Monograph "The Impact of Social Networks on Teaching and Learning"

ARTICLE

Use of Questions to Facilitate Social Learning in a Web 2.0 Environment*

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Recommended citation

Abstract

Online social learning involves distributed learners interacting through the use of Web 2.0. In many cases, Web 2.0 interactions are limited to information exchange and do not provoke knowledge construction. Studies of concept mapping suggest that engaging with social learning via a question could encourage meaningful interaction, although this would be likely to depend upon affective conditions and the effort involved in asking and responding to these questions. In order to investigate this, the interactions of 1,229 participants on a social learning site were studied over an 11-week period. Data were also collected from a questionnaire distributed to all participants, and from feedback contributed during the project. These were analysed thematically to investigate the ways in which questions can be used to facilitate learning in a Web 2.0 environment. Analysis showed that participants were interested in broad topic areas, themes and issues rather than specific questions

about these areas. They did not treat questions related to learning about the community and the website in the same way as questions related to learning about subject areas and content. The social use of questions online was identified as supporting meaningful learning interaction in nine ways.

Keywords

computer-mediated communication, pedagogical issues, social learning, online learning, questions

El uso de preguntas para facilitar el aprendizaje social en un entorno de web 2.0

Resumen

En el aprendizaje social en línea participan alumnos distribuidos que interactúan entre sí mediante la web 2.0. En muchos casos, las interacciones en la web 2.0 se limitan al intercambio de información y no promueven el desarrollo de conocimientos. Los estudios sobre mapas conceptuales sugieren que incorporar preguntas en el aprendizaje social podría favorecer una mayor interacción, aunque posiblemente esto dependerá de las condiciones afectivas y del esfuerzo que se invierta al plantear las preguntas y responderlas. Para investigar este supuesto, se han estudiado las interacciones de 1.229 personas inscritas en un sitio web durante un período de 11 semanas. También se han recopilado los datos extraídos de un cuestionario que se pasó a todos los participantes, así como las reacciones obtenidas en el transcurso del proyecto. Estos datos se han analizado temáticamente para investigar cómo pueden usarse las preguntas para facilitar el aprendizaje en un entorno de web 2.0. Los análisis han demostrado que los participantes estaban más interesados en temas, asuntos y cuestiones generales que en las preguntas específicas sobre cada ámbito. Los miembros de la plataforma han planteado de modo distinto las preguntas relacionadas con la comunidad y el uso del sitio web que las preguntas que les permitían conocer más a fondo ciertos contenidos y áreas temáticas. El uso social de preguntas en línea se ha identificado como una interacción de aprendizaje significativa y complementaria en nueve aspectos diferenciados.

Palabras clave

comunicación asistida por ordenador, cuestiones pedagógicas, aprendizaje social, aprendizaje en línea, preguntas

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1. Introduction

Web 2.0 technologies extend the possibilities of the Internet for learning, making it possible not only to locate and access a vast amount of information from all around the world, but also to engage in extended interaction around and about this material. These capabilities support and expand the possibilities for social learning, a form of learning that is "based on the premise that our understanding of content is socially constructed through conversations about that content and through grounded interactions, especially with others, around problems or actions" (Seely Brown, 2008).

Social learning offers the benefits of cooperative activity, in which different actors do different things in order to achieve a common goal (Van Oers, 2001). It also offers the benefits of collaborative learning if participants engage in a continued attempt to construct and maintain a shared conception of a problem in order to work together to solve a problem or perform a task together (Littleton, 1999). At the same time, online social learning offers the very real possibility that individuals will find themselves adrift in an "ocean of information" (Roach, 1988, p. 136), struggling to solve ill-structured problems with little clear idea of "which concepts, rules, and principles are necessary for the solution or how they are organized and which solution is best" (Jonassen, 1997, p. 65).

Learners typically require intensive instructional support to solve ill-structured problems because these necessitate the use of high-level reasoning skills (Jonassen, 1997; Jonassen, 1999). This level of professional support is not necessarily available to social learners, who may be taking an informal approach to learning or working to extend their formal learning. In either case, they may have little or no access to a teacher or mentor because computer-based collaborative learning environments are often organised on the basis that users will take charge of their own learning. In reality, a self-regulated attitude towards learning is not easily achieved and "it is necessary to provide users with guidance or assistance that enables them to learn on their own" (Puustinen, 2009). Designers of social learning sites therefore face the double challenge of providing ways to approach such problems and enabling learners "to interact meaningfully with others in developing knowledge and understanding" (Littleton, 2005, p. 148).

