



Creative Conceptual Study of the Blind Navigation Cane

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Abstract This paper aims to guide students through the educational journey of a creative thinking and design methods course, encouraging the application of creative thinking techniques and sparking innovative ideas. Through collaborative group work, students propose improvements and designs for innovative products, aiming to create solutions that are more convenient or safer than existing ones. Furthermore, following the presentation of students' creative ideas, blind navigation cane designs are evaluated based on criteria of innovativeness, novelty, practicality, and future applicability. Selected designs are then submitted for patent application in the Republic of China and participate in the International Exhibition of Inventions in Europe. The review process resulted in the acquisition of a new patent and a gold medal award.

Keywords Creative Thinking, Innovative Products, Creative Ideas, Blind Navigation Cane.

1. Introduction

Despite having intact limbs, individuals with visual impairments face difficulties in walking safely and require assistance for various daily activities. The white cane emerged in response to this need. Recognizing the dangers of busy streets and bustling intersections, this paper addresses the crucial issue of how blind individuals can navigate roads safely.

It is not easy for visually impaired people to cross the street. If a white cane is equipped with GPS and a receiver, turning on the mobile phone's Bluetooth and connecting it to the earphone can launch its navigate function. The device can also identify the signal of traffic lights, and the user can listen to its instructions without being disturbed by other sounds. It is also equipped with luminous support at night, making it safer for the visually impaired to walk.

2. Literature Review

Researchers have investigated the needs of individuals with visual impairment, and the findings indicate that addressing the fundamental issue of vision and providing assistance are the most crucial priorities for the visually impaired [2]. Addressing the technological challenges posed by visual impairment is a formidable task when the goal is to enhance the quality of life for individuals with limited or no vision [1].

The research aim was to evaluate participants' attitudes towards the acceptability, usability, and preferences of technology-driven mobility aids in their daily lives [3]. The smart belt and stick are innovative gadgets designed to aid individuals with visual impairment in achieving self-navigation and ensuring safe mobility [4].

3. Creative Thinking and Design

The course begins with the instructor providing lectures on relevant theories such as creative thinking and design methods. Examples are then presented for teaching and discussion, allowing students to observe and learn, and subsequently generate their own creative ideas. Furthermore, students have the option to form groups based on their individual interests, with a maximum of three members per group. However, if there are special circumstances, students may also choose to work individually.



The course progresses in accordance with the teaching and learning process. By the ninth week, students are required to submit a poster design (A4) that includes the creative theme, school name, designer's name, creative concept, and contextual usage imagery. This submission is followed by an oral presentation. In the eighteenth week, students are expected to present a revised version of the creative poster design along with a short creative idea video (1 minute).

4. Design Results

Based on criteria of innovativeness, novelty, practicality, and future applicability, the instructor in this paper selected the student project on the blind navigation cane for patent application. The project also participated in the International Exhibition of Inventions in Europe. The outcome was the acquisition of a new patent in the Republic of China and a gold medal award, as shown in the figure 1.





盲人導航杖
Navigation Stick for the Visually Impaired

林登輝、黃佳惠、阮詒庭、吳詩婷
Rui-Lin Lin, Jia-Hui Huang, Yi-Cour Nian, Shi-Ting Wu

盲人過馬路非易事，導盲杖若加裝GPS與接收器，手機開啟藍芽並接上耳機後，即可為其導航，也能知曉紅綠燈訊號，其指示而不被其他聲音干擾。夜晚亦有夜光輔助，使盲人行走更安全。

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建國科技大學
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中華民國專利證書

新型第 M644760 號

新案名稱：盲人導航杖

專利權人：建國科技大學

新發明人：林登輝、黃佳惠、阮詒庭、吳詩婷

專利權期間：自 2023 年 8 月 11 日至 2032 年 12 月 17 日止。

上開新發明依專利法規定編譯成式書表取得專利權行使專利權如未提示新發明技術報告不得進行警告

經濟部智慧財產局 局長 **廖承威**

中華民國 112 年 8 月 11 日

Figure 1: Design Results

5. Conclusion and Recommendations

This paper explores creative concepts to address the challenges faced by visually impaired individuals when crossing roads. By incorporating GPS and a receiver onto the white cane, along with connecting a mobile phone via Bluetooth to headphones, blind individuals can be effectively guided and informed of traffic signals without being disrupted by surrounding noises. This allows for accurate and safe road crossings. Additionally, the use of luminescent aids ensures safer pedestrian interactions even during nighttime.

For future endeavors in conceptualizing and designing related creative ideas, the development of an intelligent AI cane product can be employed. This innovation aims to make significant contributions to individuals with

disabilities, enabling visually impaired individuals to navigate with enhanced safety and convenience. Moreover, it promotes mutual respect and consideration between motorized vehicles and pedestrians, further reinforcing safety in day-to-day life.

References

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