Research on the application of improvisation in creative design process

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Abstract. This work explores the evolution of improvisation and its consequences in the design domain, focuses on its applicative value within the design process, dives into the significance of improvisation in design, and presents a team-based creative design framework anchored in improvisation. Utilizing an approach integrating theoretical synthesis and methodological practice, this study comprehensively analyzes team design processes and activities, along with an examination of the challenges encountered by design teams. To investigate how to incorporate improvisation into the design process, this study employs the method of theoretical integration and comprehensive analysis of method practice, summarizes the team design process and design activities, and analyzes the problems and challenges faced by the team design. In the face of problems such as poor communication, lack of motivation, exhaustion of inspiration, and fixed thinking faced by design teams during the creative conception stage, improvisation encourages designers to explore any possible ideas and creates a relaxed and humorous design environment, which can effectively break the fixed thinking of design, expand creative thinking space, promote team cooperation and communication, and improve team collaboration efficiency.

Keywords: Improvisation; Design study; Design process; Team ideation.

1. Introduction

Improvisation falls within the broad category of creativity, referring to a process of continually receiving new inputs and generating new outputs[1]. Research indicates that engaging in activities such as literature, reading, writing, and drama, which utilize creative dramatic techniques, enhances participants' self-expression and performance abilities, fosters the generation of original ideas, and strengthens creativity. In the context of team-based design ideation, both creativity and self-expression are of paramount importance. Therefore, this paper aims to explore how to integrate improvisational methods into the ideation phase of design teams to promote team members' divergent thinking and collaborative abilities.

2. Research review

2.1 Evolution and development of Improvisation

Improvisation, colloquially referred to as improv, has a historical lineage that dates back to the Italian Renaissance period, where it initially emerged as a technique within performance and musical arts. Over time, it has evolved into a multifaceted concept with applications extending beyond artistic domains. Defined as the spontaneous execution of tasks or creative pursuits devoid of preconceived plans, improvisation involves leveraging existing resources to tackle unforeseen challenges. While its roots lie in artistic expression, improvisation has transcended traditional boundaries and found relevance in various disciplines, including management, medicine, and education[1]. This interdisciplinary adoption underscores its versatility and adaptability in navigating complex and dynamic environments, highlighting its significance as a strategic tool for problem-solving and innovation across diverse contexts.

Improvisation is a process of continuously receiving new inputs and generating new outputs[1]. Improvisational activities such as dance, theater, and music involve rapid thinking based on one's own actions and those of other performers, followed by the selection of new performance actions.
Alterhaug's research indicates that in music composition, an atmosphere of trust and freedom fostered by improvisation can lead to high-quality communication[2]. Keith Johnstone, during his tenure as Deputy Artistic Director at the Royal Court Theatre, developed and utilized improvisational techniques and exercises to promote spontaneity and narrative skills among actors[3].

Improvisation is a process of rapid thinking and decision-making, aiming to produce as many ideas and solutions as possible. Some studies suggest that activities such as literature, reading, writing, and drama, utilizing creative dramatic methods, can enhance participants' self-expression and performance abilities, stimulate them to generate original ideas, and strengthen creativity[4][4]. Anna and Annarella et al. explored the impact of improvisational comedy training on children's creativity and communication skills[5]. The results indicate that children educated through dramatic methods exhibit more refined creativity, incorporating more new elements, being more innovative, and more interesting. Furthermore, their communication skills are more expressive, and their expressions are clearer and more detailed.

2.2 Improvisation in design

2.2.1 Improvisation in the field of design research

The principles of improvisation include basing contributions on each other, capturing ideas from the obvious, spontaneous action, embracing failure positively, and storytelling, requiring participants to think quickly and make decisions while building upon each other's contributions.

