text replies. The content of the images was analysed, and the text replies were coded. The number of participants was four during this experiment, as one participant was not available to participate.

When prompted with implicit quintessential attributes, for example iconic, pictures of quintessential products were only received twice out of eight times. This could mean that quintessential products do not occupy a significant mind share when connected to inspiration, in other words, they might not be perceived as inspirational.



Figure 5. Inspiration log entry from one participant for day 1 - iconic. (Moccamaster Automatic)



Figure 6. Inspiration log entry for day 5 - chosen word: unnecessary (Image: Katerina Kamprani)

A significant impact of the inspiration themes was not consistent nor was there a significant difference between quintessential versus disruptive themes, as seen on Table 2. All the students chose a disruptive theme on the day of free choice. This indicates that disruptive themes may be preferred and perceived as more inspiring.

Table 2. Influence of daily themes

Has the theme influenced your ideation today?		Day 1 iconic (Q)	Day 2 weird in a good way (D)	Day 3 timeless (Q)	Day 4 unexpected (D)	Day 5 free choice (D)
	yes	2	3	1	2	2
no	2	1	3	2	2	

5.3 Design out loud

Subsequently to the Inspiration Log experiment, the Design Out Loud experiment was carried out. The verbal data, meaning the transcriptions from the audio recording of each session, was coded and analysed. The visual data, meaning the sketches produced during the sessions, were photographed, coded and analysed. Each sketch was then placed in a matrix which assessed the innovation factor in two dimensions: form and function (Figure 7). In Figure 7, pink dots represent codes from the first half of the round one, while purple dots represent the second half of the round, and blue dots represent codes from round two.

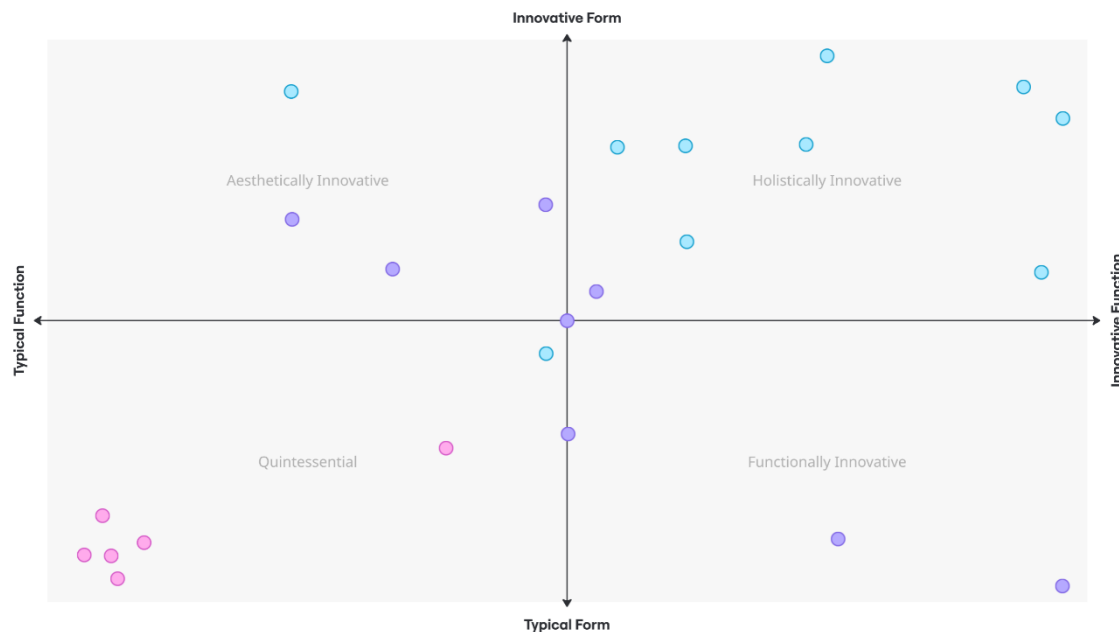


Figure 7. Two-Dimensional Innovation Matrix Assessment.

During the first round of the experiment, every participant mentioned visually and explicitly verbally the PlayStation DualShock controller as being the typical one, confirming the experiment question one (Is the assumed quintessential form portrayed?). Participants also reported experiencing fixation (experiment question two) particularly during the second part of round one, when they were asked to think of a future controller.

