Typography and Children

Your Paper Title

Designing a Novel Tai Chi Practice Experience by Integrating New Digital Typefaces Design and AR Technology

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Abstract: This presentation aims to introduce how researchers transferred their pilot research outcome on Taichi Characters design to real learning and teaching platform through technology advancement including (i) Animated 2D and 3D Chinese Character typeface design, (ii) A.R. (augmented reality) 3D Chinese Character development.

Key words: TaiChi, Chinese Characters, New Chinese typeface design, A.R.

1. Introduction

This research project is a design and user-orientated research project which aims to design and provide a new practical Tai Chi learning material - user-friendly handbook (printed & digital format) for the elderly. This project is the extension from our pilot research "New Tai Chi Chinese Typography System", with Internal Research Grant from Committee on Research and Development, EdUHK (2017-2019). Our pilot study investigated the effects of "New Tai Chi Chinese Typography System" (NTCTS) on the learning of Tai Chi (i.e. memory process and self-efficacy) of elders in Hong Kong. In our pilot research, A randomized controlled trial was carried out in a sample of adults aged 65 years or older. Two groups were divided, namely Group A (n = 6) and B (n = 5). All the participants were asked to participate to a course of Tai Chi learning in the presence of NTCTS. During the course, the performance of the participants will be recorded through observation of the instructor, while several traits (Aesthetic Emotions[1], Self-efficacy[2] before and after the course) of the participants will be assessed in different time in order to investigate the effect of NTCTS in Tai Chi learning. Generally, the mean level of self-efficacy has enhanced by +1.91 after attending to the course of NTCTS. The enhancement is especially obvious for beginners, which group of participants has enhanced +3.50 (p[3] = .013 < .05) in their SEQ[4] . However,

no statically significant relation is found between the enhancement in self- efficacy and ASETHEMOS. For participants of experienced learners, no statically significant enhancement in self-efficacy is found after the course. Then, through observation learning, memory consolidation and self-efficacy enhancement are found among beginners. Despite lack of statistic evidence, the positive feedbacks from all the users may support the system to have further development. Finally, our research team has collected very useful information and data form the workshop and we have modified and suggested this research project for further tai chi learning and teaching in the future. This research project therefore, has first developed a series of new animated 2D Chinese character typefaces and has created a new visual experience of Tai Chi typography whose style is close to human hand-writing, which is one of the major innovative directions, distinguishing itself from the traditional computer-based Chinese typeface. Moreover, the researcher also worked closely with different software programmer, graphic and typography designers in the creative industry and have explored further the possibility of A.R. and user-interface design experience. Furthermore, the research team has suggested a brand new user-friendly and easy-memorized visual Chinese typeface system for Tai chi practitioners and new learners. This project advocates the adoption of a new learning method to provide practical learning tools and learning models to people of different abilities and needs from an artistic and cultural perspective. In addition, the research results also provide knowledge for the study of the relationship between Chinese calligraphy and technology and give a certain direction for the implementation of comprehensive visual art education.

Aims:
- To transfer previous research results to a real learning and teaching platform through technology advancement including: (i) animated 3D Chinese typeface, (ii) AR (augmented reality) 3D Chinese typeface; and (iii) interactive vocal navigation (Chinese typeface);
- To further develop a brand new user-friendly and easy-to-memorize Chinese visual typeface system for Tai Chi practitioners;
- To explore new design possibilities and varieties of formation in the new Chinese Tai Chi typeface system;
- To create novel interactive and immersive learning and teaching tool kits;
- To cultivate traditional Tai Chi values closer to youngsters (who may have already lost interest in and connection to Tai Chi tradition) through up-to-date digital media technology; To provide a win-win solution to: (i) narrow down barriers between the

elderly and technological development; and (ii) build connections between youngers and Tai Chi tradition through technology.

Novel Chinese Typographic style:

