# Products with A Sense of Humor: *Case Study of Humorous Products with Giggle Popper*

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Humor has been recognized as being important in promoting people's wellbeing and happiness. However, studies on the practical use of humor in the design process remain limited. The current work investigated the use of Giggle Popper, a set of principles for creating humorous products, as a conceptual model in the design process and examined its value for humorous product design by looking at case study projects. We observed how designers accomplished a design project involving the design of humorous water fountains using a software tool inspired by Giggle Popper. Three concepts from the Giggle Popper framework study were chosen for the investigation in order to evaluate the way in which designers developed three final prototypes: the Gas-Stove, the Hold-My-Hands, and the Slap-on-My-Face fountains. The findings suggest that Giggle Popper was helpful for improving and developing humorous products throughout the design process: including idea development, decision making, and implementation. Each principle was used interchangeably rather than independently, triggering the application of ideas derived from other principles. The principles of Giggle Popper were chosen and applied according to the characteristics of a product in order to create the proper context for humor. This paper demonstrated cases that showed how designers can use proposed design principles for real products. The findings of this study could help us to understand how designers and researchers use humor in the design process. The findings can contribute to practical design knowledge about how to create humorous products and can offer guidance on how to evoke positive emotions through products.

***Keywords*** – Design Principles, Giggle Popper, Humor, Humorous Product, Positive Emotion

***Relevance to Design Practice*** – The findings of this study can help designers and industry practitioners understand the delivery of positive emotions through products and how to introduce humor into the design process.

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## Introduction

Arousing positive emotions, such as enjoyment and amusement, has been recognized as essential in everyday life. Humorous products provide a unique functionality by evoking positive feelings in people, stimulating users' curiosity, and encouraging them to share their experiences with others. Laughter and amusement have been studied in psychology, and their characteristics and origin have constituted a major theme in humor research (Martin, 2010; Mulder & Nijholt, 2002; Wiseman, 2002). Designers and researchers have acknowledged the importance of linking laughter and fun with products, advertisements, and communication design (Bartos, 1981; Blythe, Overbeeke, Monk, & Wright, 2004; Hoonhout & Stienstra, 2003; Kince, 1982). The design domain features various conceptual and theoretical guides for designing products that evoke positive emotions (Hekkert, 2006; Jordan, 2010). However, the frameworks and principles deduced in previous works are difficult to apply in the design process, and studies on the practical use of humor in the design process are insufficient.

Recently, a set of design principles for creating humorous products was introduced as a conceptual tool for designing humorous products, called Giggle Popper (Yu & Nam, 2014; Yu, 2015). It consists of nine principles: the visualization of taboos, bizarre consequences, destructive play, zoomorphism, self-deprecation, abused products, shape incongruity, unconventional use, and unexpected functions. A set of design principles for creating humor in products is useful in developing ideas in the conceptual design phase (Yu & Nam, 2014). However, the design process of creating humorous products remains poorly understood, including the improvement and development of ideas with respect to materials, the creation of new ideas, and user-product interaction.

The current work presents case studies involving the creation of humorous products. An effective procedure for improving the current understanding of the application of humor in the design process would require creating design outcomes, while observing and reflecting on the process. Therefore, we chose a research method for carrying out actual design projects by demonstrating the design process involved in creating humorous products using Giggle Popper. The three case studies show how

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designers develop their ideas, make choices, and prepare a model based on a set of design principles. In the reminder of the paper, Giggle Popper and the theoretical grounding of the present study are introduced. Then the case studies in which humorous products are designed are illustrated. Based on the findings, the value and implications of using conceptual tools as an aid to designers in the process of designing humorous products are discussed.

# Understanding Humor

## Conventional Theories of Humor

Humor is a psychological state characterized by the positive emotion of amusement and a tendency to laugh (Mulder & Nijholt, 2002). Martin (2010) classified humor that occurs in everyday social interactions into jokes, spontaneous conversational humor, and accidental or unintentional humor. Park (2001) summarized the various types of humor, including wit, satire, and irony, for use in visual communications design. Humor has been a research theme in multi-disciplinary fields that relate to psychology, philosophy, linguistics, sociology, and literature (Martin, 2010). Humor research has explored the mechanism and reasons for laughter, and attempted to answer the fundamental question of why and under what circumstances people laugh and feel amused. Indeed, humor is regarded as a significant aspect of wellbeing, physical health, and psychotherapy.

With respect to the wide range of research findings, the conventional literature on humor features a division of basic theories into the following categories: incongruity, superiority, relief, and violation theory (Martin, 2010; McGraw & Warren, 2010; Mulder & Nijholt, 2002; Wiseman, 2002). Incongruity theory argues that humor occurs when there is a mismatch or clash between sensory perceptions and abstract knowledge or concepts. According to this theory, humor depends on unexpectedness or the element of surprise (Martin, 2010). Superiority theory posits that when people see the misfortune of others, laughter is evoked, potentially reflecting the observer's superiority (Martin, 2010; Mulder & Nijholt, 2002; Wiseman, 2002). Relief theory describes humor from a personal perspective. Laughter is evoked when stressful situations are removed. Meanwhile, violation theory is a relatively recent theory stating that laughter is evoked following the correct interpretation of an individual's seemingly violated situation (Veatch, 1998).

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## Humor for Design

Researchers have attempted to assess the effectiveness of humor, and its influence on attention, and it positive effects (Fugate, 1998; Lyttle, 2001; Mesmer-Magnus, Glew, & Viswesvaran, 2012), its impact on purchase intention (Eisend, 2009), as well as methods for its effective use (Puranik, 2011; Spotts, Weinberger, & Parsons, 1997). In communication design, humor has been treated as a design element, as a visual pun, and as an element of graphic wit (Abed, 1994; Heller, 2002; Kince, 1982; Snape, 1993). Humor and jokes in TV commercials deliver a message and a story; particularly, reversal is viewed as an essential factor in creating humor. In visual communication, the use of visual puns (Abed, 1994; Kince, 1982) and graphic wit (Heller, 2002) is important in properly presenting the dual meanings of a message. Only when the receiver understands the dual meanings does the situation become amusing.

