The role of interaction in enhancing achievement and student satisfaction in an online course: A rubric analysis

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Interaction is highly prized in online and distance education courses. Essential qualities of interaction have been widely discussed in the literature and parts of some courses evaluated against these specific qualities. This paper examines a course that was designed and implemented using constructivist learning principles with a high level of collaborative interaction. At the end of this course students were evaluated to determine their perceptions of achievement and satisfaction. A rubric devised by Roblyer and Wiencke (2003) was applied to benchmark types and levels of interaction. The conclusion reached is that while high level, quality interaction was an essential contributor to these students' achievement and satisfaction, some aspects of instructional design require modification to further enhance achievement and satisfaction.

Introduction

Writing for Young People is a fully online Masters course which was based on constructivist principles with special attention paid to interaction between student and content, student and student, and student and instructor. This paper benchmarks the level and quality of interaction in this course. It does so by briefly examining those elements which promote student achievement and satisfaction as revealed in the literature on interaction in online and distance education courses. A rubric, based on theory and practice, and devised by Roblyer and Wiencke (2004), is then used to benchmark the interaction in this course. Finally, refinements regarding interaction in this course will be suggested.

Interaction in theory and practice

Interaction appears frequently as a defining characteristic of quality learning experiences in online and distance education. Sims (1999, p.2) defined interaction as 'those functions and/or operations made available to the learner to enable them to work with content material presented in a computer-based environment'. To this definition, Tu and McIsaac (2002, p.144) added that effective interaction also included cooperative activities and communication styles used by computer-mediated communication (CMC) users. Moore (1989, p.1) identified three types of interactions: learner-content; learner-instructor; and learner-learner. That interaction must be designed to match the learning task and students' different stages of development (Moore, 1989, p.5). Anderson (2003, p.3) added that learners must also interact with the instructional design. Moore believed that interaction between learner and content was paramount since here the individual engages in a field of knowledge, participates in a dialogue, interacts with concepts and questions and accommodates content. Engagement between learner and instructor was crucial in providing authoritative, stimulating, motivating and interesting content, as well as supporting, encouraging, and verifying the learner's response to knowledge application. (Moore, 1989)

Roblyer and Wiencke researched (2003, pp.85-86) the theory and practice of interaction in distance education courses in order to develop a rubric which would allow a meaningful examination of interaction. They highlighted the importance of student engagement and learning structured around collaborative experiences. Engagement and collaboration are also characteristic of constructivist learning environments using computer-mediated communication. Such constructivist learning environments offer 'authentic tasks, engage learners in meaningful, problem-based thinking, and require negotiation of meaning and reflection on what has been learned' (Jonassen et al, 1995, p.21).

Herrington et al. (2004, pp.11-13) researched authentic activities in web-based courses and concluded that authentic learning activities were: ill-defined; comprised complex tasks to be investigated over a sustained period of time; provided opportunities to examine the task from different perspectives; used a variety of resources; provided opportunities to collaborate; provided opportunities to reflect; offered integration across different subject areas and led beyond domain-specific outcomes; integrated seamlessly with assessment; created polished products valuable in their own right; and allowed for competing solutions and diverse outcomes.

Quality interaction is supported by 'social presence' according to Tu and McIsaac (2002, p.146) who defined this term as the 'degree of feeling, perception, and reaction to another intellectual entity in the CMC environment'. They found the following issues influenced interaction: timely responses to CMC messages; use of stylistic communication styles; casual conversation; communication strategies; appropriate message length; planning, creativity, intellectual, decision-making, and social tasks; and appropriate communication group size (Tu & McIsaac 2002, p.144). Positive influences on interaction occurred when the instructor provided time and activities so students got to know each other initially; when the instructor created a supportive environment and modelled positive communication; and when small groups were formed for interaction (Tu & McIsaac 2002) . Swan's research (2002, p. 34) on online courses also identified as important the instructor who interacts frequently and constructively with students. The students, though, required some control over interactivity in online learning in terms of pacing, choice of interactions, and their personal needs, experience and interests (Sims, 2003, pp.90, 101).

While there are many important elements essential to ensuring interaction in online and distance education, none appears more fundamental than quality instructional design. Wagner (1997, p.25) concluded that designing effective interactive learning experiences begins with considering the goals and objectives of the learning experience, with regard for the specific audience and the particular conditions encountered in a given setting. Wagner (1997, pp.21-22) suggested that interactions should change learners and move them towards an action state of goal attainment. By focussing on the outcomes of interaction rather than the agents of interaction, it is possible to determine whether the interaction has had the desired effect. This emphasis on outcomes of interaction returns then to the importance of instructional design.

