



# Karolinska Institutet

Department of Clinical Science, Intervention and Technology, Karolinska Institutet,  
Stockholm, Sweden.

## Go with the Flow To Facilitate Learning in Laparoscopic Gynecology

AKADEMISK AVHANDLING

som för avläggande av medicine doktorsexamen vid Karolinska  
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av

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## **ABSTRACT**

### **Background**

Education in medicine, particularly in surgical disciplines, is crucial since it affects patient safety. The learning process is dependent on individual abilities, prior knowledge and the learning environment. Evidence of simulators' positive impact on actual laparoscopic performance is mounting. However, less attention has been given to non-technical factors that might have direct effect on both simulated and real laparoscopic performance.

### **Aims of the thesis**

1. To evaluate if visuospatial ability, as measured by the Mental rotation test A, correlates with gynecological simulated laparoscopic performance (paper I)
2. To examine if self-efficacy and flow are associated with simulated laparoscopic performance (paper II)
3. To investigate if visuospatial ability, self-efficacy, flow and simulator training in LapSimGyn®, with or without mentorship with feedback influence performance in laparoscopic tubal occlusion (paper III)
4. To evaluate the effect of mentorship with feedback on simulated laparoscopic performance using both quantitative and qualitative methods (paper IV)

### **Materials and methods**

The participants in the studies were consultants or residents in obstetrics and gynecology or medical students. Validated tests, questionnaires and scales assessed visuospatial ability, self-efficacy and flow. Simulator training was conducted in LapSimGyn®. Laparoscopic performance was measured as duration of surgery in the laparoscopic tubal occlusions. Group interviews and inductive thematic analyses were used to evaluate mentorship.

### **Results**

This thesis demonstrates that visuospatial ability correlated with duration of surgery in early gynecological laparoscopic simulator performance ( $r: -0.64, p < 0.05$ ) as well as in early laparoscopic performance ( $\rho: -0.98, p < 0.05$ ), Papers I-III.

Simulator training appeared to enhance both self-efficacy and flow, Papers II & III. Moreover, the findings suggested that laparoscopic performance was improved by simulator training with, or without, structured mentorship and by increased flow and self-efficacy among the trainees. Duration of surgery was significantly shorter in the trained groups (median 340 s, IQR: 285-537), as compared to the control group (median 760 s, IQR: 573-1218), Paper III. Mentorship with feedback influenced laparoscopic simulator performance. Right instrument path length was shorter in the mentor group (median 3.9 m, IQR: 3.3-4.9) as compared to the control group (median 5.9 m, IQR: 5.0-8.1). Students in the mentor and non-mentor groups expressed the importance of getting support and being acknowledged, Paper IV.

### **Conclusions**

Simulator training, supportive mentorship with feedback, visuospatial ability, self-efficacy and flow are all tools or factors that have the potential to facilitate learning in gynecological laparoscopy and improve the surgical performance. Creating a learning environment with these factors in mind might therefore lead to improved patient safety.