There have been various attempts to deliver positive emotions through interactive products. (Bekker, Sturm, Wesselink, Groenendaal, & Eggen, 2008; Faber & Van Den Hoven, 2012; Nam & Kim, 2011; Pfister, Yun, Sohn, & Lim, 2011; Yoshida et al., 2009). Bekker et al. (2008) examined the influence of open-ended play using interactive play objects in social interaction and also examined children's experiences of fun. Faber and Van Den Hoven (2012), through an iterative design process, investigated how the experience of fun can increase in relation to the tangible aspects of a game

Empirical studies based on humor have been conducted in product design. Ludden, Schifferstein, and Hekkert (2007, 2008, 2012) conducted research into the design of products that appeal to the senses through their visual or tactile appearance. Kudrowitz (2010) found that humor helps elicit more creative and varied ideas in the design development phase. The studies of Kudrowitz (2010) and Ludden et al. (2007, 2008, 2012) are meaningful because they establish the relationship between design and humor. However, these studies investigated limited areas, such as incongruity factors and the stages of creating ideas, and cannot be applied generally to the design process itself. In addition, the incorporation of humor into products involves different factors, such as use, context, function, and user experience. Therefore, there is still a need to investigate the practical ways in which humor can be applied in product design, with consideration for various usage contexts.

## Giggle Popper: *A Set of Principles for Creating Humorous Products*

Recently a conceptual model was proposed regarding the humor evoked through products using concepts of humor and positive emotion (Yu & Nam, 2014). The research tapped the specialized views and knowhow of professional comedians and experienced designers. To deduce the design principles for creating humorous products, researchers collected and analyzed existing humorous products with the help of professional designers. Design researchers and professional designers helped them to identify humor patterns. The grounded theory method was used for the analysis.

A significant finding was that experience delivered by humorous products takes place on three levels: the representational level, the user context level, and the operational aspect level. In addition, three major approaches for generating humor in products were identified: the use of cognitive incongruity, emotional superiority, and relief from social violation. Incongruity in product design is often achieved by creating incongruity between the visual appearance and purpose of a product as well as through basic design factors, such as size, material, color, and shape, or between the visual appearance and anticipated function of a product. As is the case with conventional theories of humor, superiority in product design is manifested in the relationships which are established between a product and its user, and the relationship between the user and the observer. For example, the principle of superiority applies an animal or an object to a product's appearance in small size and makes the product appear to do a demanding job to perform its function. This situation of use makes the user want to help or pity the product. The principles of relief from social violation are dependent on materials that are socially regarded as having taboo factors inherent in their design, so that adopting them undermines social and moral norms.

The previously proposed set of principles for creating humorous products, which are incorporated into Giggle Popper, are classified into two major dimensions: the first dimension includes three aspects of humorous experience and the second dimension includes three approaches to creating humor in products (Yu & Nam, 2014; Yu, 2015). Together these produce nine spaces with different attributes and distinct principles applied to the products associated with each space. The principles of the nine spaces are as follows: the visualization of taboos, bizarre consequences, destructive play, zoomorphism, self-deprecation, abused products, shape incongruity, unconventional use, and unexpected functions. To understand how the principles are used in the conceptual design phase, we conducted design sessions for creating humorous water fountains and verified Giggle Popper as an effective tool for deducing various ideas (Yu & Nam, 2014). However, the role of Giggle Popper in the entire design process was not fully investigated. Design practice includes not only exploring novel concepts but also considering the materials to be used, efficient implementation, and user-product interaction. Design evolves through numerous design decisions in the detail design and prototyping phase. Questions remain on how designers can use Giggle Popper to design actual working products.

## Design Workshop for Humorous Water Fountains

### Aim and Method

The aim of the design workshop was to shed light on designers' processes of designing humorous products with Giggle Popper. By investigating the design process through observation and interviews, we sought to identify the application of Giggle Popper throughout the design process and its role on the design development of humorous products. Therefore, this study explored the stages where a designer plays the main role, including idea development and the implementation of working prototypes.

**Table 1. Giggle Popper: A set of principles for creating humorous products** (Yu & Nam, 2014; Yu, 2015).

| *Principles* | *Guidelines* | *Representative Case* |
|---|---|---|
| Shape incongruity | • Copy other objects<br>• Break original scale<br>• Break general proportions |  |
| Unconventional use | • Use a familiar shape for an inconsistent purpose<br>• Use a product for purposes different from the stated purpose |  |
| Unexpected function | • Create brand-new functions that cannot be predicted from the product's appearance |  |
| Zoomorphism | • Use a small-sized animal or human shape<br>• Make users recognize the shape as fragile and alive |  |
| Self-deprecation | • Represent the funny appearance of the user<br>• Make the user share his/her amusement with others |  |
| Abused product | • Use an anthropomorphized object<br>• Make products do a demanding job |  |
| Visualization of taboo | • Use shapes or messages that are banned<br>• Destroy norms |  |
| Bizarre consequences | • Generate bizarre situations with user participation<br>• Display outrageous situations |  |
| Destructive play | • Involve the user in play to break social rules<br>• Perform an act or create a situation that one cannot possibly engage in under ordinary circumstances |  |

Nine senior students majoring in industrial design participated in the design workshop. The participants developed concepts on humorous water fountains in teams consisting of three students in each team. Three initial concepts were chosen from a previous ideation workshop (Yu & Nam, 2014) and presented for the participants to refine. We were interested in exploring how participants applied Giggle Popper to the real product while developing ideas and applying them. The three representative ideas were initially drawn from 60 ideas derived from the ideation of 18 designers. The final three ideas were selected with the aid of professional designers. These ideas on humor contained the representative Giggle Popper principles, and they were used as initial ideas in this case study. We believe that this method helped us focus on the process from idea development to implementation, and enabled us to manage the schedule of the workshop effectively. Participants developed three initial ideas into practical concepts for three humorous products, instead of adapting three initial ideas to their products directly. We asked the participants to develop a working prototype of their final selected concept. Each project was conducted within 12 to 14 days from idea development to implementation.

The three concepts include *Gas-Stove*, a water fountain in the shape of a gas stove; *Lay-Your-Hands*, a fountain with hands that a user holds to drink water; and *Slap-on-My-Face*, a fountain that a user needs to slap on a specific area to drink water. These three concepts were used as the basic ideas for the case studies.

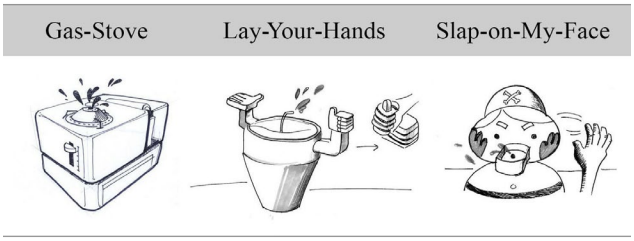



**Figure 1. Sketches of the initial concepts for humorous water fountains.**

A software application running on a tablet computer (A in Figure 2) and humorous product cards (B in Figure 2) were used to show the principles of Giggle Popper to participants. The software application contained a set of design principles, sample cases, and guidelines. The humorous product cards included the product name, product image, main functions, and source of humor, which were selected to reflect the three aspects of experience found in previous studies.