I got so stuck thinking about the typical ones, but when I started thinking about something else, it got so crazy. (Participant B)

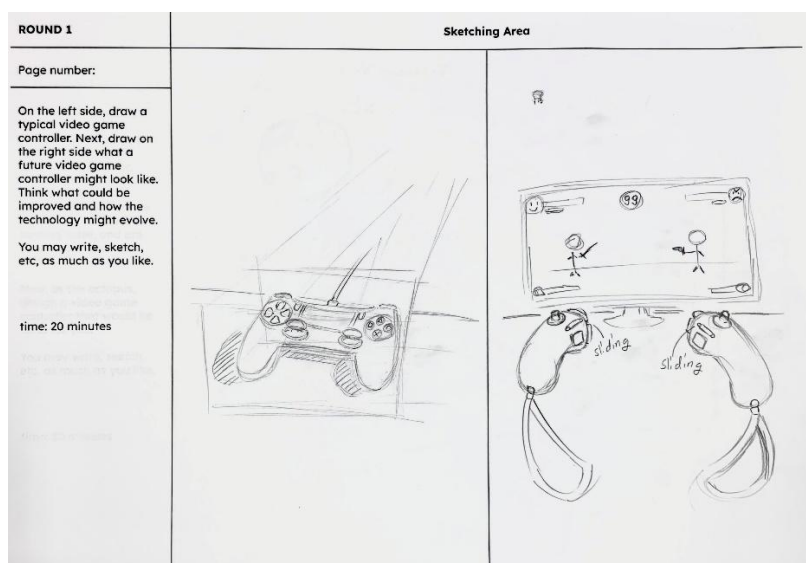


Figure 8. Sketches from a participant during round one.

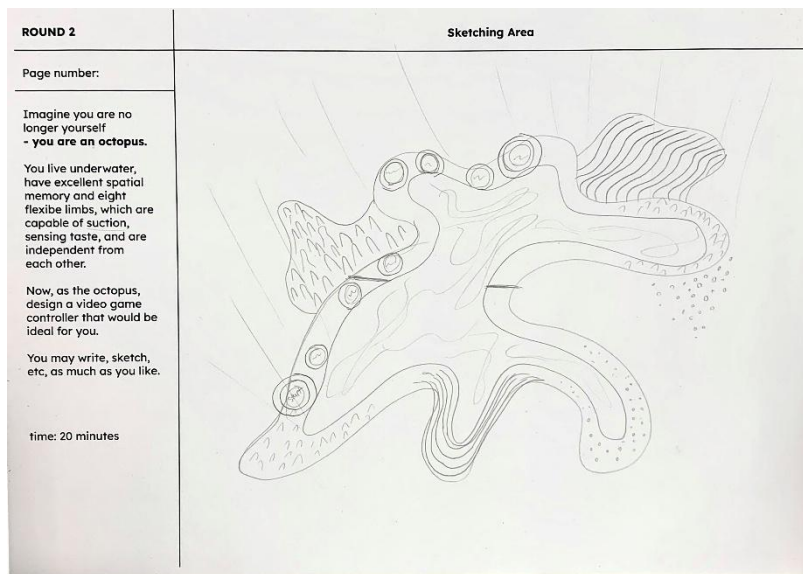


Figure 9. Sketch from a participant during round two.

Fixation could also be observed in the visual data, as the ideas for the future controller would often showcase an aspect of innovation either in its form or function, but rarely in both dimensions (Figure 7). This potentially points to fixation impairing the ability to think holistically about the innovation, and participants choosing, instead, one attribute to focus and improve on.

During round two, participants showed a higher degree of creativity both in their approach for the visual appearance of the controller as well as in their ideas for the mechanisms and functions (Figure 10). The instructions of the exercise mentioned taste as one of the abilities of an octopus, but many participants went beyond and explored how to integrate almost all senses. This could indicate that the use of the Role-storming method facilitated thinking more holistically about the solution, mitigating fixation, and, ultimately, achieving innovation that is more radical, rather than incremental.

