Designing A Wearable Aided Device of Mobile Phone for Senior Citizens: Need Assessment and Pilot Study of the Prototype

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Objectives

Nowadays, more and more senior citizens use mobile phones for their daily life. However, the limited interactive screen of a mobile phone causes elders reading problems, preventing them from retrieving information via the Internet. The research teams therefore tried to design a wearable aided device. This poster reports results of the need assessment and pilot study of the prototype.

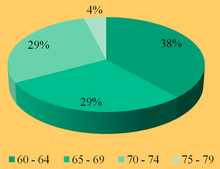
Research methods

As to the need assessment, the research team sent out printed questionnaires to all 30 students of 2013 Senior Citizen College in Taipei Medical University, exploring their information behavior of using smart phones and attitude towards adopting wearable aided devices. Based on the findings, the research team developed a prototype. It is a micro headset mobile video projector. It can be linked to the smart phone when needed and then projects and zooms in to any convenient viewing of objects. Then, a prototype test was conducted. Four elders were invited to test this device, and asked to provide suggestions and opinions about its clarity, comfort, distance, size, and weight. The collected feedback will be the reference for further improvement of the final device.

Mechanism of the prototype

Subjects	Conducing Time	Gender	Mobile phone type
A	Afternoon, 4/24, 2013	Male	Smart phone
B	Afternoon, 4/24, 2013	Female	Traditional phone
C	Afternoon, 4/26, 2013	Male	Traditional phone
D	Afternoon, 4/26, 2013	Female	Smart phone

Participants of the prototype test



Age Group (Questionnaire)

Findings

The results of needs assessment indicate that the participants of this study mostly held positive attitudes toward the prototype device. In terms of design, functionality exerts as the most significant factor. Furthermore, most of the participants felt satisfied with the projection distance and the image quality provided by the prototype. It's also revealed that a medium-sized and medium-weighted reading aid—that is, 4x6.5 centimeters and 40-60 kilograms—is considered as the maximum for practical use.

Smart Phone Usage Behavior

Question	Average
To me, smart phone is an indispensible part in my daily life.	4.4
I think the resolution of smart phones is important.	4.4
I want to have a reading aid to augment the practical use.	4.4
I'm satisfied with screen sizes of currently available smart phones.	4.0
To me, I have no difficulty reading texts presented on smart phones.	3.8
I'm used to using smart phones to surf the Internet and to search for information.	3.6
I'm used to using smart phones to watch video clips.	3.0

Attitudes towards classes-attached reading aids

Question	Average	Smart Phone Users	Traditional Phone users
To me, classes-attached reading aids, which allow users to project contents on smart phones, is appealing.	4.29	2.60	4.19
Resolution and image quality of such devices is important.	4.48	4.40	4.50
Comfortability of such devices is important.	4.43	4.40	4.44
Projecting distance of such devices is important.	4.29	4.40	4.25
Size of such devices is important.	4.19	4.20	4.19
Weight of such devices is important.	4.14	4.40	4.06

Analysis of Prototype Test

Projecting Distance & Resolution

- Subjects held positive attitude when contents were projected on the wall.
- However, negative attitude was discovered when contents were projected on a A4 paper, for such projecting method made them uncomfortable.
- Projecting on papers, which provides better resolution and image quality, is regarded as a preferable projecting method.

Size & Weight of Reading Aids

- In terms of the size, subjects claimed "the smaller, the better."
- In terms of the weight, subjects also claimed "the lighter, the better."
- A medium-sized (4x6.5 centimeters)& medium-weighted (40-60 kilograms) reading aid is considered the maximum for practical use.

User's Perceptions

- Generally speaking, subjects are fond of the concepts of glasses-attached reading aids and willing to own one for better using experiences.
- Suggestions provided by subjects include projecting techniques, privacy, texture, power system, binocular parallax, design, and so forth.

Conclusions

On the basis of the needs assessment, this study designed a Glass-Attached Reading Aid. The following prototype testing results laid the foundation for advanced modifications to the functionality as well as the appearance design. Lastly, A four-dimension questionnaire—including perceived usefulness, perceived ease of use, attitude toward using, and intention to use—adapted from Technology Acceptance Model (TAM) was conducted for a better understanding of the senior citizens' general perspectives on such reading aids.

For further information

Any questions, please contact *tzchiu@tmu.edu.tw*, *ijchiang@tmu. edu.tw*, *101155007@nccu.edu.tw*, & *hakilolo@tmu.edu.tw* for more information.

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