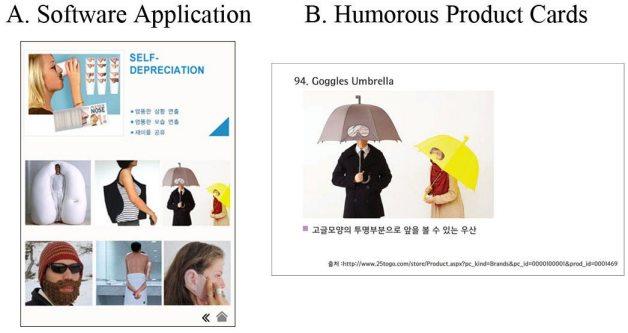



**Figure 2. Presentation of Giggle Popper for design development.**

## Uncovering the Design Process with Giggle Popper

The teams further developed each product idea from the initial concept to the final prototype. Idea development proceeded in several steps. The concepts were evolved by the participants in each step applying Giggle Popper principles. To achieve the study objective, we observed the design process used by designers who used humor through Giggle Popper systematically, from the product idea stage through the implementation of working prototypes. The final production of working prototypes of the three cases was recorded in detail. The participants were asked to recount the progress of their project in their self-report, prepared daily (Figure 3). We analyzed the self-reports written by participating designers and interviewed participants regularly to identify the potential and limitations of Giggle Popper in the design process.

Design project name : "Slap-on-My-Face"

| | |
|---|---|
| Date | 2014. 8. 4 |
| Designers | 박정우, 이원탁, 박성원 |
| Main issue | - 적절한 얼굴 형태<br>- 유머스러운 얼굴 표정 스터디<br>- 얼굴의 요소를 활용한 인터랙션 구성 |
| Project Image |  |

Design project name : "Slap-on-My-Face"

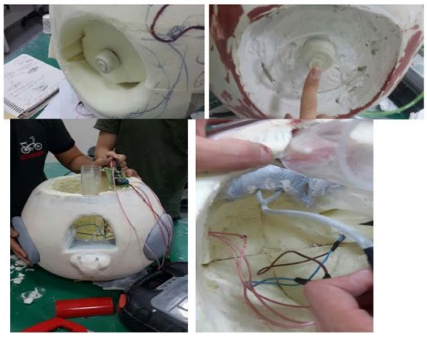
| | |
|---|---|
| Date | 2014. 8. 10 |
| Designers | 박정우, 이원탁, 박성원 |
| Main issue | - 얼굴을 때리는 행위 유도 방법<br>- 음수대 작동 버튼 테스트<br>- 배선 및 펌프 연결 |
| Project Image |  |

**Figure 3. Self-reports of the Slap-on-My-Face design.**

Next, we conducted user observation. We observed the designed products being used in a university hall. Instructions of how to use the design products were not given to the users. We observed and recorded 251 users on video who used the Gas-Stove fountain (80 people), the Hold-My-Hands fountain (75 people), and the Slap-on-My-Face fountain (96 people).

## Case 1: *Gas-Stove Fountain*

The team initiated their design project with idea development, followed by a study about the mechanism of gas stoves, a study mock-up preparation, a water pump test, the laser cutting of product parts, assembly, and a final test. The entire project was completed within two weeks.

### *Idea Development*

***Step 1:*** The underlying design idea behind this product concept was derived from the principle of *unconventional use* in Giggle Popper. The Gas-Stove water fountain idea was born from the idea of reversal. The participants wanted the product to look like a gas stove that should be gushing fire instead of water. The humorous aspect was realized by the idea of using a product with a familiar appearance in an unusual context. Participants brainstormed on how to effectively apply the *unconventional use* principle to their water fountain. Relying on the idea of cognitive incongruity, designers using this principle made use of the clash between visual appearance and product purpose. The participants conducted a detailed review of Giggle Popper and then decided to emphasize incongruity by maintaining parts of an existing gas stove in their design (e.g., levers, ignition switch, and metal grate (Step 1 in Figure 4; Figure 6).

***Step 2:*** After brainstorming and reviewing Giggle Popper, the student designers realized that the Gas-Stove water fountain could offer several operational aspects to users. The next humor principle they embraced from Giggle Popper was *unexpected function*. They retained the same operation of the existing gas stove (i.e., pressing a lever and turning an ignition switch to control the flame intensity). The participants applied the principle of *unexpected function* to create an intentional disconnection between the product's appearance and its functionality (Step 2 in Figure 4). By keeping the operation of the water fountain similar to that of a gas stove, users reinforced the humorous aspect of the concept.

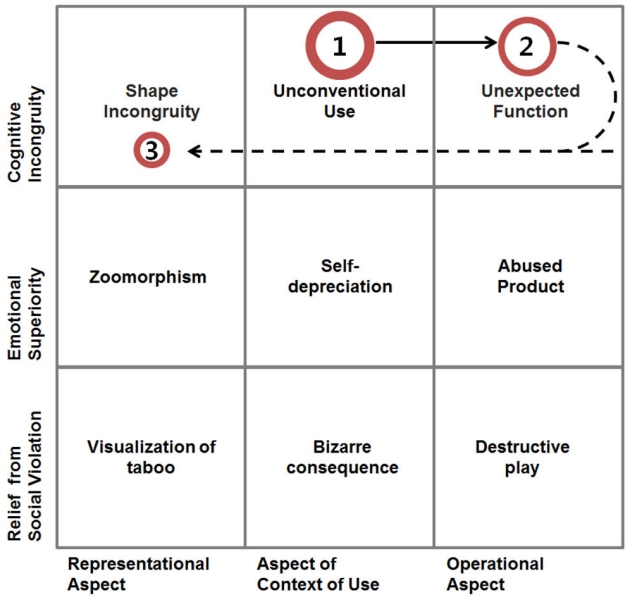
***Step 3:*** Regarding the representational aspects of the product, the participants explored various principles, including *shape incongruity*, *zoomorphism*, and *visualization taboos*. Although these principles were equally appropriate for the gas stove idea, they wanted to focus on the look of the Gas-Stove product using representational incentives in order to raise users' curiosity and motivation to use the product. Hence, they developed the idea of adding lighting and smoke effects (Step 3 in Figure 4). Thus, the stove was outfitted with a transparent housing through which users could see the inside of the product.