“If you download a new game, then when you put these controllers to the main dock, it could download some different sensations to these controllers, like there are some tastes or actual feelings of pain or something.” (Participant E)

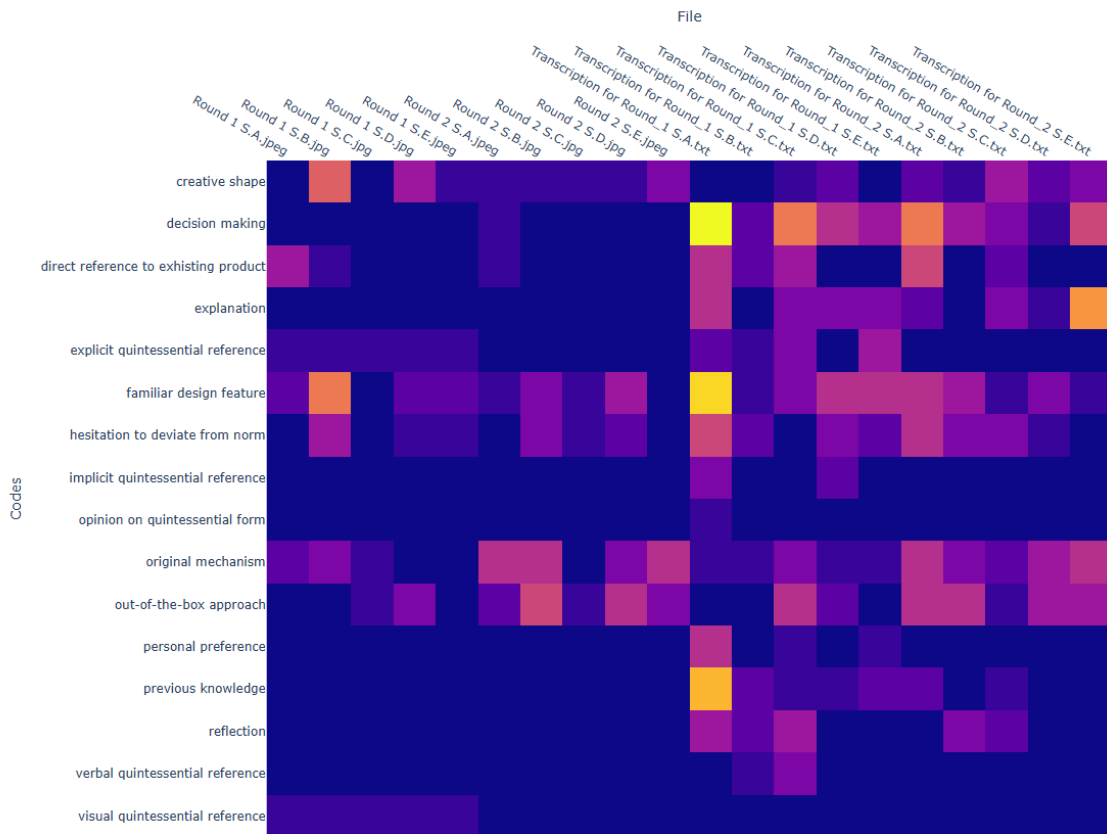


Figure 10. Codes Heatmap chart.

5.4 Midway questionnaire

The multiple-choice answers of this questionnaire were visualised in graphs to aid analysis (Figure 11). The open-ended answers were analysed using Braun and Clarke’s Thematic Analysis approach (Figure 12).