2. Use of Questions to Facilitate Learning

Solving ill-structured problems involves articulating goals, relating these to learning domains, clarifying alternative perspectives, generating solutions, gathering evidence and constructing arguments; these requirements have prompted the development of many instructional design models that bring these elements together in a variety of ways (Jonassen, 1997). One highly developed approach is through the use of concept maps to facilitate meaningful learning (Okada, 2008). A recommended procedure is to begin by developing a good focus question (Cañas, 2008). This question can then be used to help select concepts and to determine their relationship to each other (Derbentseva, 2006). Focus questions affect the ways in which a problem is understood, support the process of rationalising source materials and guide the direction of future deliberation (Buckingham Shum, 1996; Buckingham Shum, 1994).

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In the context of social learning, a question appears to be a good way of approaching a field of knowledge or a specific problem. Help-seeking and information-searching are fundamental components of learning, involving either requests for resources or "asking another person to contribute to one's achievement of the task or purpose" (Rouet, 2009, p. 1,011). Questions enable social learners to seek help in completing and understanding their tasks, and it is possible to develop systems to scaffold and support peer involvement in this social process (van Rosmalen, 2008; van Rosmalen, 2006; van Rosmalen, 2007).

Despite the importance of questions, they are not the best starting point for all types of learning because incisive questions are difficult to formulate (MacLean, 1991). Deakin Crick (2009) places questioning at stage three of inquiry-based learning, after choosing and describing a subject. In the context of help-seeking, Stahl (2009) showed that asking questions is part of a complex cognitive process that is not always carried out effectively. Students' requests for help develop over time, with older school students' requests proving "cognitively more understandable and socially more acceptable" than those of their younger fellows (Puustinen, 2009, p. 1,040).

The use of questions is also influenced by affective factors. Asking for help is effectively related to both motivation and confidence (Newman, 1994; Stahl, 2009). Respondents may be able to provide more useful assistance if they are aware of the prior knowledge, progress and goals of the person asking the question (Babin, 2009).

It is therefore not clear whether questions provide a way of structuring social learning from the start or whether they require individuals to have training, motivation and confidence in order to use them effectively. As this is an important issue for designers of online learning spaces and for lifelong learners, the research reported here investigates the use of questions to facilitate learning in a Web 2.0 environment and asks whether they are an appropriate starting point for social learners.

3. Data Collection and Analysis

In order to investigate the use of questions in social learning, the interactions of all 1,229 participants on a social learning site were studied over an 11-week period. The site was an early Beta development version of the SocialLearn initiative. The Open University, based in the United Kingdom, is currently developing this initiative as an internal innovation pilot, with the intention of making use of Web 2.0 technologies and social networks to enrich, extend and restructure current approaches to learning and teaching. Participants in the phase of the research reported here were adults recruited from the university's staff, student and alumni communities, as well as from organisations with an interest in educating their staff about climate change issues.

This Beta version was a website that was seeded with content, in the form of learning paths, notes and questions relating to the climate change theme, before access was generally available to Beta users. These users were then encouraged to create their own material and links to external sites. When users asked a question, commented on or answered a question, added a short update to their status or were active in other ways on the site, this was recorded together with the actions of

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other users in a frequently refreshed Event Stream available on the right-hand side of every page. The intention of this Beta version was to clarify whether these elements would promote interaction and learning, and would prove to be popular, engaging, useful and valuable for participants.

Questions were a central feature of the closed Beta platform, users were encouraged to ask questions, the content-creation tool prompted authors to link their learning paths to one or more questions, and the questions associated with a path were displayed on each path's home step (first page). In addition, questions could be answered, bookmarked, tagged, discussed and related to other questions.

With the informed consent of participants in the study, all activity on the site was recorded and data were also collected using Google Analytics, feedback pages and a questionnaire. All those registered on the site were able to register feedback at any point using the UserVoice application (https://uservoice.com/). Each page contained a feedback tab that allowed ideas and suggestions to be contributed and bugs to be reported. In addition, following the end of the Beta test, users were e-mailed a link to an online questionnaire; 191 people responded. The questionnaire contained 34 items related to users and their experience of SocialLearn.

Those registered on the closed Beta site included a sub-group of 19 learning mentors with extensive experience of learning and teaching using distance and online environments. Learning mentors were employed to spend time on the SocialLearn platform, exploring, reflecting and supporting other learners. While doing this, they were asked to feed back their thoughts, suggestions and reactions, and they did this through a Google group that they set up for this purpose.

Thematic analysis was applied to all these data sources to investigate the use of questions on the site. This analysis was divided into two parts. The first focused on the behaviour of all users, and their reflections on this through the questionnaire and feedback. The second focused on the sustained discussion of and reflection on SocialLearn that was carried out by the learning mentors over a three-month period.

