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Hydrology and Earth System Sciences Discussions

Interactive comment on "Experiences of using mobile technologies and virtual fieldtrips in Physical Geography: implications for hydrology education" *by* D. G. Kingston et al.

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General comments:

This paper is a case study for the special issue "Hydrology education in a changing world". This focuses on an exercise in urban meteorology, which is clearly relevant to hydrology. With reference to the questions posed to reviewers:

(1) The theme of the special issue differs somewhat from the journal's declared scope, but the paper addresses questions posed in the special issue overview (http://www.hydrol-earth-syst-sci-discuss.net/special_issue72.html), including: "How

should field trips be designed for best learning experiences? Which new ideas are available for supporting student learning and understanding of hydrological systems? What set of skills and competencies do hydrologists need to have to be effective. . .?"

(2) The concepts and tools used in the study (PDAs for field exercises and a virtual field trip) are not novel, but their use in combination may be (the text doesn't specify).

(3) The findings of the study are useful, but the conclusions could be stronger (p. 11124, para. 3): "it can be tentatively concluded that where virtual fieldwork and mobile technologies have the potential to increase interactivity of the educational experience, they should be welcomed."

(4) The methods and assumptions are generally valid and clearly outlined. The authors changed from using a traditional, time-limited field trip with paper maps to a virtual field trip on interactive DVD with PDAs. GPS data were plotted on digital maps using ArcGIS and Google Earth. Students who had done the exercise in its previous incarnation were recruited for a focus group to evaluate the new approach. Their responses, which were tabulated, indicated a preference for the new approach (with some caveats). Mean student scores, the numbers of first-class scores, and numerical student evaluations were all higher after the change. The discussion of the challenges posed by the change (e.g., "front-loading of staff time" [p. 11123, para. 2]) is helpful.

(5) The results are generally sufficient to support the interpretations, but more information would strengthen the findings (see specific comments on Section 4 [below]).

(6) The approach taken in the paper is generally reproducible.

(7) The authors reference previous studies only in the introduction.

(8-12) The title, abstract, presentation, language, and math are all appropriate.

(13) The paper doesn't need to be condensed or clarified.

(14). Because the focus of the paper (physical geography in the UK) is somewhat

HESSD

8, C6162–C6164, 2012

different from my own (geology in the USA), I can't be certain about the number and quality of references (but see reply to #7).

(15) No supplementary material is included.

Specific comments:

Sect. 4 (Evaluation): Information about how the focus group was recruited would be helpful. What were the numbers of first-class grades for the old and new modules? Was the change in mean student feedback scores significant? The two student comments quoted are supportive, but a table summarizing student comments on strengths and weaknesses of the old and new modules would be more substantive.

Sect. 5 (Discussion and implications for hydrology education): References are needed to support some of the statements, such as: "increased interactivity, use of technology, and opportunity for learning by doing. . .are considered key causes of the positive student feedback and improved marks" (p. 11122, para. 4), and "(s)kills with such technology are highly likely to improve the employability of graduates" (p. 11124, para. 2). Have there been previous studies of student perceptions of virtual versus real field exercises? The reference by Spicer and Stratford (2007) appears to be relevant, but it wasn't cited.

Table 1: What is the scale for questions 6 and 8? Does the score refer to number of participants who agreed?

Technical corrections:

p. 11117, para. 1: "Wagner" should be "Wagener" (as in the references). p. 11124, para. 2: "increasing" should be "increasingly" p. 11125: The references Smith et al. (2002), Spicer and Stratford (2001), and Stott (2007) aren't cited in the text.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 8, 11115, 2011.