I find most inspiring to me...
5 responses

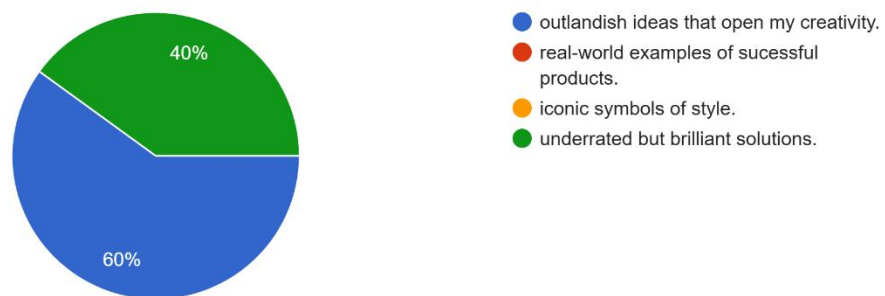


Figure 11. Question 3 of the Midway Questionnaire

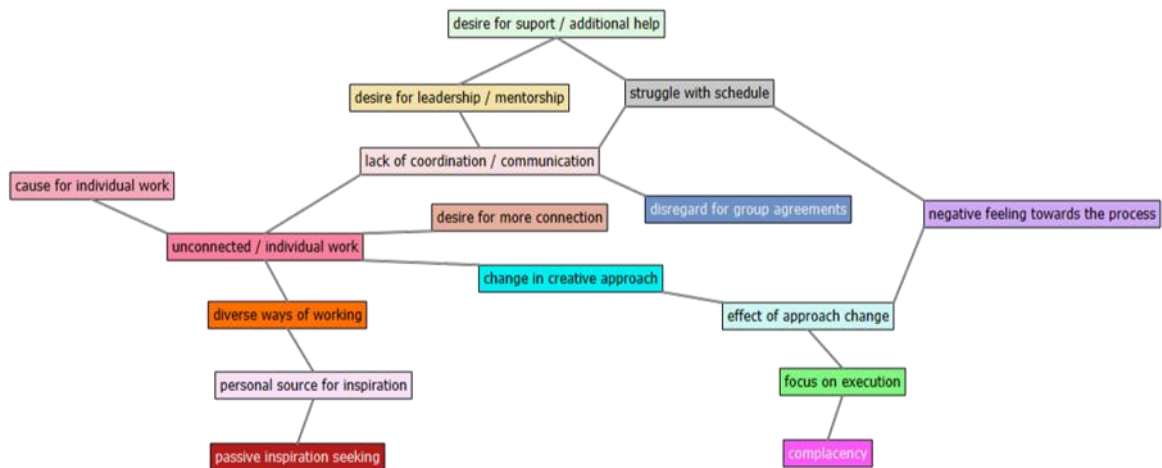


Figure 12. Chart of code tree branches of the Midway Questionnaire

Regarding the participants' attitude towards inspiration, the moments participants reported seeking inspiration were primarily in the beginning of the process and in the middle, but none reported seeking inspiration at the end of the process. This indicates that the wish for inspiration is predominant during the initial design phases of ideation, where the goal is to generate as much ideas as possible.

Students also found underrated and outlandish ideas more inspiring than iconic or real-life examples of successful solutions. Moreover, 80% of participants affirmed that seeking external inspiration is exclusively beneficial, while 20% agreed with limiting the exposure to inspirational stimulus for concerns with its influence. This is connected to one of the findings of the first questionnaire, where avoiding external inspiration was explicitly cited. However, no participant selected the option of avoiding all external inspiration, which points that all students, with varying degrees of intensity, rely on inspiration as a part of their process.

When asked specifically about widely recognized designs, a strong quintessential trait, as a source of inspiration, the answers were varied. 40% of participants viewed it as helpful, 20% viewed as unhelpful, and the remaining chose the alternative that it depends on the context (Figure 13). Such data appear to validate the assumption that quintessential products are not predominantly viewed as inspirational.

My view on using well-known or widely recognized designs in a product category as inspiration is that...

5 responses

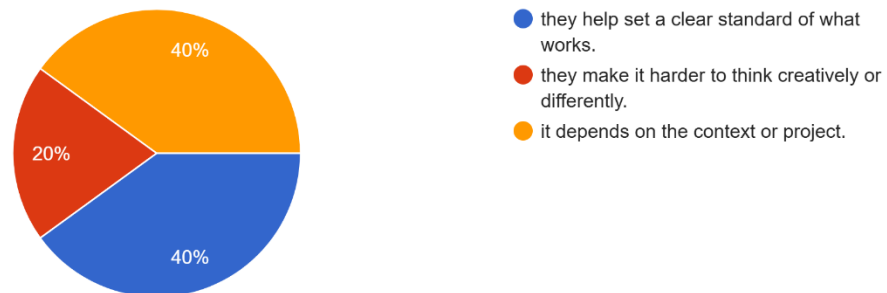


Figure 13. Question 5 of the Midway Questionnaire

Once they find an inspiration, most participants reported not making a conscious effort to utilize attributes from that inspiration. Only one participant reported analysing what makes the inspiration effective and trying to implement something akin to it. It can therefore be inferred that the inspirational stimuli selected by students is not necessarily used to its full potential but rather engaged with mostly superficially.

