AALBORG UNIVERSITY, SCHOOL OF INFORMATION AND COMMUNICATION TECHNOLOGY

Problem Statement

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1 MOTIVATION

Robot assisted minimally invasive surgery (RAMIS) is used for many medical procedures. It allows for precision surgery and lowers the risk of injury while reducing recovery time for patients [History of minimally invasive surgery]. Traditionally the surgical performance has been measured in terms of the surgeons visuo-motor skills and dexterity, however a shift in the conceptualization of competencies is emerging in new literature (Safer Surgery book p 83). One of these competencies include teamwork in the operational theatre (source Hayley et al). A study concluded that 80% of incidents in anaesthesia related errors were preventable 75% of these were due to human error (Reported significant observations during anaesthesia: a prospective analysis over an 18-month period).
Lingard et al found that carried out a study with a focus on communication in the operational theatre and found that 36% of errors affected the teamwork negatively (Communication failures in the operating room: an observational classification of recurrent types and effects). From this study, five communication key points in the operational context was found: time, resources, roles, safety and sterility, and situation control.
Implementing a virtual environment in a training context among nurses have significant effects on overall teamwork along with teamwork subscales such as trust, team orientation, and backup (An Intervention to Improve Nursing Teamwork Using Virtual Simulation). One of the benefits of using a virtual environment is that trainees can attend the course off site.
To counter human errors, and to reduce critical events, simulation based training have become increasingly more popular over the years (The simulated operating theatre: comprehensive training for surgical teams). As the goal of simulated training is to involve all members of the surgical staff and to enhance their performance, R. Aggarwal suggests that the method also can be applied to other procedures such as robot surgery. This paper will ex-

plore the possibilities of simulating surgery training in Virtual Reality (VR) and document the effects on teamwork and performance.

1.1 Problem Statement

Based on the information above and with a focus on the impact of recent Virtual Reality technology, this paper aims to answer the following problem statement:

"How can virtual reality be utilized to improve the teamwork and performance of the operating team?"

1.2 Success Criteria

These will be made after we have had a group discussion.
Suggestions:
- have a working prototype - have a way of measuring teamwork - have a way of measuring performance - have a procedure for testing the above and plan statistical test