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THE CREATIVE INNOVATIVE RESEARCH AND DEVELOPMENT OF THE SURROUND CEILING FAN AND LAMP

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ABSTRACT

Based on the concept of innovative design, this study developed a product with the functions of a ceiling fan and a lamp. The purpose of the innovative research and development was to resolve the problems of the current products and improve their appearances, in hopes of, with improved functions and enhanced aesthetics, creating the warm feeling of home and facilitating interactions among family members, to serve the goal of the innovative research and development of the product.

Keywords: Ceiling fan, Lamp, Innovative research and development, Product appearance.

1. INTRODUCTION

Creativity usually refers to the ability to create novel things, ideals, or results. Its characteristics include properness, meaningfulness, value, and usefulness. People with creativity have personal qualities such as being willing to take risks, being independent, not bending to public opinions, non-traditional words, deeds, and thoughts, and being flexible.

The principles of creative thinking are: (1) breaking through traditional thinking, (2) giving up perfect logical inference, (3) changing awareness, (4) never denying non-workable concepts easily, (5) listing two unrelated concepts at will and then looking for a relationship between them, and (6) coming up with new ideas in feasible thoughts [5].

2. LITERATURE REVIEW

Creative thinking teaching is a teaching method of a teacher teaching through course content and planned teaching activities in a supportive environment to inspire and encourage students' creating behaviors. In other words, a teacher applies creative thinking teaching strategies to his course, so that his students can have a chance to use their imagination, for the purpose of improving students' sensitive, smooth, flexible, unique, and precise thinking capability.

Teachers should (1) encourage students to use their imagination to improve their creative thinking capability; (2) center learning activities on students as main subjects instead of taking all the time of teaching activities; (3) pay extra attention to provide a free, safe, and harmonic environment and atmosphere; and (4) focus on developing students' interest and encouraging them to express their thoughts while tolerating different opinions instead of making quick judgments [3].

Regarding implementation, what teachers should consider include: (1) providing a diversified, open, and supportive environment; (2) accumulating knowledge base for the purpose of coming up with new ideas; (3) providing practicable, interesting, and fun activities by combining creativity and life, to improve students' ability to resolve problems; (4) teaching thinking skills so that students can blend into curriculums naturally; (5) focusing on both divergent and convergent thinking, and both creative and critical thinking; (6) team learning, cooperation, and exchanging different ideas; (7) combining family and social resources and integrating diversified intelligence development; (8) adopting multiple assessment so

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that creative ideas wouldn't slip away; (9) creating new ideas while also taking creativity theories into consideration; and (10) improving teachers' introspection in teaching and students' meta-cognition [3].

Learning motivations are the motive power behind learning. Students with strong learning motivations can overcome difficulties with willpower. Teachers can stimulate students' learning motivations through external inducements. Methods which can be applied include: (1) inspiring learning motivations in a teaching situation; (2) maintaining curiosity about learning contents; (3) using various teaching media; (4) role playing or imitation; (5) group competitions; (6) encouraging students to move toward pre-defined goals; (7) giving every student an opportunity to succeed; and (8) offering immediate feedbacks. Also teachers can make use of praises, teach students to reward themselves, or reward the student with the most progress to increase students' learning motivations. However, differences between/among students must be considered [1].

Teaching is a process of an activity in which both teachers and students participate. Teachers apply various methods, based on pre-defined goals, to gradually teach students in hopes of students' learning behaviors changing in a positive way with their teaching, to achieve their teaching goals. However, in the educational environment in Taiwan, the most commonly adopted teaching method is narration, without sufficient interactions between teachers and students or enough diversity in evaluation methods. Therefore, education and systems have become stiff, making it harder to motivate students to actively learn. Thus, more space for creative development and imagination should be given in interactions between teachers and students. And students' different opinions and ideas should be accepted [3].

3. INNOVATIVE PRODUCT DESIGN

Creative thinking ability is a combination of some characteristics of humans, including sensitivity to questions, smoothness and novelty of concepts, flexibility of thinking, integration capability, analyzing capability, complexity of concept structures, and evaluation capability.