In this innovation work, we have achieved a lot in different aspects. First, we have developed 15 pieces of new animated 2D Chinese character typeface (文字款式設計) and have created a new visual experience of Tai Chi typography whose style is close to human hand-writing. This is a major innovative direction and break through of our research project, distinguishing itself from the traditional computer based Chinese typefaces. Moreover, we worked closely with different graphic and typography designers in the industry and have explored further into the possibility of new visual experiences (Fig. 1).
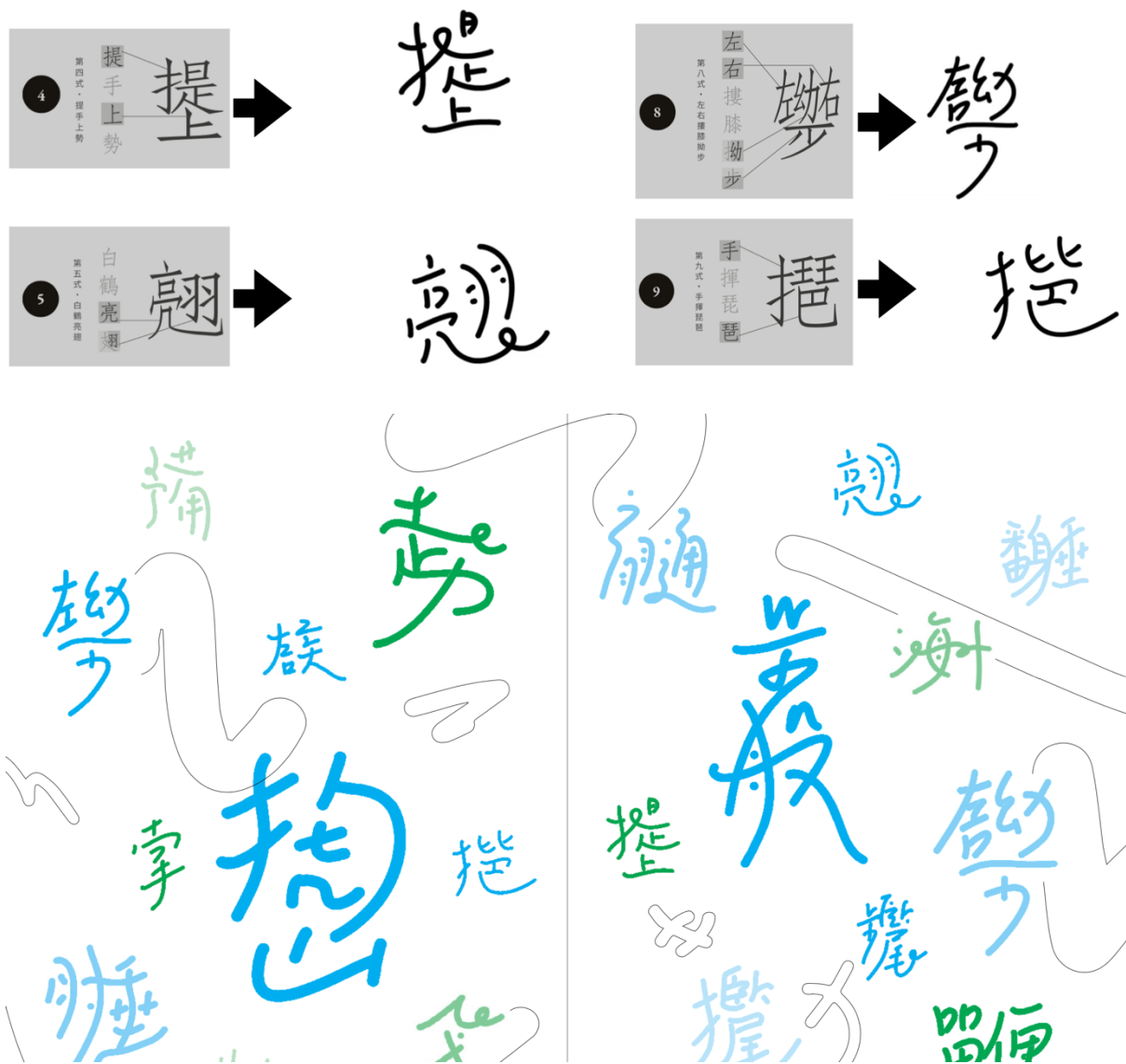

Figure.1 The 20 handwritten Tai Chi compound characters competed in this reseaen.

Novel Chinese Typographic 3D modelling design

We have developed a new texture for the Chinese animation characters. This provides a new learning experience to users and helps arouse their interests in learning Tai Chi through this app. The most challenging thing, however, is to develop a mechanism to transform 2D animation to 3D animation that can be viewed in 360 degrees (Fig. 2).

Figure.2 Tai Chi compound characters AR App under different backgrounds.

New direction to read Chinese Tai Chi Characters

Our team have successfully designed the animation Tai Chi characters in such a way that are as close to Tai Chi practice as possible, with reference to the real motions of Tai Chi practice in reality. In addition, we tried to build continuity and connectivity between the animated Chinese Tai Chi Characters when they first appear and at the end of the same animation. Its objective is to develop continuity in the animated Chinese characters similar to the rhythm of Tai Chi practice. This is also a new realm in the direction of our

team's creation of animated Chinese characters. In future, we will continue to explore the accuracy and diversity of animated Chinese characters (Fig.3).

Figure.3 Handwritten Tai Chi compound characters AR App.

Research outputs

1: Animated New Tai chi Chinese Characters/ Typefaces:

A set of new set of animated Tai chi Chinese characters (as new Typefaces (2D & 3D) which can be viewed in mobile & tablet computer for widely learning usage. Animation gift is a graphics interchange format, which is an image file format commonly used for images on the web and sprites in software programs. The reason using GIF format, technically speaking, it is this a very easy and quick leaning tool which can be advantageous when loading images online as they can load quicker without losing its quality. Furthermore, it is efficient for quick message delivery in visual experience, which also help in providing a more professional look to a particular website having animation over a varied background. Moreover, it conveys messages better and effective. It can show movements and emotions that a regular image can't possibly do. Therefore, animated GIF can be useful for making tutorial animations that can enhance the experience. Take note that elderly viewers can

easily be amused with animations, so it can really make them want to pay attention to details.

