Individual Preparation and Argumentation Scripts in Social Networking Sites

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Abstract: We analyse collaborative argumentative learning in Social Networking Sites. In a controlled 2×2 study ($N = 128$), we crossed individual preparation and argumentation scripts implemented through Facebook apps. The results show that argumentation scripts can have positive effects, while individual preparation can have negative effects on knowledge co-construction. We discuss, how early knowledge solidification may impede knowledge co-construction.

Keywords: Argumentation, knowledge co-construction, Social Network Sites, Scripts

Argumentative knowledge construction in social networking sites

Social Networking Sites (SNS) can be considered an authentic context for social and informal forms of learning. However, it is not yet clear if SNS can be appropriated for academic knowledge construction. We investigate how argumentative knowledge construction (AKC; Weinberger & Fischer, 2006) can be leveraged for learning in SNS.

Argumentation scripts are used to foster AKC in CSCL (Noroozi, Weinberger, Biemans, Mulder, & Chizari, 2013), and may prompt learners to form formally adequate and elaborated arguments, consider multiple perspectives, and gain argumentative knowledge (Weinberger Stegmann, & Fischer, 2010).

Individual preparation allows students to prepare their individual arguments, reflect on their standpoints, and anticipate counterarguments (Marttunen & Laurinen, 2001; Weinberger et al., 2010), but may hinder multiperspective problem analysis, in comparison to collaboration with additional epistemic support (Wang, Rose, & Chang, 2011).

Based on the above findings, our hypotheses are: (i) Individual preparation may reduce process losses and foster argument elaboration, and knowledge co-construction. (ii) Argumentation scripts will enhance argument quality, argument structure, multiple perspectives, argument elaboration and knowledge co-construction due to the extra epistemic support that can reduce process losses from simultaneous processing of diverse ideas. As a result, (iii) all learners will gain knowledge, (iv) individual preparation and argumentation scripts will influence both individual and group knowledge outcomes. Finally, (v) there may be interaction effects on individual and group knowledge.

Methods

Figure 1. App with argumentation script, individual (left) and collaborative phase (right).

A 2×2 study with factors individual preparation and argumentation script (N = 128, Age M = 21, Women / Men = 74% / 26%) was conducted in the lab and lasted approximately 120 minutes. Participants were German university students and joined the study optionally. All participants filled in a pre-questionnaire with a knowledge test and read a text on behaviourism before constructing arguments on the question *"Should behaviouristic principles be applied in the classroom?"*, which was followed by a post-questionnaire including a knowledge test. All participants worked in an App integrated in Facebook. Individual preparation allotted extra time for the creation of arguments before collaborating with a partner. The argumentation script was operationalized through the App that prompted students to annotate their arguments with general argument types as well as domain specific categories (Figure 1). The knowledge test was analysed and adjusted in a previous study (Tsovaltzi, Puhl, Judele, & Weinberger, 2013). For our process analysis, we adjusted the multi-dimensional coding scheme by Weinberger and Fischer (2006). The interrater reliabilities were between moderate and very high agreement ranging from *Cohen's k* = .56, p=000 to *Cohen's k* = .81, p = 000. Group-level knowledge outcomes where measured as knowledge convergence (Weinberger, Stegmann & Fischer, 2007).

Findings

An ANOVA showed a strong main effect of argumentation script on argument structure, $F(1,60)$ = 6.05, p = .017, η_p^2 = .094, and argument elaboration, $F(1,60)$ = 5.04, p = .028, η_p^2 = .08, and a medium effect on knowledge co-construction, $F(1,59)$ = 7.65, p = .008, η_p^2 =.12. Individual preparation showed two negative trends, for argument elaboration, $F(1,60)$ = 3.30, p = .074, η_p^2 = .05, and multiple perspectives, $F(1,60)$ = 3.27, p = .075, η_p^2 = .05, and a small negative effect on knowledge co-construction, $F(1,59)$ = 5.08, p = .028, η_p^2 = .08. There was a large significant main effect of time on knowledge outcomes, $F(1,124)$ = 124,27; p = .000, η_p^2 = .50. Comparing post-test means, we found a small negative significant main effect of individual preparation on knowledge outcomes, $F(1;124)$ = 5.121; p = .025; η_p^2 = .04. Post-hoc contrasts showed a significant effect of argumentation script over the combination condition, $t(124)$ = 2,896, p = .005, d = 0.69. A repeated measures GLM showed a significant negative main effect of individual preparation on knowledge convergence over the three measure times, $F(1,60)$ = 4.93, p = .030, η_p^2 = .08. After the collaborative phase knowledge convergence becomes worse for all conditions, apart from the condition with argumentation script only.

Conclusions

Our results indicate that the argumentation script facilitated argument elaboration, argument structure, and knowledge co-construction. Argumentation scripts have the potential to promote collaborative processes and outcomes in SNS. However, in our study, the argumentation script could not alleviate the negative effects of individual preparation. Individual preparation hampered argument elaboration, multiple perspectives, knowledge co-construction and knowledge convergence. The results show that individual preparation may not always have benefits, but in some contexts can lead to premature knowledge consolidation and hinder knowledge co-construction.

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