The methods which can be applied include: (1) brainstorming: aiming to encourage team members to come up with as many ideas as possible without making judgments; (2) graphic organizer: presenting knowledge through visualization, helping learners to structurize information, efficiently organize knowledge they've received, and activate their background knowledge and structures; (3) discussion: with diversified forms, such as Phillips 66, tutorial group, task group, and panel discussion; and (4) six thinking hats: using hats of 6 different colors (white, red, black, yellow, green, and blue) to represent humans' different thinking strategies in problem solving [2].

In psychology, the colors which represent passion are red and orange. They are full of enthusiasm and power, giving an energetic impression. The colors of romance are pink and lilac, giving a gentle and graceful feeling. The colors of happiness are orange, yellow, and carmine, which can create emotions of excitement and merriment. They can make people feel free and can bring a sense of rhythm. The basic color of cuteness, showing honey-like sweetness, giving a romantic impression, and making people feel happy. The colors of coolness are blue and green, making people calm, away from hotness, cool, and comfortable. The colors of leisure are yellow, green, and light orange, giving a sprightly, natural, and free impression, making people feel relaxed. The colors of elegance are silk color and lilac, showing value and delicacy. The color of solemnness is dark brown, giving a serious, classic, and quality impression. The colors of warmth are ivory-white and almond, giving an impression of fluff, softness, friendliness, and comfort. The colors of loneliness are black and gray-blue, giving an impression of silence and subtle grace, showing the senses of solitariness, independence, and oppression. However, they can easily catch people's attention [4].

The researcher of this study spent her after-class hours to direct her students to come up with ideas for innovative products. The teacher collaboration method was adopted for cross-school joint guidance. Through the internet technology of video conference, the students could discuss their works with the teachers and make modifications. This way, the students could perfectly present their inspiration of creativity and their product structures.

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4. DESIGN RESULTS

When using a traditional ceiling fan, the direction air is blowing is usually toward the sides of the fan instead of downward. When using a ceiling oscillating fan, it is impossible to blow air toward multiple directions at the same time. And the range of blowing is usually small or under the fan. The size of the fan is also limited. In this respect, this study aimed to resolve the above mentioned problems by integrating the surround concept of a lamp into the innovative design of a ceiling fan product.

The overall style is a high-tech style with simple geometric shapes to present the simple aesthetics of the product. The transparent acrylic material makes it possible to see the beauty of the delicate structure inside the fan, creating a strong contract to the aesthetics from the hard and solid metal material. As a result, the lamp fan is visually more attractive (Figure 1 and Figure 2).

Figure 1. Innovative product design results-design form 1

Figure 2. Innovative product design results-design form 2

5. CONCLUSIONS

The most important feature of the innovative product design for the surround ceiling fan is that, with the pyramid lampshade under the fan, the ceiling fan can blow air uniformly to all around the fan. This way, the problem with traditional ceiling fans of a rather small blowing range and the problem with ceiling oscillating fans of blowing air toward only one direction can be resolved.

The lighting design for this surround ceiling fan and lamp is a double refraction design, so that the light rays from the very bright LED lamp can become softer, which is better for users' eyes. This product requires several small low-power LED bulbs instead of one single high-power LED bulb or an incandescent bulb. With the heat radiation design at the bottom, the heat from the bulbs can be minimized.

In the aspect of the structure, the parts used include: (1) a metal suspension rod: used to ensure the stability of the ceiling fan; (2) a fan motor: consistent with the mechanical structure; (3) a metal support: connecting the protection cover and the main body of the product; (4) an acrylic

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protection cover: preventing direct contact of users' hand to the fan blades; (5) a metal main body of the fan: with the diameter of 400mm; (6) a pyramid diversion shade/lampshade: directing air blown from the fan toward all around the fan and reflecting the light from the LED bulbs; and (7) LED bulbs and bulb sockets: 1W LED bulbs with a heat radiation design at the bottom.

Users can, according to their preference, choose the color of the shell of the fan and that of the protection cover. They can also purchase additional protection covers of different colors and exchange the protection cover of their fan to fit different seasons or home environments. The surround fan is controlled through a mini remote controller. There is also an option of installing a switch on the wall. The rotation speed of the fan and the brightness of the lamp can be adjusted by users. The design of the surround fan is small and exquisite with rich colors. This all-directional product is perfect for a living room, a dining room, or a bedroom.

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