About dealing with creative blocks, all participants reported experiencing it at least once during the research period and 80% expressed having moments of fixation in their general design practice. The lack of clarity during a project was the most mentioned trigger for a creative block, such as an unclear brief or no clear path forward.

There were, however, many other diverse reasons outlined such as pressure to be disruptive, technical limitations, and lack of motivation. Thus, fear of repeating an existing solution, which would correlate to concerns for experiencing fixation, did not particularly stand out as a trigger among the other alternatives.

The strategy reported to help the most with creative blocks was by far discussing over ideas with colleagues, followed by, in this order: taking a moment to reflect, searching inspiration and, lastly, doing something hands-on (for example sketching, painting, modelling, etc). This reinforces the important and complex role team dynamics play on group projects, as previously noted on the first questionnaire.

When it comes to the team's creative process, the work dynamic has shifted to be more individualistic and the personal creative approach of the participants started to lean slightly to systematic, rather than intuitive as observed in the first questionnaire. This is corroborated

rated by the researcher's own observation notes of the group working sessions, where students primarily focused on individual activities. However, the dynamic shift and the approach change both seem to have had a negative impact. Students also reported a desire for more guidance and mentorship.

It would have been nicer to develop ideas more together, so we could have created shared concepts. (Participant B)

I've noticed that it hinders me a lot and eats a large chunk of my motivation. (Participant A, about shifting towards a more systematic approach)

These outcomes align with the hypothesis that, even though working in a team can greatly promote creativity through interpersonal exchange, the teams might have benefitted from more external structure to facilitate the moments of connection and draw out its full potential. Naturally, too much externally imposed structure may create rigidity and stifle creativity.

Therefore, moderate structure can simplify communication and increase clarity (Ji and Yan, 2020, 8). This would enhance overall team performance and allow for more opportunities for collaborative creative thinking. This is consistent with current literature which finds that externally imposed structure increases creativity for all individuals, regardless for their cognitive style (Sagiv et al., 2010, 17).

5.5 Closing semi-structured interviews

The verbal data, namely the transcriptions from the audio recording of each session, were transcribed and subsequently coded and analysed. The experience left both positive and negative impressions on the participants. The positive aspects were primarily connected with the enabling of individual and professional growth, for example, developing practical skills related to product development, such as 3D modelling.

It's nice to get some responsibility. (Participant C)

We were able to work on all parts of the design process, including background research, sketching, scale models, modelling, a mock-up, and visualizations. (Participant D)

The negative aspects came from a desire for more guidance and feedback. Participants felt that, although the opportunity to act autonomously was good at times, there was an overarching lack of structure.

But I expected the leadership to be more structured, like being checked up on more, and being led through it more. (Participant A)

This resulted in many moments of uncertainty and stagnation. Such moments hindered the participants' ability to progress confidently in the process. Thus, there was a strong wish to experience a realistic work life scenario where an experienced senior designer would aid in decision making and narrowing down ideas.

Sometimes we felt a bit lost with all these ideas. (Participant B)

One might conclude that, while independence is a crucial skill to be practiced, it should be ideally paired with moments of reassurance, for example, receiving feedback from another professional. This way, early-career designers can derive more confidence from such reassurance and, therefore, navigate the inherent uncertainty of a creative process to their full potential while still acting primarily independently.

This is in line with current literature, which states that autonomy in learning can foster creative confidence (Orakci, 2025, 9–10). Additionally, constructive feedback in an educational and supportive setting may enhance such confidence and improve the quality of work (Vo and Asojo, 2021, 5).

Participants also appreciated taking part in the research. Some exercises conducted, namely the Design out loud and the Inspiration log, were reported as helpful in sparking new ideas and breaking through creative blocks.

It was really good. And I, especially the word of the day thing, that was really good. I found it helpful, like to start the day with that. (Participant E)

It was also something nice to do when I was stuck with ideas. (Participant B)

6 Discussion

6.1 Limitations

The generalizability of these results is subject to certain limitations. The limitations of analysis include issues related to the sampling strategy, given the nature of the case study, which did not include a large sample of the design student population and thus may limit the representation of diverse perspectives within the design student community.

