International Society of the Learning Sciences

Emotion objects: An embodiment of learning socioscientific issues with heart

Jessica Shuk Ching Leung, The University of Hong Kong, leungscj@hku.hk
Maurice Man Wai Cheng, The University of Waikato, maurice.cheng@waikato.ac.nz

Abstract: This multiple-case study examined students' patterns of emotion objects and their learning of obesity as a socioscientific issue. We tracked the emotion objects of four university students over a 12-week general education course on obesity. We found that students with different depth of learning had distinguishable sets of referents of emotions. This paper points out the need to attend to and specify emotion objects as a key variable in future research regarding emotions.

Introduction

Emotions play a role in our learning of an issue and our interpretation of what to do about the issue (Moors, 2014). Emotions are *about* something (Keltner & Lerner, 2010). For example, when we are angry, we are angry *about* a specific referent, such as an event, or something that someone has said or done. Following this logic, there are at least two key elements of emotions in operation. One is the emotion *per se* (i.e., what is the emotion?). The other key element of emotions is their referents (i.e., what is the emotion *about*?). Being specific about referents would help us better understand students' emotions. Although the referents—the *aboutness*—of emotions are known as emotion objects, they do not only refer to physical objects. They can be a variety of phenomena, problems, information, concepts, stakeholders, or experiences.

Foregrounding emotion objects is particularly important in learning socioscientific issues (SSI), which are inherently complex, demand on-going inquiry about ideas and phenomena related to the issues over an extended period of time, and involve perspective-taking. These features mandate that even examining a single SSI involves different phenomena, problems, information, and concepts (Zeidler et al., 2019). When making decisions about strategies to address obesity, students need to consider what is good/bad, just/unjust, and right/wrong from the vantage points of various stakeholders, and reflect on their notions of caring and concern for others. In this sense, having emotions about these emotion objects could be a target of learning (Vea, 2020).

Besides examining students' reasoning (i.e., learning SSI with heads), it is also important to identify the ways that their decisions relate to their emotions (i.e., learning SSI with hearts). The concept of emotion objects allows us to identify a variety of emotions with specific referents, which goes beyond discrete emotions of generic referents. Based on our findings of students' conceptual changes about obesity as an SSI, as manifested in adhering less to a reductionist view about obesity and more to a systems view that consider political, marketing, socioeconomic, technological, and cultural dimensions (Leung & Cheng, 2020), our research question was: "For students with different extents of conceptual change, in what ways did their emotion objects differ?

Method

From a cohort of 114 students who took the university general education course on 'obesity', we purposefully selected two students who demonstrated significant conceptual change and two demonstrated little change. This multiple case study (after Yin, 2018) relied on multiple sources of data to answer the research question.

Weekly reflective journals (time span: 12 weeks)

Throughout the course, the students kept a weekly journal to record their reflections on learning about obesity. Open and iterative coding was performed for emotion objects and the associated emotions. The coding and analysis process involved several rounds of collaborative discussion and refinement. Discrepancies were discussed until consensus was reached.

Follow-up interviews (time: six months after the course)

We conducted individual semi-structured interviews with all those who indicated that they were available. These interviews probed a deeper understanding of the emotions experienced in their learning about obesity. Four cases were selected from these interviewees for the contrasting observations we made of their post-course survey, in which they were asked the extent to which they would assign responsibility for obesity to each of the following categories: government, the food industry, science and technology, society, and individuals. Sylvia and Syrus (all pseudonyms) only assigned 10% of the responsibility to individuals. With the support of other data also, they were regarded as holding a systems-level view of obesity. Reynold and Rebecca assigned 50% of the responsibility to individuals, suggestive of a more reductionist view about obesity. After developing an emotion

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profile for each case, we conducted a cross-case matrix analysis (Miles & Huberman, 1994) to reveal similarities and differences among the four participants.

Major findings

Social phenomena

Sylvia expressed helplessness and worry about phenomena. These negative emotions were often accompanied by her action tendency in response to the concerned issues. A similar pattern was also observed in Syrus.

> I have never imagined the influence of the business sector on policy making or public education and feel helpless about that. As a citizen, I recognize the responsibility to be critical about different information … (Week 3, Sylvia)

In contrast, despite expressing her helplessness about phenomena, Rebecca did not demonstrate any action tendency.

> Such a potential problem does cost a lot to society, undoubtedly some measures are needed to ease this obesity trend ... However, most of the measures are not very effective… (Week 12, Rebecca)

Stakeholders

Another key expression by Sylvia was empathy for the obese, which was also noted in Syrus's reflections, but neither Reynold nor Rebecca expressed such emotions.

> Obese people *suffer* a lot from mental burden owing to our *prejudice and misunderstanding*... Sometimes they have no choice about being obese … but they are *born to be forced to accept teasing* by others ... Respect should also be given to obese people for they are also born to be protected by universal human rights. (Week 10, Syrus)

A key stakeholder within obesity is the obese. While both Sylvia and Syrus expressed empathy for the obese, Reynold and Rebecca expressed little emotion about the obese in their reflections.

Discussion and conclusion

This study found that students who underwent significant conceptual change demonstrated a specific set of emotion objects. These emotion objects included obesity as social phenomena and the obese people as key stakeholders. We found that those who demonstrated little conceptual change did not tend to have emotions about these social phenomena and stakeholders.

In this sense, identifying emotion objects is important not only to enhance our understanding of student emotions but also to make better sense of their learning. That is, emotion objects are a key variable associated with their success of learning SSI. As our data shows, these emotion objects are indicative of what matters to students. The findings of this study offer valuable insights that can guide future teaching on learning SSI with hearts by directing students to specific emotion objects at stake to the SSI.

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