4. Results

4.1. Use of Questions by SocialLearn Users

SocialLearn users, including the subject matter experts who seeded the site with content, published 306 questions on the site. These mainly related to the climate change theme of SocialLearn Beta. Examples included:

What action is being taken in the United Kingdom to adapt to climate change?
How does climate change affect me and where I live?
Is using my iTouch to use SocLearn more environmentally friendly than turning on the PC?
When a fleece is too ugly for the charity shop what do we do with them? As recycled plastic bottles, can you recycle them with the plastic bottles?

Users were encouraged to tag questions in order to help the site build semantic connections. They tagged all but 21 of the published questions (most were tagged multiple times). For example,

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the last question listed above was tagged "charity shops", "fleece", "recycle" and "recycled goods". These tags linked it to notes made by two other users and associated it with another question on the site "How can we reduce the amount of waste the United Kingdom produces?"

Users were also able to engage with questions by providing answers, linking them to paths, or rating them. When the site opened, each of the initial seeded questions was associated with at least one response. A further 99 responses were provided by site users, 15 questions were rated, 141 questions were associated with paths and 39 paths were bookmarked for future use.

The online questionnaire demonstrated that questions were popular with respondents. Ninety-four people responded when asked "Which questions about climate change would you like to explore / learn about?", making a total of 118 suggestions. These ranged from the specific:

> How climate change will impact on my role in Flood risk Management, the ecology of the British Isles, and the fluvial geomorphology/hydrological regime of our rivers.

To the more general:

> How to find easy, public access to clear and reliable information about climate change and its implications, so as to communicate to other people about it.

As well as varying in focus, they also varied in perspective. Some were from informed sceptics:

> My research has led me to believe that whilst a certain proportion of climate change may be human-generated, far more is as a result of the natural life-processes of my planet. I really don't have the time to research further and in any case, what on Earth am I, as an individual on a tiny land-mass, supposed to do about it?!

And some were from cynics:

> There's a multi-billion dollar industry now surrounding the fact that climate change is happening right now. Well people's jobs are on the line that climate change is going on right this second, that makes me sceptical.

Of the 118 suggestions, only 18 were traditional questions, ending in a question mark. It was rare that this was only due to a lack of punctuation. Some suggestions, like the first three above, packed a series of ideas, thoughts and queries together into a sentence or series of sentences that combined and intertwined many questions. Most respondents, like the last example above, chose to highlight areas of interest. Other examples included: "carbon trading, geological time mapping", "local action groups", "coping strategies in rich and poor countries" and "all the variant data sets and methodologies". One of the learning mentors reflected:

> Perhaps […] since we have been living search engines and the Web for so long, we have lost the habit of phrasing useful questions. Putting a few hopeful words into a search engine is not the same at all as crafting a careful and thoughtful question.

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Although users made considerable use of questions within SocialLearn Beta, they also frequently moved outside the site in order to post queries. Apart from the 118 questions that they proposed within the questionnaire, they also asked 49 questions on the UserVoice feedback pages rather than on the SocialLearn site. The vast majority of questions on the SocialLearn site related to climate change (only six asked for help with using the site), and there were no reflective questions about the site itself or about the Beta trial in which users were participating. In contrast, almost all questions in UserVoice and the learning mentors' Google group related to the site and to the Beta trial. When these issues were raised on the site, users added them to the Event Stream in the form of status updates, ensuring they would be visible to all users on the site at the time. Although the learning mentors were a small group of proficient site users, they also chose to ask 79 questions within their Google group rather than in public or in a private group on the SocialLearn site

4.2. Use of and Reflection on Questions by SocialLearn Learning Mentors

As this was a Beta site with many areas still changing or under development, the learning mentors had a series of queries about use of SocialLearn. When they raised these queries, like other users, they sometimes used the Event Stream that appeared on the right of every page to raise an issue:

> **Today [a named learning mentor] set status to**
> setting up a group called Group about not knowing what groups are for
> **Today [a named learning mentor] set status to**
> but finding I don't have a way to invite [a named site user] to use it

On other occasions, they took their help queries to the Google group. For example, these two queries were both answered quickly:

> Can someone tell me how to update my status? I just can't see it!
> When sending a message to a mentor, am I supposed to fill out a message in the text box just above, or click on the button first then wait for a new text box? Sorry, confused again.

