Institute for Medical Informatics, Statistics and Documentation (IMI)
Research Unit HCI4MED

Medical University of Graz

ID 58
Interactive Technology for Enhancing Distributed Learning: A Study on Weblogs

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Wednesday 2 September, 2009, 14:00-15:30 - Encounter Session
Venue: Møller Study Centre, Churchill College, University of Cambridge

Chairs: Christian Richardt & Stephen Brewster

- **Question:** Whether, and to what extent, the forced use of Weblogs is able to contribute towards addressing, and possibly overcoming, massed (or crammed) learning
- BCS HCI reviewer comment: "*It is a sad reflection on modern students that they have not been trained to adopt the "little and often" learning strategy that has students working conscientiously throughout a module. As a result they leave things to the last moment and their learning is probably somewhat superficial, sticking until the examination is over and then largely forgotten*"
- **Fact:** Just before the exam students learn day and night and they can acquire a substantial amount of information, which at least suffices to pass the exam.
- **Keywords:** Distributed Learning, Massed Learning, Learning Performance, Web 2.0, Weblogs

- **Massed Learning:** impairs the efficiency and retention of information over a longer period (Ruch, 1928), (Underwood, 1961), (Underwood & Ekstrand, 1967), (Cepeda, Pashler, Vul, Wixted & Rohrer, 2006).
- **Distributed Learning:** Benefit, at least with item lists (single word presentations) has long been reported by classic work from (Ebbinghaus, 1885), (Jost, 1897), (Thorndike, 1912), or more recently from (Greeno, 1964).
- **Weblogs:** can be used to support and encourage reflective practice (Beale, 2006), (Beale, 2007).
- **Success:** However, empirical research is only sparsely focused on the measurable success of learning performance (Du & Wagner, 2006) and research in real-life settings is rare.
- **Thinking:** Nardi et al. regard to five main motivations for blogging, which include thinking by writing (Rosenbloom, 2004), (Nardi, Schiano, Gumbrecht & Swartz, 2004) and state a valuable opportunity to stimulate learning by inspiring thinking.
- **Constructivism:** Weblogs can be used as online learning logs in order to support constructivist learning models, wherein the learners focuses on learning as a process, i.e. the learners can build their own cognitive structures and mental models (Du & Wagner, 2006), (Du & Wagner, 2007).

- **Setting:** This study was carried out within the lecture 706 921 "Human-Computer Interaction: Applying User-Centered Design" (4,5 ECTS credits) intended for master students of Computer Science (TU Graz study 921) and Software Development (TU Graz study 924)

- **Materials:** Final exam tests for both declarative (facts) and conceptual (concepts) knowledge:
  - a) factual knowledge: 10 dichotomy yes-no decisions (20 points maximum), 8 MQ-questions (24 points maximum),
  - b) conceptual knowledge: to explain the process model of UCD (26 points maximum)
  - NB: The conceptual knowledge questions were not provided at the pretest (t1)

- **Participants:** N=28 (4 f, mean age = 24 y (SD=1,33)) undergraduate students of computer science were randomly assigned to two groups of equal size:

- **Procedure:** The experimental group were provided with a Weblog and were instructed to use this Weblog continually for developing their paper and studying during the lecture and they were requested not to reveal their group affiliation; whereas the control group proceeded as normal (without access to the Weblog).

