Emotional reactions and metacognitive engagement in a blended learning program through CBM

Introduction & RQ's

What is CBM?
With the CBM (confidence-based marking) alternative algorithm, individuals' personal self-efficacy (or self-confidence) is challenged at responding each multiple choice item, which has potentially a formative (+motivational +cognitive, hence metacognitive) effect. The learners' grades are adjusted based on the correctness/error of their answer in connection with their declared self-confidence (high, middle, low). Very soon authors reckon a formative potential in this technique (Gardner-Medwin, 2007).

Context
- Master for Secondary Teachers Education at the Universitat de Barcelona.
- Participants: Female (60%) : Male (40%) / graduates (74%) : post-graduates (26%) / Social Sciences (32%) : Natural Sciences (30%) : Arts (20%) / Vocational Ed. (18%) / Only studying (33%) / Family commitment (32%); AGE: M = 28.7 / SD = 7.1

Our purposes
- To carry out a formative use of CBM to consistently foster reflexive self-assessment and metacognition.
- To find out related emotional and metacognitive reactions.

Research Questions
- How do students evaluate the experience? (1-10)
- What personal conditions show greater influence on emotional experience and metacognitive awareness? (1-10)
- Sex, educational experience (graduates, post-graduates) curricular area (Social Science, Natural Science, Arts, Vocational ed.), workload besides studies (part-time job; full-time job; family commitments)
- Emotions: surprise, annoyance, fun, challenge, intrigue, reassuring
- Metacognitive reactions: setting learning goals, identifying learning needs, help-seeking behavior

12 weeks, 20 sessions

Table: Topics & Tests

<table>
<thead>
<tr>
<th>Test</th>
<th>Final Knowl.</th>
<th>Topics 1-2-3</th>
<th>Final Test Knowl.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CBM algorithm</td>
<td>if right</td>
<td>if wrong</td>
<td></td>
</tr>
<tr>
<td>High confidence</td>
<td>+3</td>
<td>-6</td>
<td></td>
</tr>
<tr>
<td>Middle confidence</td>
<td>+2</td>
<td>-2</td>
<td></td>
</tr>
<tr>
<td>Low confidence</td>
<td>+1</td>
<td>0</td>
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</tbody>
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Evaluation questionnaire

Results

Confidence based marking for SRL in Secondary Teacher Education

12 weeks, 20 sessions

General evaluation of the first and final test with CBM: first M = 6.2 / SD = 2.4 --- final M = 6.2 / SD = 2.6

General evaluation of the first test on prior knowledge:
- Graduate students: M = 6.54 / SD = 2.24 ; t(123) = -2.60, p = .006
- Postgraduate students: M = 5.21 / SD = 2.61

General evaluation of the final self-evaluative test:
- Graduate students: M = 6.68 / SD = 2.45 ; t(123) = -2.87, p = .003
- Postgraduate students: M = 5.09 / 2.78

Evaluating confidence:
- Female students: M = 4.6 / SD = 2.6 ; t(123) = 2.648, p = .004
- Male students: M = 5.8 / SD = 2.4

Emotions: Surprise (M = 6.2 / SD = 2.9), Annoyance, Fun (M = 4.9 / SD = 2.6), Challenge, Intrigue, Reassuring (M = 4.9 / SD = 2.6)
- Female students: M = 6.87 / SD = 2.92 ; t(123) = -3.515, p = .0003
- Male students: M = 5.44 / SD = 2.92
- Graduate students: M = 6.3 / SD = 2.7 ; t(123) = -3.03, p = .004 --- M = 5.3 / SD = 2.6 ; t(123) = -3.21, p = .0012
- Postgraduate students: M = 4.6 / SD = 2.4 --- M = 3.7 / SD = 2.4 ; t(123) = -3.21, p = .0012

Metacognitive reactions: identify doubts and anticipate questions (M = 5.7 / SD = 2.5); contrasting results with class-mates (help-seeking and reassuring strategy) (M = 4.1 / SD = 2.6)
- Graduate students: M = 4.5 / SD = 2.7 ; t(123) = -3.03, p = .004
- Postgraduate students: M = 3.1 / SD = 2.1

No sign. difference regarding curricular area nor workload (family or part-time nor full-time job)

Conclusions

Significant differences were mainly located on age and/or educational experience: students with just the Bachelor degree as requisite for accessing the masters program for becoming Secondary teacher versus students with other previous Master degrees or even PhD. Results point to different learning cultures sharing space in the masters program: (1) older, adult students, more inclined to individual learning and to not altering their own learning strategies versus (2) younger adults more inclined to peers collaboration and welcoming innovative learning strategies.

To up to now, no connection of emotions and CBM has been made in the literature. Our results show difference regarding sex in relation to the experience of annoyance: women felt worse than men in this case.

Limitations and future research

- Specific answering strategies could be studied by means of logfiles

Some references...


