St. Pölten University of Applied Sciences

Learning Anatomy with Mixed Reality

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Author: Gregor Kurt Höblinger, BSc | First Advisor: Andreas Jakl, MSc

Introduction

- Virtual Reality widely used in education (Barsom, Graafland, & Schijven, 2016; Buchanan, 2004; Fiard et al., 2013; Sánchez, Barreiro, & Maojo, 2000; Selvander & Åsman, 2012; Sheth, Fader, Tergas, Kushnir, & Green, 2014; Wang et al., 2014)
- Physio-/occupational therapists not targetted
- Develop Mixed Reality Software with VARK (Fleming, 2001), Kolb (2015) and Yusoff, Zaman, & Ahmad (2010) in mind

Scientific Question

Can Mixed Reality be used as an educational tool for learning about anatomical structures and MRI images by physiotherapists and occupational therapists?

Methods

- Development of a Mixed Reality software
- Total of 24 therapists invited
- Response rate 75% (18), Drop out rate 8% (2)
- Tested with 8 physiotherapists and 8 occupational therapists
- Evaluated with a modified questionnaire based on ISO 9241/10[1]
- Descriptive Study

Fig. 1 *The developed software*
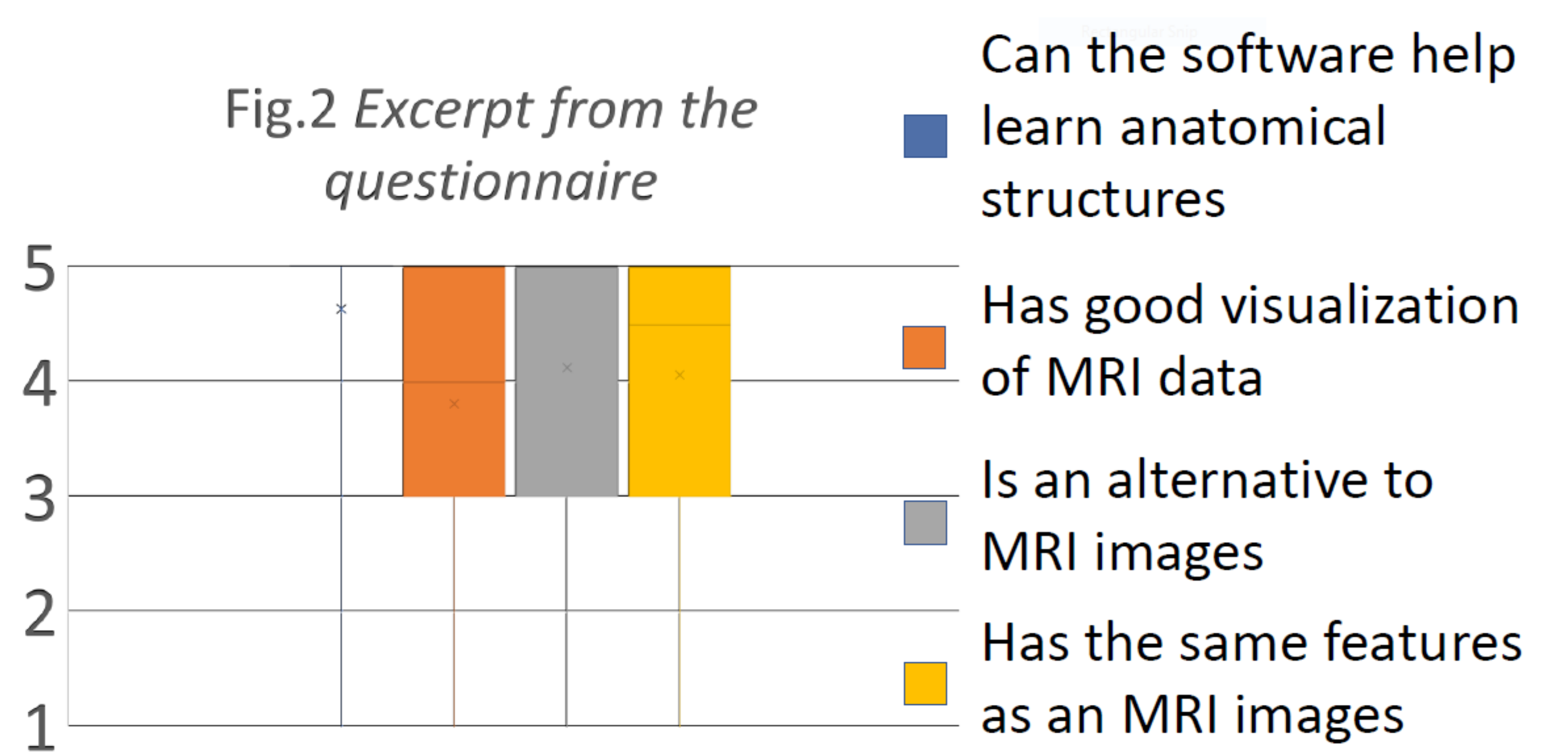
Features visible in this image
1. *rotate button*
2. *world anchor*
3. *descriptive text*
4. *structures in realistic colors*
5. *transparent structures*