Requests for help were not always phrased explicitly as questions, but were implied within the text of messages:

> I'm at a loss to understand who [the Event Stream] shows (or omits) and why, but I've been following that to see who is going where.
> I found it quite disconcerting initially figuring out how to respond to [a specific site user]. I thought of sending him a message, but I've done that to one person before and then could not find any record of the message I sent. It must be there somewhere; I just can't figure out where.

In both these cases, these comments provoked discussion and investigation, although other learning mentors did not provide direct answers.

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In their online discussion, the learning mentors were clear that the planned improvements to communication features on the Beta site needed to be put in place quickly. This was, in part, so that questions could be used to facilitate interaction:

> By its very nature, "SOCIAL" Learn must allow interaction – I want to be able to say "Did you see that path on ... it was great" or possibly more importantly, "I couldn't find anything on … am I missing something?".
> In my view we need to lead with social engagement so that people can come together to say "I'm new here, what should I do?", "I've just done this path and it was great – anyone any views?", "I want to know about X – where do I go?".

Overall, in their discussion, they identified nine ways in which questions could potentially be used to promote interaction within SocialLearn:

1. Asking questions as a way of advertising presence
2. Asking others to answer a question
3. Asking others to follow a recommendation
4. Asking questions as part of bouncing ideas around with a partner
5. Asking questions to prompt discussion
6. Answering other people's questions
7. Using questions to link with experts
8. Associating questions with mentors
9. Asking questions in order to locate more experienced users of the platform

5. Discussion

The figures on site use show that users found questions to be both useful and valuable. However, the questionnaire evidence suggests that questions did not prove to be an ideal starting point for social learning, because users were six times more likely to be interested in finding out about a broad topic area, an issue, a controversy or a set of information than they were to have a specific question to ask. The majority of the questions on the site were those seeded by subject matter experts at the start of the Beta trial. These experts were able to use questions as they would on a concept map: to provide ways of understanding a problem, to support the arrangement of relevant materials in a pathway and to suggest how an investigation of the area could be extended. The main body of users appeared to be more like inquiry-based learners, still at the stage of choosing and investigating a subject, but not yet ready to ask specific questions about it.

The use of SocialLearn and the related UserVoice and Google group sites showed a clear division of question types. This division was not between help-seeking and information-searching, which happened in both locations, but between different types of learning. Questions related to learning about climate change content were asked in SocialLearn, while questions related to learning how to use the site were asked either 'unofficially' in the Event Stream or on another site.

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This was particularly striking in the case of the learning mentors, whose brief was to learn about site use. They set their Google group up for administrative purposes before the SocialLearn Beta site was launched, but could, at any point, have transferred their discussion to a private group within SocialLearn. However, they maintained a division; talking about climate change content within SocialLearn and talking about social learning in their Google Group. They opted to talk about their learning, and to ask for help when necessary, in a stable environment where they were confident that everyone was engaged, where all group members would see their contributions and where questions were responded to or answered within hours.

In part, their choice of site appears to have related to urgency. When the learning mentors raised a question about climate change, they were in no hurry to receive an answer. However, when they raised a question about how to use the site, they needed the rapid response that was available to them within an active Google group.

The learning mentors' discussion revealed the need to ask questions related to a third type of learning. Users found ways of asking questions about climate change content and about the use of the site. They asked very few social questions that would allow them to forge links with people on the site. This was significant because all users faced a transactional cost if they responded to the questions of others. Lack of social connection limited motivation for taking on that transactional cost and, in fact, few extended learning dialogues took place on the Beta site. The nine types of question related to interaction that were identified by the learning mentors indicate how important such questions are in making contact with others, building learning dialogues, and establishing how much weight or credence can be attributed to others. On a site where relationships are built asynchronously online, questions that support learning about the community and its members play an important role in making other types of learning possible.

6. Conclusion

When building a social learning space or platform, designers should be aware that questions are not an ideal starting point. People who access a social learning site to address an ill-structured problem do not necessarily have sufficient motivation or prior knowledge to frame relevant questions. Like inquiry-based learners, they need opportunities to choose and examine a topic before they can start asking appropriate questions. It is at this stage that they can begin to use questions to focus their task and structure their future learning.

When individuals make use of a social learning site, they are likely to lack knowledge about content. They are also likely to lack knowledge about how the site works and about the people who make up the site's social learning community. They need opportunities to ask questions that will allow them to make sense of content, site and community. They also need to be confident that they will be able to receive timely and appropriate responses to their questions in all these areas. Unless they are able to build knowledge about how to use the site, and how they can interact appropriately with other users, they will be unable to engage in social learning. As they develop their knowledge about the site and its community, they can build both their confidence and their motivation to engage purposefully with others.

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Acknowledgement

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