- **Methods:** 3 x 2 factorial design (within – repeated measures) with pre-test and post-test in a real life setting the study lasted for the whole summer term 2007 and additionally, in summer 2009, a long term analysis was made. The data were analysed using MANOVA for repeated measures. For all tests, an error level of alpha 5% was accepted.
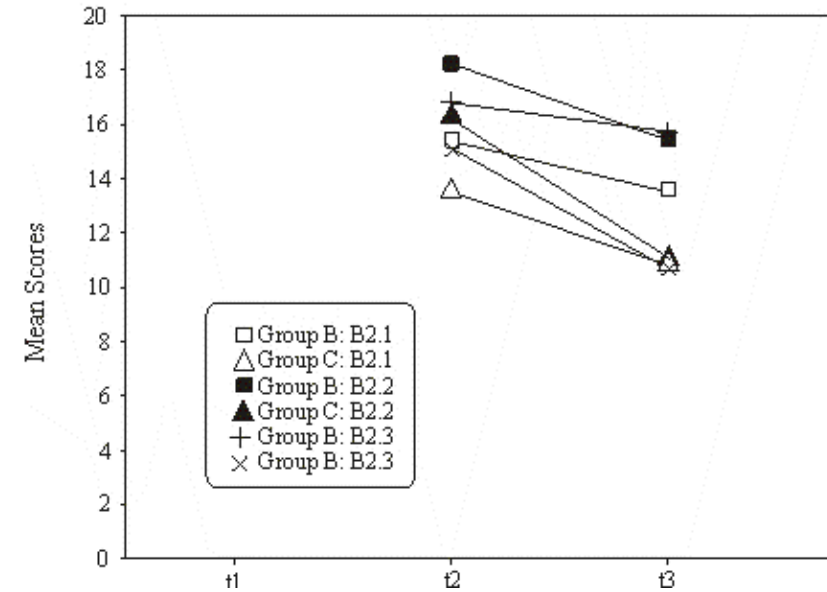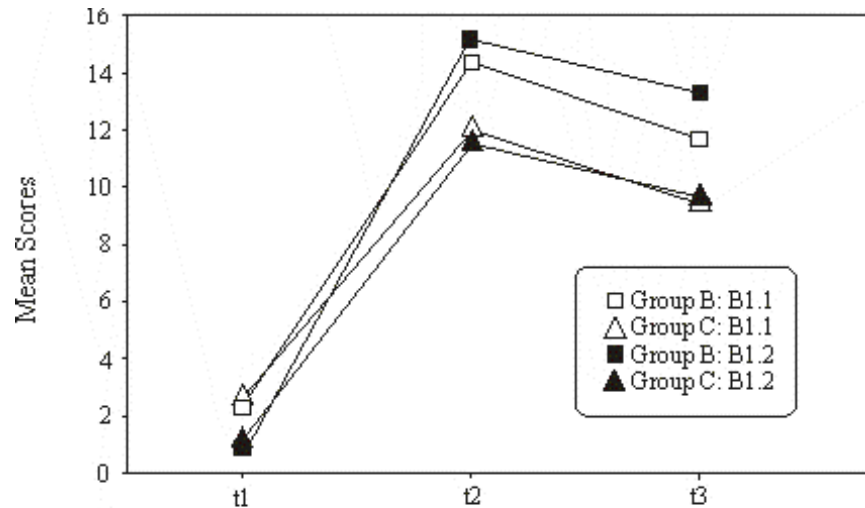
t1= 2007, February, 26
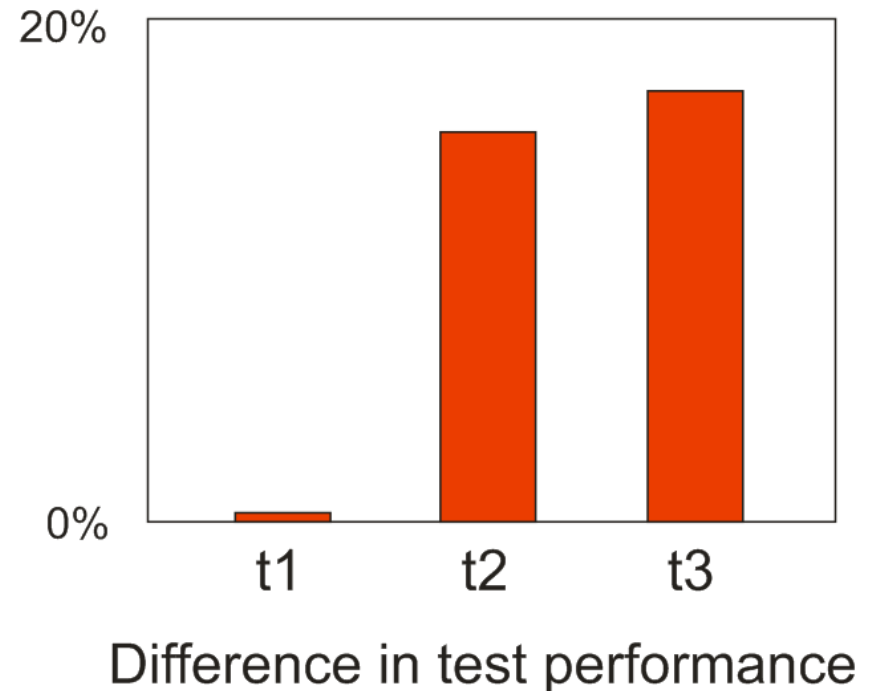
t2= 2007, June, 25

t3= 2009, June, 22

B ... Blogging Group

C ... Control Group

1+2 ... factual knowledge

3 ... conceptual knowledge

- This is the difference between both groups:
- at first no differences (as it must be) and then significant differences:
- The Blogging Group performs significantly better,
- and the same effect still appears after 2 years (t3)

Difference in test performance

■ **Result:** In this setting, students who were required to use the Weblog during the whole semester, did perform significantly better than the students who relied on their usual learning strategy.

■ **Interpretation:** Forced use of Weblogs can facilitate a more distributed *learning behaviour.*

■ **Conclusion:** This result provides an indication that Weblogs can be an appropriate instrument to improve *learning performance.*

■ **Limitations:** However, at the moment it is unclear whether this result is due to effects of a more distributed learning or whether publishing and discussing in Weblogs per se facilitates a deeper learning. Consequently, this study has clear limitations. We must emphasize that Weblogs are surely only one possible method and that the variable which did cause the positive effect, was possibly directly connected to the enforcement to use the Weblog continually with which the blog group was confronted.

■ **Further research:** is necessary, to find out more about the didactics of using weblogs in classroom settings and ethical issues on the enforced use of such instruments.