2: Augmented reality (AR) New Tai chi Chinese Characters/ Typefaces:

An interactive learning experience of a real-world environment where the 3D & moving Chinese characters (as a virtual 3D object) that reside in the real world are enhanced by computer-generated Augmented reality (AR) will be developed. We will examine the possibility to superimposes an image onto a user's view of the real world and enhances it with sound and touch through augmented reality (AR). Its function is not only blurring the lines of reality, but the learning outcomes will be improved through increased engagement and interactivity. Augmented Reality (AR) in such kind of physical learning and teaching activity features aspects that enhance learning of abilities like problem-solving, collaboration, and creation to better prepare students for the future. VR also create win-win beneficial result: on the one hand, it maximizes elderly players' ability to spend their time learning curricular subjects while minimizing the time spent learning how to use the new tech; on the other hand, such new tech experiences could bring kids' interest in learning this so call traditional cultural – tai chi practice. When combined with assignments involving teamwork, AR similarly helps provide new opportunities for students to learn how to communicate and collaborate with one another. It could potentially also be the same technologies they will use in the workforce later on.

Deliverables

On individual level, it enables individual participants to build and enhance knowledge and skills; and learn to adapt to the changing processes. On social level, this new AR App supports the establishment of a more interactive, educational and creative learning experience, and enhance public/ social capabilities to meet the needs of different groups/communities. Through this opportunity, it can also provide an interactive, educational and creative staff training environment, improve overall ability and effectiveness, and provide positive and active preparation for future sustainable development. The results of the design and research process will provide innovative ways for learning centres or curatorial projects to interact with elderly, ethnic minority communities or learners with special needs to respond to their ability needs and promote creativity, flexibility and higher level of participation. In addition, participants are not alone in their learning process. After completing the workshop, there will be an exhibition and lectures where they will have the opportunity to share their learning experience and creative works. Friends and family of the participants will also be invited to attend and

everyone will participate in different ways.Through learning together and communicating with each other, we can better understand the needs of Tai Chi participants and promote trust, thereby enriching an inclusive learning experience. By continuously fine-tuning and optimizing the AR system and 3D Chinese character, coupled with appropriate technical support and training, participants from different groups will be more likely to master the use of this tool, including the visually impaired, the ethnic minority communities, learners with other impairment, children and even the elderly.

Professionals from different sectors, educational institutions, community organizations are invited to participate in this project for interdisciplinary participation, discussion and collaboration, research results of which may stimulate further development and innovative ideas, so that different fields such as in medicine, design, art or social welfare can benefit. This project advocates the adoption of a new teaching method to provide practical learning tools and learning models to people of different abilities and needs from an artistic and cultural perspective, and apply them to community education services. In addition, the research results also provide knowledge for the study of the relationship between Chinese calligraphy and technology, and give a certain direction for the implementation of comprehensive art education.

In addition to local education, we also plan to promote this learning tool to educators in other Chinese-or-non- Chinese speaking regions (such as Japan, Taiwan, Singapore, Europe and US, etc.). The initial plan is to introduce this learning tool to educators in the form of a press conference or an achievement sharing session to further deepen the understanding of Chinese character art and its history and culture by other Chinese speaking groups. Results of this project can also be used to share Chinese culture with children in other Chinese-speaking regions to achieve the purpose of cultural promotion. In order to ensure the sustainability of this plan and increase the reach of the target beneficiaries, we will promote and extend cooperation in the two online social platforms, that are currently widely used by the public, namely Facebook and Instagram, as the online promotion channels for this project. By setting up a Facebook page for this project, people can regularly publish the results of the project, such as Chinese character animations and teaching web pages so that people from all classes can understand the stories of Chinese characters through the Internet; at the same time, we can also create a social media platform which regularly announces the latest workshops and results to share meeting information to the public to attract more stakeholders to participate in activities related to this project.

In the future, our research team also looks forward to further the results by conducting user tests to refine the design, and in the future, Incorporating potential advanced digital applications: such as virtual reality and online demonstration workshops. The research team hopes that such outcomes will contribute to the expansion of the Tai Chi learning demographic, and provide practitioners of various levels an accessible, highly accurate learning experience. Immersive digital learning experiences could be designed for younger children – as a new leaner for our next step. In addition to creating participatory activities through our custom designed handbook, animated typefaces system, AR application etc. we also consider collecting vocal data of participants' comments/experiences as the foundational elements of a digital resource platform for educational and generative discourse on the topics explored. This could be developed into a growing online resource for relevant research and practice in both local and global networks. Bilingual system: For all content in the programme, we wish to reach different groups from the broader public and connect with global communities to encourage future research and collaborations. Therefore, both Chinese and English content will be delivered in the future, in order to expand and promote this new learning method to overseas.