The ways in which the participants used Giggle Popper in the idea development of the Gas-Stove fountain design can be summarized in three points. First, participants elaborated on basic ideas by taking three aspects of humor into account: representation, context of use, and operation. Second, the participants reviewed each principle and deliberated about how to apply each one to the Gas-Stove, considering each principle independently as well as in combination. Finally, the participants considered various levels of humorous experience while asking themselves which aspects of humor were most applicable to their product idea.

### *Implementation*

After the idea development phase, the participants transformed the concept into a working prototype. The participants created the design prototype using the shape of an existing gas stove and the same methods of operation. They retained the operating mechanism of an existing gas stove and created the lever for the fountain using paper and foam (Figure 5).

The levers, ignition switch, and metal grate provided a familiar shape. The participants followed the principle of *unconventional use* in this phase. Based on the concepts developed in the idea development phase, they created a transparent housing and light-with-smoke effect on the cap to draw users' attention. The final prototype is shown in Figure 6.




| | |
|---|---|
| Step 1 | Looking like a gas stove by maintaining parts of an existing gas stove |
| Step 2 | Keeping the same operational mechanism of an existing gas stove |
| Step 3 | Adding lighting and smoke effects to raise users' curiosity |

**Figure 4. Idea development of the Gas-Stove water fountain based on Giggle Popper.**

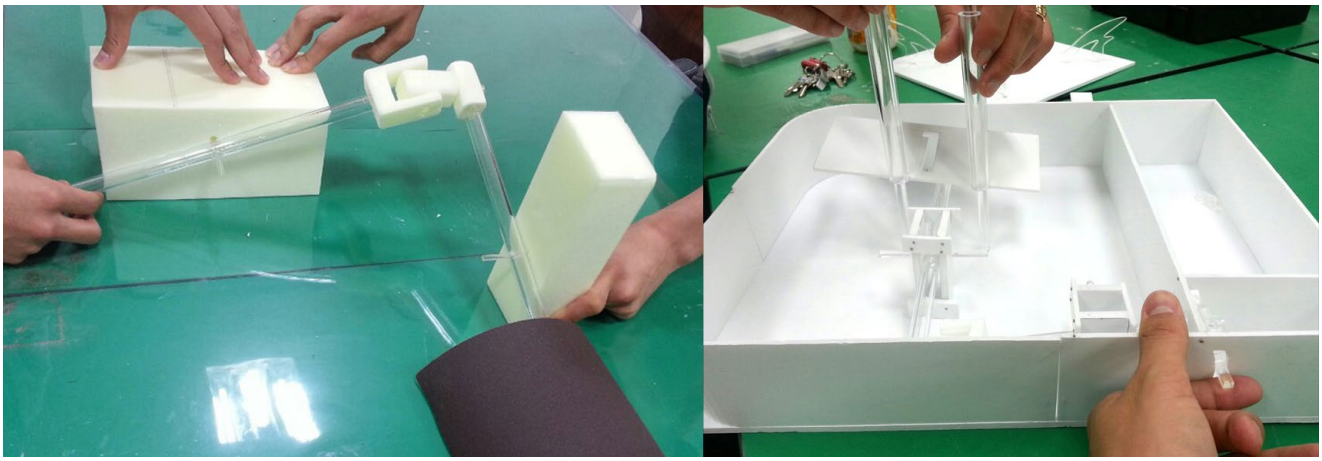


**Figure 5. Examination of the mechanism of the Giggle Popper inspired gas stove.**

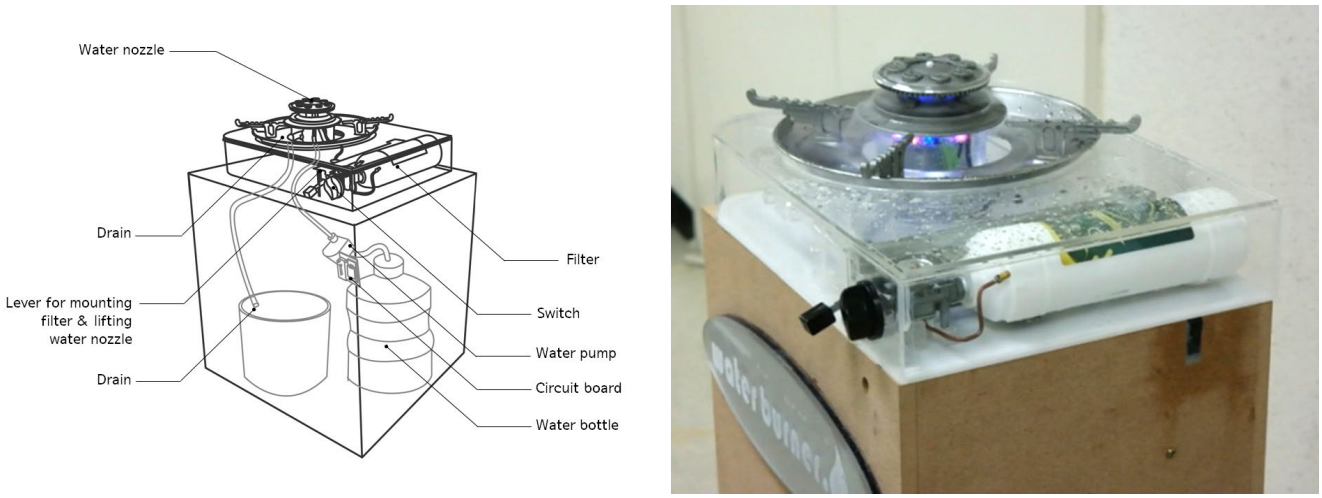



**Figure 6. Structure** (left) **and working model** (right) **of the Gas-Stove fountain.**

The Gas-Stove fountain was subsequently installed in a corridor of a university and its users were observed. Observation proceeded for five days, and 80 undergraduate students participated. Users were amazed by the lights and smoke effects, took a close look at the product, and expressed their 'surprise, satisfaction, amusement, delight, and admiration.' A number burst into laughter when the product was operated, with water gushing out from the gas stove (Figure 7).

**Figure 7. User observation of the Gas-Stove fountain.**

## Case 2: *Hold-My-Hands Fountain*

The *Lay-your-hands* concept (Figure 1) was given to the second team who further developed it into the Hold-My-Hands fountain. The underlying humorous idea was to take advantage of awkward situations where a user is confused about where to place his or her hands while drinking water. The participants used multiple principles of Giggle Popper throughout the idea development phase. The two-week period from idea development to implementation included idea sketches, a study on humorous poses used for operating the water fountain, a study mock-up, assembly, and painting.

