LEARNGERS’ EMOTIONS IN SIMULATION-BASED MEDICAL EDUCATION

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BACKGROUND

• Medical education can be emotionally charged for many reasons; simulation-based activities in particular are designed to generate emotional reactions.

• However, few studies have concentrated on learning and emotions despite widespread interest on the topic.

• Especially, the role of academic emotions has been neglected.
THE PURPOSE IS TO FILL THE GAP THAT EXIST ON LEARNERS’ EMOTIONS

THE AIM OF THIS RESEARCH IS TO STUDY THE LEARNERS’ EMOTIONAL EXPERIENCES DURING SIMULATION-BASED EDUCATION
1) What kind of emotions do students experience before and after simulation-based education?

2) Which variables explain participants’ emotions before and after simulation-based education?

3) What kind of emotional profiles can be found among participants?
PARTICIPANTS

239 (122 MALES, 116 FEMALES)

MEDICAL STUDENTS (100), JUNIOR PHYSICIANS (119), HEALTHCARE PRACTITIONERS (17)

FROM 22 TO 39 YEARS OLD

MOST OF THEM HAD PREVIOUS EXPERIENCE OF SBME
RESEARCH CONTEXTS AND COURSES

RESEARCH CONTEXTS:

- GOODMAN SIMULATION CENTRE,
- VA HOSPITAL, AND
- LI KA SHING


Over 23 different courses

COURSES included e.g. anesthesia crisis recourse management, anesthesia clerkship, emergency medicine
METHODS

DATA COLLECTION

• Pre and post questionnaires were used to measure the participants’ emotions

• In this study, the students were asked to evaluate the degree to which they felt a given emotion before and after the course
METHODS

DATA ANALYSIS

RQ1
- DESCRIPTIVE STATISTICS, FACTOR ANALYSIS, RELIABILITY TEST, PAIRED SAMPLE T-TEST

RQ2
- MULTIPLE LINEAR REGRESSION ANALYSIS, CORRELATIONS

RQ3
- K-MEANS CLUSTER ANALYSIS
RESULTS

THE MOST POSITIVE EMOTIONS BEFORE THE COURSE

- HOPEFULLNESS (M=3.72; SD=0.95, n=238)
- ENTHUSIASM (M=3.72; SD=0.87; n=234)
- ENJOYMENT OF STUDYING (M=3.76; SD=0.95; n=238)
- INTEREST (M=4.04; SD=0.82; n=235)
RESULTS

THE MOST POSITIVE EMOTIONS AFTER THE COURSE

- SENSE OF COMMUNITY (M=4.19; SD=0.85; n=231)
- ENJOYMENT OF STUDYING (M=4.29; SD=0.84; n=231)
- INTEREST (M=4.32; SD=0.77; n=231)
RESULTS

• **STUDENTS’ INTEREST** (*p*<0.001), **ENJOYMENT OF STUDYING** (*p*<0.001) and **SENSE OF COMMUNITY** (*p*<0.001) were statistically significantly increased when comparing the emotions before and after the course.

• **FEELINGS OF RELIEF** were the least experienced positive feeling (*M*=2.32, *SD*=1.03) before the course, but they were statistically significantly increased (*p*<0.001) at the end of the course (*M*=3.08; *SD*=1.22).
RESULTS

THE MOST NEGATIVE EMOTIONS BEFORE THE COURSE

- STRESS (M=2.91; SD=1.16; n=234)
- WORRY (M=2.94; SD=1.24; n=235)
- UNCERTAINTY (M=3.21; SD=1.13; n=235)
RESULTS

THE MOST NEGATIVE EMOTIONS AFTER THE COURSE

Worry (M=2.38; SD=1.14; n=231)

Uncertainty (M=2.49; SD=1.30; n=231)

Stress (M=2.79; SD=1.21; n=231)
• **UNCERTAINTY** (M=2.49, SD=1.30) and **WORRY** (M=2.38, SD=1.14) were also the most statistically significantly decreased emotions \((p<0.001)\) after the course
RESULTS