On one hand, applying improvisational techniques to the design process can enhance designers' spontaneity, innovation, teamwork, as well as their abilities in expression and presentation. In 2000, Eva Brandt et al. explored how to apply theatrical techniques to participatory design processes. The results showed that using theatrical techniques and props in participatory design processes could help users actively engage and share their ideas about future technologies[6]. Elizabeth Gerber discussed how improvisational performance supports design work and how design benefits from improvisation based on research cases. She suggested that improvisation promotes designers' ability to quickly learn from failure and continue moving forward with a more enthusiastic and positive mindset on a personal level[7].

On the other hand, engaging in improvisational training before the design process has a certain effect on enhancing design creativity. Through improvisational training, designers can freely explore and express themselves in a pressure-free environment, thereby stimulating their potential creative abilities and injecting new inspiration and ideas into the design process. Research by Barry Kudrowitz suggests that improvisational training is a warming-up method conducive to idea generation. He found that conducting improvisational training before designing allows designers to generate more and better ideas[8].

Moreover, improvisation necessitates that team members actively listen to and build upon each other's ideas. Designers, by temporarily suspending judgment and fully engaging in attentive listening, prioritize the present moment over their individual thoughts. This allows them to dedicate their focus to actively listening to and responding to the input of other participants, rather than solely advancing their own viewpoints outside the context of ongoing group discourse. Through this collaborative listening and responsive approach, teamwork is fostered, and the efficacy of creative ideation is heightened.

2.2.2 The application of improvisation in creative conception activities

The effective use of creative methods can provide a structured and systematic way to stimulate creativity and spark inspiration in the creative ideation process. Based on the effectiveness of improvisation in the design process, some scholars have recently studied how to develop specialized design methods based on improvisation, such as the "Yes and," "Body Sketch," and "Half Life" improvisational training methods. Gillian Hatcher et al. further developed the Design Improv design guidelines, the process and steps of which are illustrated in Figure 1, used to generate ideas in the
early stages of team design[9]. The discussion step guides participants to share personal anecdotes, knowledge, and experiences related to the task, helping designers analyze and define design problems. In the "Yes And" step, designers quickly build upon ideas and develop new ones based on others' contributions, ensuring mutual listening among members and focusing on the task theme. The fourth step involves identifying unusual ideas, where members quickly evaluate the generated ideas and select the most creative one. Subsequently, team members refine this idea using the "If Then" principle, delving into this interesting idea without the need to build upon previous ideas. After thoroughly refining this most interesting idea, the facilitator guides the team to end the round and return to "Yes And" with brand-new ideas. Preliminary research suggests that this method creates a relaxed and humorous design atmosphere, encourages the development of "wild" ideas, and can overcome barriers such as fear of judgment during brainstorming, unequal contributions, premature rejection of ideas, fixed concepts, and production blocks, thus expanding the solution space and promoting divergent thinking[10].

2.2.3 The team creative design process based on improvisation.

The typical design process consists of stages such as defining problem scope, developing alternative solutions, and implementing design[11]. It involves activities like problem definition, information gathering, idea generation, design refinement/iteration, feasibility analysis, solution evaluation, decision-making, drafting, modeling, reporting, and other design activities. Design is not a simple linear process but involves the iterative transformation of various design activities and design thinking. The team collaboration process is a more complex design process where team members need to continuously communicate to share information, ideas, and make design decisions. In the team creative ideation process, design teams generally use brainstorming methods to generate ideas. However, effective brainstorming processes face various challenges, including members' self-censorship due to fear of judgment, social loafing leading to uneven participation contributions, premature idea rejection resulting in overlooking some creative ideas, premature fixation on certain ideas leading to mental rigidity, and obstacles arising from forgetting ideas during turn-taking[9].