### *Idea Development*

***Step 1:*** The participants developed their ideas using the principle of *self-deprecation*. This concept relies on a situation where a user shares his/her amusement with others and creates a new context for observers. The essential idea is that the product creates a situation where a user becomes a part of the funny appearance which is seen by observers. The participants were interested in the use of an articulated mannequin. The idea evolved into the Hold-My-Hands fountain, which entertains observers by forcing users into a comical pose. The chosen idea was that users needed to dance the tango to drink water (Step 1 in Figure 8). The two hands of the user were placed apart, making it difficult for the user to move. The participants' design required that users could only drink water by firmly pushing buttons placed on both sides of the fountain, which resulted in a tango pose.

***Step 2:*** While brainstorming with Giggle Popper, the principle of *destructive play* was used to enhance observers' positive experience. The participants suggested a scenario where the user would aim a laser pointer (Step 2 in Figure 8). This idea was derived by applying multiple principles, such as *self-deprecation* and *destructive play*. *Destructive play* is also associated with *relief from social violation.* The participants expected that users would be encouraged to engage in play that breaks social norms as they operated the product.

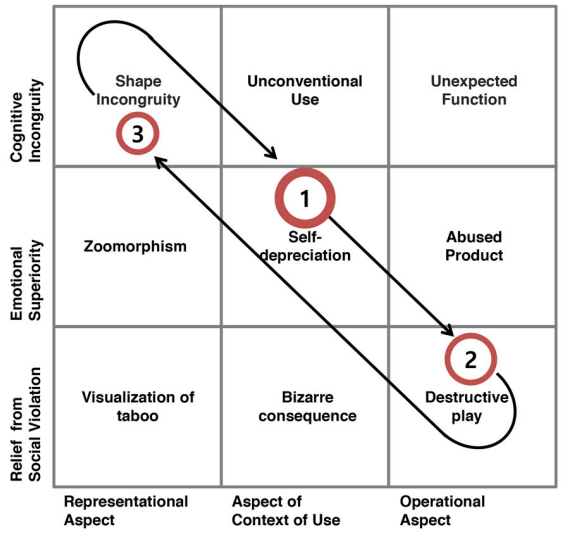
***Step 3:*** To increase the impact of humor, the participants made the water nozzle look like huge lips (Figure 10). While developing this idea, they applied the principles of *shape incongruity* and *self-deprecation*. Participants expected that the huge lips would draw users' attention to the product's appearance (Step 3 in Figure 8). Meanwhile, kissing products is an effective way to evoke an unusual context, which is a key factor in self-deprecation.

The participants frequently referred to Giggle Popper and deduced ideas to address users' positive emotions. As with the Gas-Stove fountain, three levels of humorous experience were considered separately and holistically. During the design workshop session for the Hold-My-Hands fountain, these three levels of humorous experience were incorporated into the product. The participants used *shape incongruity* for the *representational aspect*. *Self-deprecation* corresponded to the *context of use aspect*. Meanwhile, *destructive play* was directly related to the *operational aspect*. *Shape incongruity* and *self-deprecation* were adapted to the water nozzle, which was designed as a huge mouth. In addition, a laser pointer was utilized as a design solution to integrate the principles of *destructive play* and *self-deprecation*. The combined application of principles was used to maximize the humorous effect of the single design.

### *Implementation*

The participants built a working prototype after the design workshop, shown in Figure 10. Two buttons were placed in each hand to make the user operate the product with a firm grip (Figure 9). A laser pointer (Figure 9) was mounted for the index finger of the left hand to indicate when the user would be able to drink water. The lips were made of epoxy resin, painted red.

When the Hold-My-Hands fountain was installed, users laughed while looking at the huge red lips. They tried to find out how to use the Hold-My-Hands fountain as well as its purpose. Users urged one another to try the product, pushing each other from behind to perform the act of kissing, imitating the water-




| | |
|---|---|
| Step 1 | Offering a new context for observers by using a tango pose |
| Step 2 | Using a laser pointer to engage in play that breaks social norms |
| Step 3 | Shaping the water nozzle to look like huge lips |

**Figure 8. Idea development of the Hold-My-Hands fountain using Giggle Popper.**

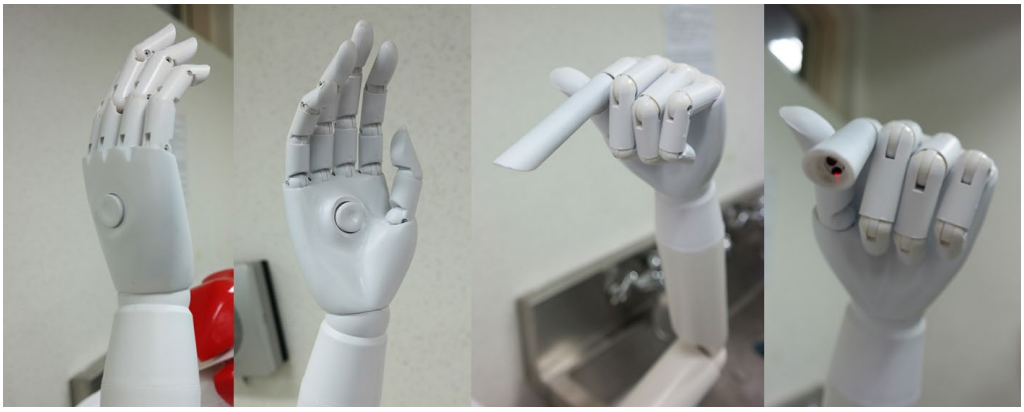


**Figure 9. Structure of the Hold-My-Hands fountain.**

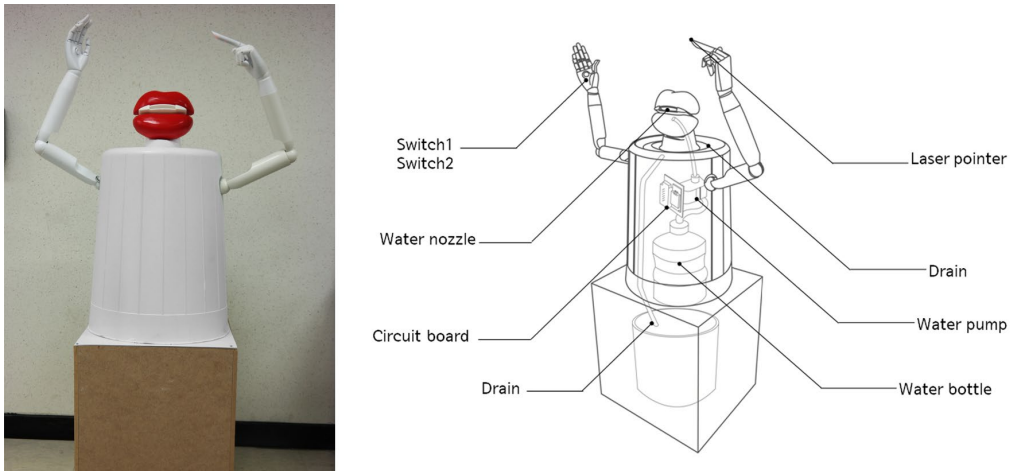



**Figure 10. Working model** (left) **and structure** (right) **of the Hold-My-Hands fountain.**

gushing sound, and generally sharing the experience. They laughed continuously from seeing the product to the moment when the water gushed from the product's lips. We observed 75 undergraduate students who used the Hold-My-Hands fountain during a four-day period.

