

Exploring the “Epistemic Frame” Concept in Chemistry Education for Technology Integration Activities

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Introduction

According to David W. Shaffer¹, an “epistemic frame” is a mechanism through which students can use experiences in video games, and other interactive learning environments to help them deal more effectively with situations outside of the original context of learning. The concept extends the idea of “communities of practice”² and suggests that different communities of practice have different epistemic frames: different ways of knowing and of deciding what is worth knowing. “Epistemic” is perhaps the trickiest word in Shaffer theory. Epistemic concerns the conceptions of what knowledge is valid and valuable. Or as Shaffer says, “it is about what it means to know something”. He stresses that it has to do with accountability, and judgments, and that it is thus decisive for the way you look at the world. An epistemic frame also includes methods for justification, explanation, and forms of representation, as well as self-identification as a person who engages in such forms of thinking and ways of acting. Creating activities in this perspective implies developing expertise of some particular kind, from some particular perspective, relative to the ways of knowing of some community of practice. The objective of this work is to show some initial results of a research being conducted in the *Interdisciplinary Laboratory for Formation of Educators – LIFE* at Federal University of Rio de Janeiro, in order to formulating practices that include the use of educational technologies to the curriculum repertoire of teacher education. Framing, then, involves the (usually tacit) identification of features that cue particular frames and thus expectations of subsequent activity.

Results and Discussion

In this work we use the concept of epistemic framing as a theoretical guide for the selection of applications (apps) focused on chemistry education. These apps are used in activities with undergraduate chemistry education students and in-service high school teachers from the state system of Rio de Janeiro. These activities are developed in an Interactive Educational Surface (IES): a 38ª Reunião Anual da Sociedade Brasileira de Química

technology that integrates a 56-inch touch screen Smart TV to a computer, allowing the development of interactive activities with groups of up to ten people. The activities were conducted with the IES in the horizontal position, with participants willing around. The apps were chosen by a team of pre-service teachers taking into account the nature of the chemical knowledge that is considered to be important for activities aimed at secondary school. The main decision raised by the group refers mainly to the nature of the application, and less on what specific application should be chosen. Two types of domains (relating to what the group considers worth of knowing) were chosen: (i) empirical, e.g. laboratories simulators; (ii) representative, in terms of the ability to show molecules and their structural representations. Assessment strategies involve audio and video recording of the interactive schemata made by the participants using the IES. During these processes of interaction, participants are encouraged to express their opinions and evaluate the scheme.

Conclusions

The notion of epistemic frame proved to be a useful tool for the development of activities that mobilize and appraise the esteem of “being a chemistry teacher”. However, it is not possible to make the same assumptions about interdisciplinary work. This means that we need to test modes and new activities in which it would be possible to verify the confluence of the borders from different epistemic frames, and may thus enhance interdisciplinary schemes of action. Our next steps include a check of the relationship between the issues proposed by David Shaffer and the concept of ‘belonging’ from Max Weber (*Vergemeinschaftung*).

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¹Shaffer, D. W. (2006) *Computers & Education*, 46: 223-234.

²Shaffer, D. W. (2004) *Journal of Interactive Learning Research*, 15:101-115.

³Weber, M. (1979) *Economy and Society*. Univ California Press. (2 vol.) Original from 1922.