Improvisation can help participants open their thinking and facilitate designers in generating more ideas. The "Yes And" technique primarily drives the ideation process, based on the principle of constructively expanding on others’ ideas, which promotes effective listening and in-depth discussions among designers, ensuring that each idea is thoroughly explored. This establishes a more interconnected and task-focused ideation process. By delving into an idea, the "If Then" technique can help designers efficiently focus on the design refinement/iteration activities. This study advocates for the integration of improvisation methodologies into the creative design process, as depicted in Figure 2. During the phase dedicated to formulating alternative solutions, the design team initiates the utilization of the "Yes And" technique, fostering a continuous ideation process centered around the design challenge. Here, the principle that novel ideas must build upon preexisting ones, with team members prioritizing idea generation while deferring judgment. Following this phase, the most innovative concepts are identified from the pool of brainstormed
ideas and subjected to refinement through the "If Then" technique. This iterative approach allows for the exploration of diverse ideas and solutions, perpetuating a cycle of refinement and enhancement.

Fig. 2 Creative design process based on improvisation

3. The practice of improvisation in team creative design

3.1 Conduct improvisation-based design workshops

Based on the incorporation of improvisation into the design process, this study conducted five groups of improvisational design workshops. Each workshop consisted of 3-5 participants and a facilitator, all of whom were graduate students majoring in industrial design (designated as groups a, b, c, d, e, and participants numbered P1 to P16, respectively). At the beginning of each workshop, the facilitator introduced the principles of improvisation and the specific process of the workshop to the participants. Then, the team members were asked to creatively design the kitchen of the future in a collaborative manner. Through observational methods and retrospective interviews, this study will explore the specific application effects and value of improvisation in the design process.

The specific process of the design workshop is as follows:

In the first stage, the primary task of the team is to gather and share relevant information and case studies, conduct a detailed analysis, and define the design problem. During this stage, the design team can start by analyzing personal experiences, identifying design pain points, compiling design requirements, and determining the general direction of the design. In the second stage, based on the design direction identified in the first stage, the design team enters the improvisation phase. They start by using the "Yes And" technique to quickly generate a large number of ideas, timed for 5-10 minutes. During this time, the design team must adhere to the principles that new ideas build upon existing ones and suspend judgment. After the allotted time, the team uses the "If Then" technique to refine the most interesting and creative ideas selected from the brainstormed ideas. The aim is to develop a complete solution around this idea, adding new details until no further additions are possible. Next, the team needs to conduct feasibility analysis and evaluation of the solutions and ideas. The team can choose to return to the "Yes And" step for another round of improvisation or proceed directly to the next design stage. The third stage involves decision-making and presentation of the design solutions. The team needs to select the most feasible and creative solutions through multidimensional evaluation and present and describe the specific solutions using various formats such as sketches and written descriptions.

3.2 The team design process under the influence of improvisation

Through experimental observations and retrospective analysis, the author summarized the team's ideation process under the influence of improvisation, as follows:

In the early stages of design, the design team first conducts a simple problem analysis and information gathering around the design task. Problem analysis mainly involves breaking down issues and analyzing requirements. For example, participant P5 initially raised issues encountered in their kitchen, stating, "Speaking of issues, I feel that the usage rate of our dishwasher at home is very low. Our dishwasher is opened from the top, and the top is often used for storage. Every time we use it, we have to clean the top before using it." Information gathering mainly revolves around existing cases or relevant facts that have been observed to identify design opportunities. For
example, participant P2 mentioned kitchen-related problems they had recently seen, "I recently saw a kitchen where flour was used for kneading dough. If the flour encounters an open flame in the stove environment, it will cause a dust explosion, which I think is very dangerous." The team then further ideates around this situation.

Around the problem requirements and opportunities identified in the early stages, the design team began using the Yes And technique to rapidly generate many ideas. For example, based on the issue raised by participant P5 about seasoning bottles being prone to moisture, the team quickly generated new ideas such as "Is there a refrigerator that can be placed on the countertop to prevent moisture," "Or it's not a refrigerator, it's something dry, to design something to keep it dry," "I think refrigerators should all have that kind of drying function,"... In this process, Yes And continually stimulates the generation of new ideas, promoting the continuous divergence of the design team's thinking to generate more interesting ideas. At the same time, designers typically use traditional pen and paper at this stage to record ideas and draw mind maps to assist in the divergence of ideas.