## Case 3: *Slap-on-My-Face Fountain*

Designers started the Slap-on-My-Face fountain project from an idea sketch of facial expressions and shapes. They then studied how to make users slap the product and studied its operational stages. The team took 12 days to complete the idea development, and the study mock-up, and then to figure out the wiring, to test the water pump, and to create product parts, complete the assembly, and conduct a final test.

### *Idea Development*

***Step 1:*** The initial concept was closely related to the principle of *abused products*. For products based on this principle, users tend to feel sympathy. This concept banked on evoking an emotional exchange between the product and the user. The participants reviewed Giggle Popper and brainstormed the idea of *abused products*. To apply this principle, they placed buttons on both

**Figure 11. User observation of the Hold-My-Hands fountain.**

cheeks after making the product look like an animal face (Step 1 in Figure 12). They expected users to slap the cheeks to start the flow of water.

***Step 2:*** The participants considered how to make users slap the product without hesitation. They considered that users might hesitate to slap a realistic-looking face. To address this concern, they created a face with a larger, rounder shape (Step 2 in Figure 12). In this process, they used the principle of *shape incongruity*. The early idea also employed the principle of *destructive play* as the action of slapping a face is used as a form of play.

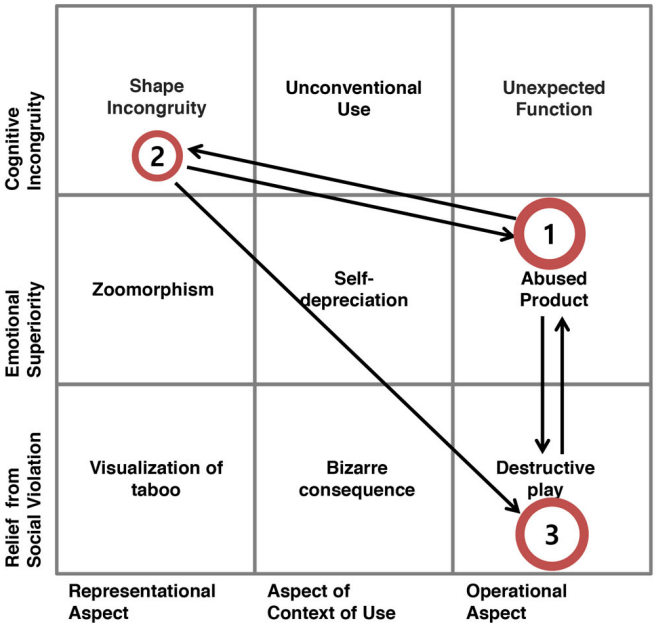
During the design process, one principle of Giggle Popper was substituted for other principles. The participants used *shape incongruity* to design the face in service of the principles of *abused product* and *destructive play*.

***Step 3:*** The participants decided to apply the principles of *destructive play* to the fountain as a concrete concept. First, the participants expected that users would need to take a cup out of a cup holder attached to the ears and place it onto the mouth of the fountain. The next phase of interaction would be that the user would have to slap the fountain's cheek to start the flow of water. The product would then spurt water from the nose and fill up the cup (Step 3 in Figure 12; Figure 13). The participants used Giggle Popper not only in composing the shape and appearance of the fountain but also in considering how users would interact with the product.

### *Implementation*

Participants created the face part with foam and the nose with epoxy resin. The face was painted, and the eyebrows and eyes were attached with fabric sheets to make the face more expressive. They made the cheeks out of sponge and cloth so that that part could bear repeated slapping (Figure 14).

When users faced the Slap-on-My-face fountain, they were observed stroking the round head, touching the face, or smoothing the cheek. They burst into laughter at the sight of the fountain and responded with glee during the using process. The observation took place over five days and involved 96 users. The participants were undergraduate students.




| | |
|---|---|
| Step 1 | Placing buttons on both cheeks |
| Step 2 | Designing a face with a larger, rounder shape to make users slap the product without hesitation |
| Step 3 | Attaching the cup holder to the ears and making the water spurt from the nose |