Moreover, some of the data relied on self-reports from participants. Therefore, retrospective accounts might create certain biases which do not perfectly represent the actual behaviours and attitudes of the participants.

Another challenge of the research process was the variety in nature of each project. While one brief was focused on practical aspects and technical limitations, another allowed more significant creative freedom. This might have generated inconsistencies between the experiences and perspectives of the students depending on their group and the brief associated.

6.2 Conclusion

This paper has sought to reflect upon quintessential designs and the effect they might produce during the creative journey of design students involved in a product development effort. The current findings point to that although quintessence did not play a major role in this instance, there may be an opportunity for educators and mentors to help teams utilize both their potential for collaborative work and the inspirational stimuli available more strategically.

The results presented in this paper indicate the potential value of moderate structure and quintessential products in the product design scope. Implementation of a moderate structure with resources to facilitate decision making, particularly in the convergent phases of the creative process, may enable students to operate at their full potential.

Moreover, quintessential products may be integrated into such resources as they provide useful examples of concrete, feasible solutions that help set standards and precedents for decision making. An area of application that can benefit from this is professional education within industrial design practice.

6.3 Future research

Baigelenov et al. (2025, 2–3) claim that design outcomes almost always result from combining to an extent previous designs, world phenomena, and the designer's personal experiences and knowledge. In other words, design is seldom originated from zero, including in

almost every case at least one or more sources of inspiration. Although the nature of inspiration in professional practice has been a popular research topic across design disciplines, little is known in relation to quintessence, including its effect and potential.

More studies are needed that explore not only how we may utilize the world around us and the products in our lives more intentionally as sources of inspiration for transformational radical design, but specially how we might empower students and emerging professionals to do so as well.

Everyday objects might be overlooked by creative professionals for their seemingly trivial nature, however, many of them, if not all, were the result of thoughtful and ingenious thinking and might even have reshaped their category. There is much to learn from the past, and, if designers are encouraged and supported to seek inspiration from it more consciously and actively, they might become more innovative as a result.

Therefore, it would be beneficial to understand the potential of quintessence in-depth and to develop a versatile tool to help early-career designers employ it seamlessly. A more experimental study with control groups and broader sampling could provide better evidence on structured ways to utilize quintessence in the educational context.

Acknowledgements

The author would like to thank the dedicated professionals at the Laboratory for Radical Innovations (LRI) and LAB University of Applied Sciences for the support and opportunity to study this topic, as well as the students who graciously and attentively participated in the research.

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7 Appendix 1. Questionnaire 1

(Some of the words have been changed to respect the non-disclosure agreements made with the client companies.)

The purpose of this questionnaire is to get a view into your initial thoughts and keep track of your creative process. Similar questions will be asked at the middle and endpoints. The answers will not be used for evaluation; only I, the researcher, will have access to them, and they will be anonymized before usage, i.e., personal identifiers will be removed. There are no right or wrong answers; feel free to answer as you wish. The estimated time to complete is 10 minutes.

Personal approach. This section is about your creative process as an individual.

1. Can you describe your personal creative process? Include, for example, what kind of methods/strategies you might use for dealing with the potential challenges.
2. Which attribute best describes your approach? [My approach is...]
 - a. Really innovative
 - b. Innovative
 - c. 50% innovative 50% pragmatic
 - d. Pragmatic
 - e. Really pragmatic
3. How influential do you consider each factor below in your personal creative process: (Select an option for each factor from the following: not influential, somewhat influential, very influential)
 - a. Personal taste/intuition
 - b. Brief requirements
 - c. Aesthetics trends
 - d. Iconic existing products
 - e. Experimental ideas

Team approach. This section is about how you view your team's creative process.

4. Can you describe your team's creative process? Include, for example, what kind of methods/strategies your team might use for dealing with the potential challenges. (If

you are part of more than one team, please specify if there are relevant differences between them.)