Tendo musculus flexor
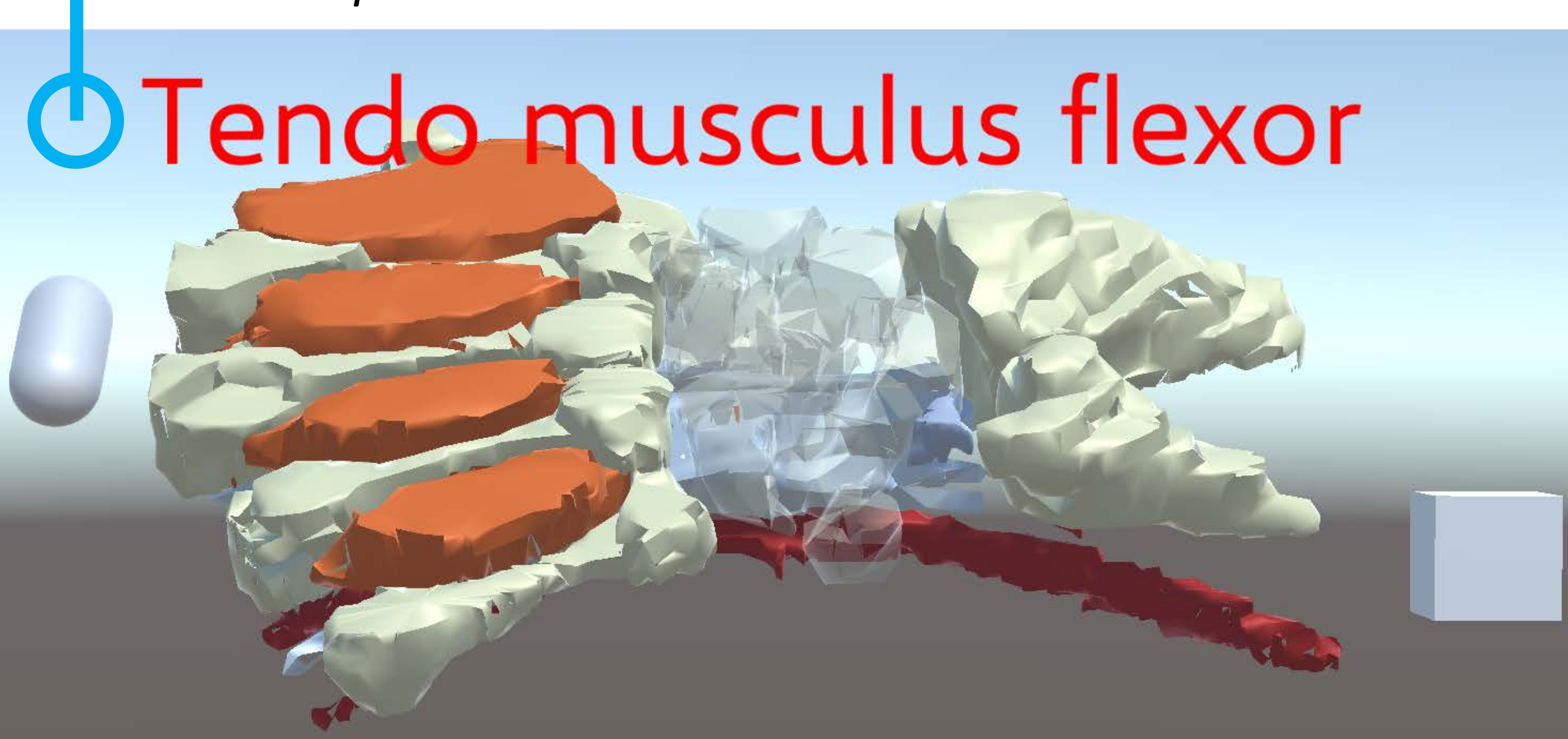
Development

- Microsoft HoloLens
- Written in C#
- Unity 3D for creating Mixed Reality environment
- Visual Studio for deployment
- 3D Slicer for model extraction from MRI images

Results

Fig.2 *Excerpt from the questionnaire*

Can the software help learn anatomical structures

Has good visualization of MRI data

Is an alternative to MRI images

Has the same features as an MRI images

1: Do not agree with statement; 5: Agree absolutely with statement

Conclusion

- Lacks self-descriptiveness
- Can assist in learning anatomical structures
- N=16 very low
- Better MRI image means better 3D model
- Controllers could improve interaction with the software
- Follow up study should implement analytics

Literature

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[1] https://www.iso.org/standard/16873.html