**Figure 12. Idea development for the Slap-on-My-Face fountain using Giggle Popper.**

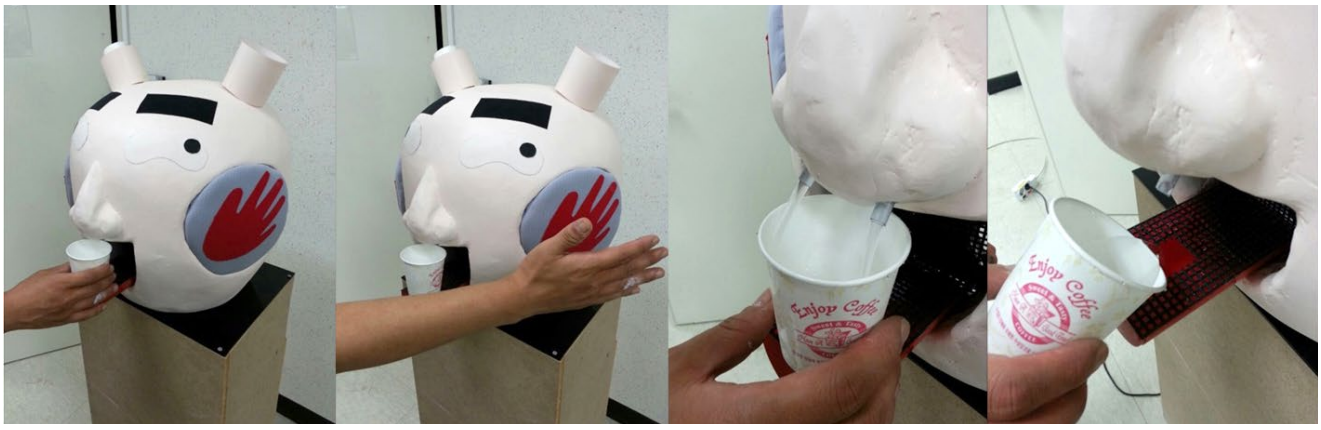


**Figure 13. Operation of the Slap-on-My-Face fountain.**

**Figure 14. Creation process of the Slap-on-My-Face fountain.**

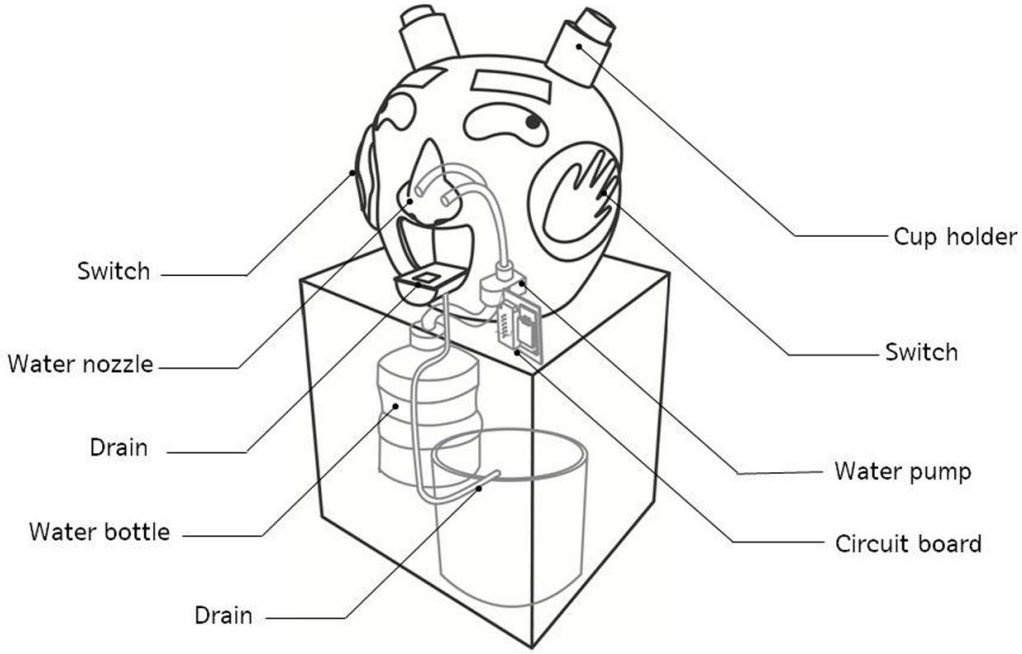



**Figure 15. Structure of the Slap-on-My-Face fountain.**

**Figure 16. User observation of the Slap-on-My-face fountain.**

## Findings

The results of the design workshop suggested that Giggle Popper aided in inspiring and improving ideas for humorous products, particularly with regard to their appearance, usage context, and interactive elements. During the design process for the three humorous products, the participants suggested solutions to deliver positive emotions based on Giggle Popper. They used Giggle Popper to construct the operation stage that offered humorous interactions. During the design process for the Slap-on-My-Face fountain, the participants embedded the principle of *destructive play* in the operation of the fountain (e.g., slapping a cheek to start the water flow from the nose). Thus, Giggle Popper has shown itself to be an effective method for creating design solutions, including interactivity. It can be used during any step of the design process from conception to development and implementation.

For each case design, we found different rationales behind the design decisions of the participants. The appearance of the Slap-on-My-face fountain included a large and funny face. We could see that the participating designers had intensive discussions on the 'shape of the face that one could slap without hesitation' through the sketch and study mock-ups until the shape of the product was decided. Participants said in the interview that it was important to come up with a design solution that allowed users to accept the principle of abusing a product in the Slap-on-My-Face fountain, and they gave a lot of thought with their team members to determine how to make the user's experience of water drinking humorous. Designers of the Gas-Stove fountain said that it was most important for users to recognize it as a conventional gas stove in order to apply the principle of unexpected function, which is the major principle of the Gas-Stove fountain. In the interviews, designers said that they tried to find a solution by analyzing and decomposing the structure of a conventional gas stove so as to design it to be similar to a gas stove not only in appearance but also in its method of operation. Designers said that with the Hold-My-Hands fountain, it was a challenge to make the drinking which took place look funny to everybody since the principle of self-deprecation was the main principle of the product. Among various ideas, the pose of dancing the tango was determined to be the most appropriate because it was easy to do while drinking from the water fountain. Designers carefully thought about the design element that created a humorous situation when observing the usage of the drinking fountain.

Giggle Popper helped the participants consider all three aspects of humorous experience in product conception: the representational, the contextual, and the operational aspects. In the ideation stage, the participants tended to suggest ideas based on one principle. When ideas became refined for the concrete prototype or product level concept, the participants considered every aspect of the humor experience. For example, in the design session of the Hold-My-Hands fountain, the participants used the principles of shape incongruity, self-deprecation, and destructive play in order to create a rich humorous experience. The principles of *shape incongruity* were applied to the huge lips shaped as a water nozzle to offer the representational aspect of the humorous experience, whereas those of *self-deprecation* were used for the idea of kissing the huge lips in order to present the contextual aspect of humor. In addition, the operational aspect of the humorous experience was constructed by using a laser pointer in the index finger based on the principle of *destructive play*. We learned that designers deduced ideas by focusing on a principle in the ideation stage, while they proposed design solutions by connecting one principle to another or by applying multiple principles at a time while considering the embodiment of an actual product. This suggests that the method of application of Giggle Popper varies according to the way a humorous experience is incorporated into a product, and during which stage (i.e., representational, context of use, and operational). Therefore, depending on the characteristics of a product and the humorous experience to be suggested to a user, decisions are made whether to use one principle alone or to add another to it.

The principles were chosen and applied according to the characteristics of the product to create a proper context for humor. In the design session of the Gas-Stove fountain, the designers decided not to apply the principles of shape incongruity, zoomorphism, or visualization of taboos, which belong to the representational aspect of the humor experience. They recognized that these principles were not appropriate for the construction of the key concept of the product, which was that it needed to look like a real gas stove gushing water. They opted to use representational incentives instead, such as a cap with light and smoke effects, to effectively produce an *unexpected function* and *unconventional use*.

Designers used Giggle Popper in various ways in the idea development session of the workshop. First, Giggle Popper lets participants suggest design solutions that inspire the use of additional principles. For example, while designing the Gas-Stove fountain, the participants consulted Giggle Popper to enrich the humorous experience. The existing uses of the gas stove were retained based on the principle of *conventional use*, which led to design ideas informed by the principle of *unexpected function*. Second, combined principles were applicable to humorous products. In the Hold-My-Hands fountain, the principles of *shape incongruity* and *self-deprecation* were applied to a water nozzle shaped as huge lips. Third, one principle could serve other principles. In the Slap-on-My-Face fountain, the product was designed with a large, round face based on the principle of *shape incongruity.* The shape of the face led the designers to consider other ideas based on the principles of *abused product* and *destructive play*.