5. Which attribute best describes your team's approach? [Our approach is...]
 - a. Really innovative
 - b. Innovative
 - c. 50% innovative 50% pragmatic
 - d. Pragmatic
 - e. Really pragmatic

6. How influential do you consider each factor below in your team's creative process: (Select an option for each factor from the following: not influential, somewhat influential, very influential)
 - a. Personal taste/intuition
 - b. Brief requirements
 - c. Aesthetics trends
 - d. Iconic existing products
 - e. Experimental ideas

7. If you are part of more than one team, and there are differences regarding the two questions above, use this space to outline those differences and please specify the teams you are referring to.

Project specific questions. This section refers to the Company X project. Please skip if this does not apply to you. (This same section was asked thrice, one for each project.)

8. In your words, what is the perfect (product related to project)? Describe its characteristics, including functionality and appearance.
9. What are real-life examples of your idea of a perfect (product related to project)? (Include links to 1-3 products. They do not need to be currently available, but they must have been manufactured and sold at some point in time.
10. What challenges do you foresee/expect in achieving the brief?

Thank you for answering!

11. Are there any questions you would like to ask me?

8 Appendix 2. Questionnaire 2

The purpose of this questionnaire is to dive a bit deeper into certain aspects of your creative process, following up on some topics of the first questionnaire. As with the first questionnaire, these answers will also not be used for evaluation; only I, the researcher, will have access to them, and they will be anonymized before usage, i.e., personal identifiers will be removed. There are no right or wrong answers; feel free to answer as you wish. The estimated time to complete is 5 - 7 minutes.

Finding inspiration. This section is about your personal approach to seeking and utilizing inspiration.

1. I usually look for inspiration...*Check all that apply.*
 - a. In the beginning of the design process.
 - b. In the middle of the design process.
 - c. At the end of the design process.
2. The phrase that most closely aligns with my perspective on inspiration is... *Mark only one.*
 - a. that it is exclusively beneficial, the more the better.
 - b. that it can be beneficial to a certain degree, as it might influence me too much.
 - c. that it should mostly avoided and sought out only on necessary situations.
3. I find most inspiring to me...*Mark only one.*
 - a. outlandish ideas that open my creativity.
 - b. real-world examples of successful products.
 - c. iconic symbols of style.
 - d. underrated but brilliant solutions.
4. When I find an inspiration source that I like, I... *Check all that apply.*
 - a. keep it in mind loosely, without trying to apply it directly.
 - b. consciously analyze what makes it effective and try to integrate similar qualities.

- c. revisit it often during the process to guide my design decisions.
 - d. I rarely use it after initially viewing it—it just sparks ideas.
 - e. am not sure / it depends on the project.
5. My view on using well-known or widely recognized designs in a product category as inspiration is that...*Mark only one.*
- a. they help set a clear standard of what works.
 - b. they make it harder to think creatively or differently.
 - c. it depends on the context or project.

Dealing with creative blocks. This section is about your personal experience and strategies relating to creative blocks.

6. Sometimes an idea gets stuck in my head, and it is hard to generate ideas different from it. *Mark only one.*
- a. Strongly disagree
 - b. Disagree
 - c. Agree
 - d. Strongly Agree
7. I have experienced one or more creative blocks during the current project. *Mark only one.*
- a. True
 - b. False
 - c. Not sure
8. The factor most likely to trigger a creative block for me is...*Check all that apply.*
- a. Pressure to be disruptive
 - b. Fear of repeating existing solutions
 - c. Unclear brief
 - d. Too many ideas
 - e. Other:

9. When I feel stuck, I find it helpful to... (Please rank the alternatives from most helpful to least helpful.)
- a. Discuss my ideas with other people
 - b. Look for external inspiration
 - c. Take a moment to reflect on my thoughts
 - d. Do something with my hands

Project's progress. This section is a follow-up on your experience working in your team(s) so far.