After generating a large number of ideas, the design team selects one idea for further refinement. For example, after participant P3 proposed designing a specialized box for storing seasoning, the team began using the If Then technique to preliminarily refine this idea to form a more complete solution. For instance, "This box can have a display showing the date it was put in and taken out," "It can also add a weighing device to show the amount used, usually people have to look at the recipe, but the bottle can show how much is left," "So, its original capacity is 35 grams, and then as you pour, say, 2 grams, it then becomes 33 grams, meaning it can display the weight of the contents inside," "The material is usually glass or plastic, but it can also be designed to have a replaceable outer layer" ... Eventually, the team produced a multifunctional storage box for seasoning. In this process, the team focuses closely on refining the selected idea, typically by adding details to improve the idea and solution based on existing ideas. At the same time, the design team also records the key details of the solution and draws simple sketches to explore possible shapes or structures.

Afterward, the team will re-enter the idea generation stage, using the Yes and technique to brainstorm new ideas from different perspectives, and then refine the solutions again using the If Then technique. In summary, the Yes and technique stimulates the team to continuously generate new ideas to promote divergent thinking, while the If Then technique helps refine the details of ideas to form more complete solutions.

4. The application value of improvisation in team design

(1) Expanding Designers' Cognitive Space

Improvisation demands that designers react quickly within a short period, forcing them to think rapidly and express ideas without constraints. This rapid response process helps break conventional thinking patterns, sparking new creativity and solutions. Moreover, improvisation encourages designers to boldly experiment and freely unleash their imagination, exploring various possibilities without restrictions. This free creative environment helps expand designers' imagination and creativity, thereby generating more innovative and unique design concepts, ultimately expanding the cognitive space of designers.

(2) Facilitating Collaboration Among Team Members

Improvisation requires designers and improvisational performers to build new ideas based on others' ideas in collaborative creation, and to remain open to unexpected possibilities. The "Yes And" technique embodies this principle in the design process. Teams not only focus on their own ideas during the brainstorming process but also actively listen to and consider the potential development of other members' ideas. This effectively enhances the cooperative relationships among members. Additionally, improvisation guides members to listen attentively and respond actively, helping each person feel heard and valued in the conversation[12]. Through the "Yes And"
technique, improvisation encourages active collaboration among team members, propelling the dialogue forward and ensuring that all team members can contribute.

3. Enhancing Team Collaboration Efficiency

In the "Yes And" step, the design team focuses on brainstorming ideas within a limited time frame, which makes it easier to find common goals and directions while concentrating their attention. This contributes to swiftly advancing the design project. After identifying unusual ideas, team members promptly evaluate and select the most creative ones, avoiding delays and uncertainties in the decision-making process. This rapid evaluation and selection process helps the team quickly determine the design direction, thereby improving decision-making and execution efficiency. In the "If Then" step, the team focuses on refining the proposed ideas into concrete plans. Throughout the process, team members stay focused on the task at hand, avoiding spending excessive time on irrelevant or unimportant ideas, thus enhancing work efficiency.

5. Summary

Currently, designers face multiple challenges during the team ideation phase, including communication barriers, lack of motivation, creative block, and cognitive rigidity. These issues not only negatively impact the generation of ideas and collaboration within the team but also directly affect the quality of the final design solutions and the overall efficiency of the team’s work. This paper proposes integrating improvisational techniques and principles into the process of conceptual ideation and design refinement, encouraging designers to freely express ideas and facilitating the rapid generation and exchange of ideas. Conducting design activities based on improvisation allows team members to explore various possibilities in an open and relaxed atmosphere, expanding the designers’ mental space, facilitating communication and collaboration among team members, and enhancing the efficiency of teamwork.

References