These case studies showed that Giggle Popper served as a reference for designers to devise the humorous experience of a product, which included the appearance and functions of the product, and interactions with the product. Additionally, results showed that the material and color selection process of a working prototype was determined by designers' experience and intuition. Examples are the application of the lighting-effects to the Gas-Stove fountain, the lip-and-body-color selection for the Hold-My-Hands fountain, and the facial expression and cheek material chosen for the Slap-on-My-Face fountain. Therefore, we identified

that it is necessary for designers to consider suggestions and examples of appropriate materials and colors for each principle during the design process when they use Giggle Popper.

## Discussion

Designers used Giggle Popper in various ways in their idea development sessions. We observed that designers can effectively refine design solutions to be more humorous and to deliver positive emotions when they use Giggle Popper. The results also presented several issues for further investigation.

Giggle Popper was presented as a software application running on a tablet. The software application contained example products and descriptions for each principle. Participants noted in the interview that the process of designing with Giggle Popper is similar to the usual design process using references and images. However, they said that it was hard to compare multiple principles at a time or one principle with another because the app was mainly composed of guidelines and cases for each principle. The participants regarded the application helpful for spurring ideas. The browsing interface was simple. However, the feedback on the information architecture of the application was mixed. A number of participants wanted more examples, whereas others wanted more focused and deeper navigation. Meanwhile, there were those who preferred a simple presentation of example cases. Therefore, it would be helpful to carry out further investigation into more effective ways to present Giggle Popper at each stage of the design process.

We found that when participants reviewed all nine principles when they started their projects, if they could not come up with an appropriate solution, they moved on to the next stage of the design process. Therefore, it is necessary to supplement the methods provided by Giggle Popper, including the principle selection guide, in order to compare and define the optimum method to reflect each principle. In addition, we found the possibility that relationships among the nine principles in the case study can affect the results. Therefore, further study should take place to identify patterns for using Giggle Popper which combine an examination of the relationship among the principles, and the application of those principles, depending on the characteristics of a product.

It is necessary to provide appropriate supplementary cases and guidelines and to analyze major issues to be solved by designers in order to help them use Giggle Popper more effectively as a tool in the design process and to help them successfully construct humorous experience at each step of the process. To do this, it is necessary to construct a case structure that can appropriately present design elements, including shape, form, color, and material. For example, the use of Giggle Popper could be enhanced by providing designers with organized representative examples of how to select appropriate materials and colors for each principle in order to create humorous experiences.

Each principle of Giggle Popper has different guidelines and attributes. We observed that designers used two or three principles jointly to solve a design problem and one principle could trigger the use of other principles. Decisions about how to use the principles in combination, including the when and what for, remain difficult to explain. The principles might have existing relationships. Therefore, more study of the relationship between the principles and the way they can be combined is needed. Understanding the independence and interdependence of the nine principles will allow for more accurate and effective creation of humorous products.

Previous research has shown that user experience changes over time and with repetition of product use (Karapanos, Zimmerman, Forlizzi, & Martens, 2009; Woolley, 2003). One of the concerns with humorous products is the sustainability of the experience. It is not known if the humor effect will last after repeated use. Thus, the degree of sustainability, especially when it comes to maintaining a level of emotion, needs to be examined further. Repetitive use and its long term role should be considered in relation to user experiences and behaviors. In addition, we found that perceptions of what may be considered to be humorous can vary based on differences in the observers' gender, age, or cultural background (Martin, 2010; Wiseman, 2002). Therefore, it would be helpful to have a better understanding of how humorous products would be accepted in different contexts and by a variety of people. For example, the balance between something seeming *interesting* or seeming *ridiculous* should be different for humorous water fountains when they are used in an office versus in an amusement park. In the actual commercialization process, the humor of a product should be fully considered in the context of who the target users will be, and the environment in which the product will be used.

The water fountain was chosen as an ideation subject because of its diverse features: people may use a water fountain alone or in crowds, and water fountains may be installed indoors or outdoors. The water fountain is a suitable subject for investigating humorous product design. Additional research with different objects is necessary to investigate other applications of Giggle Popper. Although the current workshop verified the value of Giggle Popper with a water fountain, a comparison of the deduced ideas for various products would be helpful in verifying the universal applicability of Giggle Popper. It would be useful to explore design cases with other product categories, especially more intelligent everyday products, such as smart cars and smart home appliances.

Through user observation, we found that the patterns of users' responses and laughter vary depending on the products and circumstances. For example, users of the Gas-Stove fountain burst into laughter after operating the product and seeing the water gush out. In the case of the Hold-My-Hands fountain, the secondary users laughed louder than the users did. On the other hand, users of Slap-on-My-Face burst into laughter at the very sight of the product and laughed continuously while they used the product. Therefore, further study is needed to interview users who participate in the user observation phase of a research project, to analyze the pattern of user responses, and to find out the relationship between user responses and the principles of Giggle Popper, which in this particular case involved three products.

## Conclusion

Humor is one of the most effective means of encouraging positive interaction among people. Although designers acknowledge the potential of humor for design, there is a lack of knowledge about the methods of employing humor in the design process. The present study illustrated that Giggle Popper can be an effective design aid playing various roles in the design process. The results suggest that in the ideation stage, Giggle Popper was useful for stimulating new ideas and exploring new levels of experience. Giggle Popper was used not only for developing ideas but also for checking their suitability. We found that designers choose and apply a number of principles with regard to the desired concept and features of an intended product in order to create associated humorous experiences.

Giggle Popper helps designers to consider representational, contextual, and operational aspects of humorous products and helps them to create humorous products in terms of the products' appearance, context, and interaction. In addition, we found that each principle was used interchangeably and each principle could support the others.

In terms of future research, it would be interesting to investigate the way in which designers use different design processes to create different humorous products using Giggle Popper. One aspect to examine would be the way context affects the development of humor, as seems to be the case in this piece of research. In addition it would be helpful to evaluate the real-time interaction of people with humorous products produced using Giggle Popper. An evaluation of the interactions of people with humorous products would shed light on what aspects of design and design practice seem to be most effective.

Our study investigated the way Giggle Popper was used to design humorous products, focusing in particular on the design of water drinking fountains. This work contributes to the current knowledge about the design of products and interactions with them that provide positive user experiences. It guides future research about how to design products which incorporate humor and how to include humor in the design process.

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