Use of video in research and teaching: Design-study of an application and a digital scoring tool for observing motor development

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Relevance
Low-threshold technology, like video, plays an increasing role in patient observations, and creates new opportunities. The same applies for use in research and teaching. However, privacy issues, secure store and capacity are challenges. The Alberta Infant Motor Scale (AIMS)\(^3\) is an observation instrument to measure gross motor development in infants. Currently, a new application was studied, namely using home-videos made by parents, instead of live observation of the infant.\(^2\) In this way data can be collected, independent of time and distance, for use in longitudinal research.

Purposes
(1) To design a supportive webportal, accessible to parents, that allows upload of videos, securely store and viewing by the researchers; (2) To design a digital scoring tool to teach scoring with the AIMS.

Approach
Within the GODIVA research project (Gross Motor Development of Infants using home-video registration with the AIMS), two E-health applications were designed by IT students, in collaboration with researchers and teachers, using ‘Design Science Research Cycles’.\(^3\)

Webportal
During the first half year of the GODIVA project, students designed a prototype of the Godivapp for smartphone and a webapp. The prototype was tried out in a pilot study, during which one of the IT teachers went on improving the app, based on parents’ and researchers’ feedback.

Outcome (1): The mobile app applies compression to the film, and allows to upload the video to a secured environment. Each film is individually encrypted. The app endured a crash test by ethical hackers. The webapp is applied now in two current studies, but is still prone to instabilities.

Scoring tool
In the second year of the project other students started to design a digital scoring tool. Besides, the videos of the parents who gave in addition permission for use in teaching, needed to be stored in a more accessible video-database. The students designed a tool for digital scoring linked to a video-database, based on the same back-end software, but with a complete different user-interface. The prototype was tried out in workshops. Students, teachers and pediatric physiotherapists commented on the use of it.

Outcome (2): The prototype of the scoring tool allows individual and group scores, and records accurately the viewing habits and the scoring of the student. All users were enthusiastic about the design.

Discussion
The limited storage capacity at the University was a bottleneck for the webportal, and had to be extended. The mobile app needs further development to shorten upload time.

Conclusion
Both applications are promising innovations for PPT research and education

Impact and Implications:
Feedback from users had a high added value for the IT students. In close collaboration during the research project common faults can be resolved. However, to realize this E-health application in clinical practice, a follow-up project is needed to refine technology, ease of use, and to focus on business- and service modeling. With the scoring data as a basis, the scoring system can be extended to an E-learning module for teaching analytical skills based on video-observation.

References:
- * Presented at the WCPT congress 2017, Cape Town
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