10. Since the beginning of my project, I think my individual contribution within the project has been... [My approach has been]
- a. Really innovative
 - b. Innovative
 - c. 50% innovative 50% pragmatic
 - d. Pragmatic
 - e. Really pragmatic
11. Since the beginning of my project, I think our teamwork has been... [Our approach has been]
- a. Really innovative
 - b. Innovative
 - c. 50% innovative 50% pragmatic
 - d. Pragmatic
 - e. Really pragmatic
12. (If you are in more than one team, please write your answer for the previous question here but in relation to your other team and specify which team you are referring to.)
12. How influential has each factor below been in your team's creative process: (Select an option for each factor from the following: not influential, somewhat influential, very influential)
- a. Personal taste/intuition

- b. Brief requirements
- c. Aesthetics trends
- d. Iconic existing products

13. (If you are in more than one team, please write your answer for the previous question here but in relation to your other team and specify which team you are referring to.)
14. Think back to the first questionnaire, when you described how your team's creative process would be - has the creative process in your project been as you predicted? Has anything stood out as surprising or different? (If you are part of more than one team, please specify if there are relevant differences between them.)
15. Is there anything you wish was different in your teamwork? (If you are in more than one team and there are relevant differences, please specify which team you are referring to.)

Thank you for answering!

16. Is there anything you would like to ask me or give me feedback on?

9 Appendix 3. Inspiration Log Prompts

Beginning of the day prompts

Day 1. The word of the day is: **iconic**. Please use the next 15 minutes (maximum) to look for a source of inspiration (it could be a product, a packaging, a piece of art, anything) that fits today's theme and send it to me.

Day 2. The phrase of the day is: **weird in a good way**. Please use the next 15 minutes (maximum) to look for a source of inspiration (it could be a product, a packaging, a piece of art, anything) that fits today's theme and send it to me.

Day 3. The word of the day is: **timeless**. Please use the next 15 minutes (maximum) to look for a source of inspiration (it could be a product, a packaging, a piece of art, anything) that fits today's theme and send it to me.

Day 4. The word of the day is: **unexpected**. Please use the next 15 minutes (maximum) to look for a source of inspiration (it could be a product, a packaging, a piece of art, anything) that fits today's theme and send it to me.

Day 5. It's the last day! And... **You choose** your word of the day today! Please select an adjective. Ideally, your adjective shouldn't have an inherent positive or negative association (e.g. "good", "amazing" or "boring"). Try to pick an adjective that describes a quality you find interesting. Use the next 15 minutes (maximum) to look for a source of inspiration (it could be a product, a packaging, a piece of art, anything) that fits your selected adjective and send it to me.

End of the day prompt

How was your ideation today? Did the theme affect your ideation? If so, how? (Take as much or as little time as you want to answer)

10 Appendix 4. Design Out Loud Sketching sheets

PRACTICE ROUND	Sketching Area			
Page number:				
<p>Draw what your favorite lunch is like. Say out loud every thought that comes to your head as you are drawing. Do this during the next rounds as well.</p> <p>time: 5 minutes</p>				
<p>Example: "I'm going to draw falafels with salad. I'm drawing them in separate sides of the plate because I don't like when the sauce touches the falafel, it makes them soggy."</p>				

Figure 14. Design Out Loud, Sketching Sheet - practice round.

ROUND 1	Sketching Area			
Page number:				
<p>On the left side, draw a typical video game controller. Next, draw on the right side what a future video game controller might look like. Think what could be improved and how the technology might evolve.</p> <p>Make as many sketches as you like.</p> <p>time: 20 minutes</p>				

Figure 2. Design Out Loud, Sketching Sheet - round one.

ROUND 2	Sketching Area
Page number:	
<p>Imagine you are no longer yourself - you are an octopus.</p> <p>You live underwater, have excellent spatial memory and eight flexible limbs, which are capable of suction, sensing taste, and are independent from each other.</p> <p>Now, as the octopus, design a video game controller that would be ideal for you.</p> <p>Make as many sketches as you like.</p> <p>time: 20 minutes</p>	

Figure 15. Design Out Loud, Sketching Sheet - round two.

11 Appendix 5. Semi-structured interview guide

General questions

When you think about this project, what's the first feeling or thought that comes to mind?

- Follow up: Has it compared to your expectations?

Core questions

Which stages of the design process did you find most inspiring and why?

- Follow up: What about the most challenging?

Did you achieve everything you wished to?

- Follow up: Is there anything you would've done differently?

How would you rate your confidence in your creative skills now, compared to the beginning?

- Follow up: Which skill do you believe was improved the most?

What advice would you give yourself if you were to begin this design process again?

Closing question

Is there anything you would like to add or give feedback on, either about the project or about participating in this research?