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

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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%) : p.t. or f.t. Job (67%) / No family commitment (68%) : family commitment (32%); AGE: M = 28.7 / SD = 7.1)

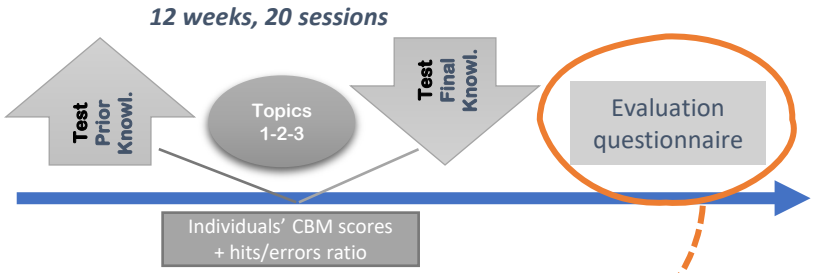
Our purposes

- ❑ 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

Instructional Design & Research Method



CBM algorithm	if right	if wrong
High confidence	+3	-6
Middle confidence	+2	-2
Low confidence	+1	0

Results

- ❑ **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 = 6.66 / 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 ;***
  - ❑ 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 & Limitations

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.
- ❑ 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

- ❑ Particular context >> other cultural contexts should be explored as well to compare
- ❑ Particular instructional design >> would other instructional purposes given to CBM provide similar results? For example, with more trial occasions in the course, or adding a summative component?
- ❑ Particular discipline (teacher education) >> would other disciplines at HE with less psycho-educational learning contents draw similar results?
- ❑ More basic emotional reactions should also be studied in connection with CBM: pride, joy, sadness, shame, …
- ❑ Specific answering strategies could be studied by means of logfiles

Some references…

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