- POSITIVE EMOTIONS INCREASED ($p = .000$)
- NEGATIVE EMOTIONS SLIGHTLY DECREASED ($p = .035$)

M=3.33; SD=0.59

M=3.68; SD=0.65

M=2.07; SD=0.64

M=1.98; SD=0.71
RESULTS

VARIABLES EXPLAINING STUDENTS EMOTIONS

• **AGE** \((t=2.205, \ p=0.028)\) and **OTHER’S VIEWS** \((t = 10.273, \ p<0.001)\) explained the greatest portion of the variation in participants’ negative emotions after simulation \((R^2 =0.321)\)

• **THE CHALLENGES SET BY THE COURSE** \((t=4.945, \ p<0.001)\) and **GOAL-ORIENTED STUDYING** \((t=6.777, \ p<0.001)\) explained the variation in participants’ positive emotions after the simulations \((R^2 = 0.347)\)

\[\alpha = \text{from 0.84 to 0.89}\]
RESULTS

EMOTIONAL SUBGROUPS BEFORE SIMULATIONS

<table>
<thead>
<tr>
<th>Variable</th>
<th>Engaged (n = 77)</th>
<th>Neutral (n = 69)</th>
<th>Anxious (n = 76)</th>
<th>df</th>
<th>F Value</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive emotions</td>
<td>3.56</td>
<td>2.90</td>
<td>3.46</td>
<td>2</td>
<td>33.937</td>
<td>&lt;0.001</td>
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<tr>
<td>Negative emotions</td>
<td>1.59</td>
<td>2.23</td>
<td>2.40</td>
<td>2</td>
<td>49.287</td>
<td>&lt;0.001</td>
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<tr>
<td>Others’ opinions</td>
<td>2.17</td>
<td>3.06</td>
<td>3.89</td>
<td>2</td>
<td>177.218</td>
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<tr>
<td>Goal-orientedness</td>
<td>3.81</td>
<td>3.17</td>
<td>3.75</td>
<td>2</td>
<td>33.172</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Challenge</td>
<td>4.28</td>
<td>3.60</td>
<td>4.42</td>
<td>2</td>
<td>54.717</td>
<td>&lt;0.001</td>
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</table>
## RESULTS

### EMOTIONAL SUBGROUPS AFTER SIMULATIONS

<table>
<thead>
<tr>
<th>Variable</th>
<th>Engaged (n = 73)</th>
<th>Neutral (n = 70)</th>
<th>Anxious (n = 86)</th>
<th>df</th>
<th>F Value</th>
<th>p</th>
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</thead>
<tbody>
<tr>
<td>Positive emotions</td>
<td>4.22</td>
<td>3.29</td>
<td>3.56</td>
<td>2</td>
<td>61,311</td>
<td>&lt;0.001</td>
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<td>Negative emotions</td>
<td>1.48</td>
<td>1.88</td>
<td>2.48</td>
<td>2</td>
<td>60,712</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Others’ opinions</td>
<td>1.88</td>
<td>2.30</td>
<td>3.67</td>
<td>2</td>
<td>192,809</td>
<td>&lt;0.001</td>
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<td>Goal-orientedness</td>
<td>4.38</td>
<td>3.56</td>
<td>3.82</td>
<td>2</td>
<td>38,989</td>
<td>&lt;0.001</td>
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<td>Challenge</td>
<td>4.48</td>
<td>3.55</td>
<td>4.24</td>
<td>2</td>
<td>75,909</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>
CONCLUSION

• In the words of Seymourt Papert (2002), simulation-based learning can be described as **HARD FUN**

• This study also revealed emotional sub-groups as well as variable that may explains participants emotions which could help tailor instruction for individual students

• However, more research is needed, e.g. to study how emotions varies in different courses.
THANK YOU!
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