Hirumi (2002, p.22) suggested using a 'grounded design' based on theory and research. Five reiterative steps guide the educator in designing and sequencing e-learning. Standard instructional design principles are highlighted, then Hirumi specifically highlights the importance of choosing appropriate interaction(s) to facilitate each event and analysing the quantity and quality of planned interactions; and selecting the telecommunication tools (chat, email, discussion board, etc) that will facilitate the interaction. The challenge in instructional design is achieving an interplay of all factors that influence interaction.

A course designed for interaction

In this section, interactive features of Writing for Young People which were highlighted in the literature and potentially impact on student satisfaction and achievement will be examined. Writing for Young People was developed as one of six courses in the Master of Creative Writing program first offered by the University of Canberra in February 2005. Although this course was designed for

online delivery using the University's learning management system (WebCT) with no face-to-face requirements, it also included some course materials and readings in print form.

The instructor for Writing for Young People created a 'world' of authentic learning experiences using constructivist learning principles. In this world, students would individually and collaboratively engage in writing, critiquing and reading original and published works for young people, respond to the literature, research the children's book industry, and experience its tensions and influences. The learning environment explored the interconnections in the children's book industry through the experiences of those involved in the industry. Students investigated practices, debated contentious issues, and interacted with practitioners. Simultaneously they created original works with an enhanced understanding of how the mediators between children and their books interact in this large and complex network.

The design of the supporting web site visually reflected the world of writing for young people. A comment from an Australian children's publisher inspired the web site's visual metaphor. Price (1991, p.179) said the 'road from story idea to finished book and then to satisfied reader is a long and perilous one, as any writer or publisher will tell you. It is fraught with dangers and distractions, there are many forks along the way, many choices to be made, and the signposts are never clear'. On the web site, the content was parcelled into intellectual 'chunks' and positioned so that content and visuals reinforced one another.

Each topic in the course used a similar instructional design as a scaffold to support studying and understanding the content. An overview described each topic and detailed learning outcomes. Interactive activities were designed, based on Salmon's (2002) idea for 'e-tivities' for online learning, to engage students. Each activity included a purpose, task, and outcome to encourage learner engagement, personal response and/or collaboration in small and large groups. Students could choose a range of ways to engage in interaction. They might post their views on the discussion board, record thoughts in their writer's journal, visit a bookshop or public library, talk with young people, engage in collaborative writing, discuss children's books, or engage in discussion forums. Strategically located readings extended the course content. Each included a brief description to focus attention and a task to consolidate what was read. Key points were scattered throughout the content to provoke reflection and discussion of contentious issues such as censorship, editorial influence, or the status of the industry.

Discussion forums, generated by the instructor, were designed for interaction and collaboration. They were concentrated over a short time frame to reflect learners' desire for immediate feedback, and to encourage maximum participation. Of prime importance to these students were the two Creative Writing Forums where they workshopped their original work for young people online, discussed these over a week with their colleagues, then posted a revised work including critical comment on their own writing process. Students' constructive comments on their colleagues' work were often highly detailed and included responses to others' comments as well. Towards the end of the week, the instructor responded to each creative piece. This allowed the instructor to expand the students' contributions by extending their views in related and new directions.

There were three discussion forums of another type. These tackled broader and more challenging concepts. In the Theory into Practice Essay, students researched a theorist of choice and its potential impact on the industry, plus its application on two published works for young people. Each essay was posted on the Theory into Practice Essays Forum, with everyone required to comment on one other essay. This assessment item demonstrated students' higher order thinking skills and encouraged knowledge sharing.

The Publishers Forum, spanning five days, provided a rare and real-world experience in interacting with four children's publishers from Australia and the US. The publishers collaboratively devised and posted a provocative statement featuring multiple interpretations and then engaged with the students in teasing out the intricacies of publishing for children. There were follow-up comments and a fascinating revelation and resolution of tensions between writers and publishers.

The Debate Forum was a culminating inquiry-based learning experience. Students formed affirmative and negative teams to research and debate the contentious proposition: there should be

boundaries set on writing for young adults. To facilitate team members working together, two private topics were created on the discussion board so each team could privately exchange ideas. They discussed, in often-heated passion, their case study material which included research documents, reviews, newspaper articles and other items built around two controversial young adult novels. Each team then collaboratively wrote four arguments, each limited to 350 words and posted these over an eight-day period. There was extensive asynchronous communication leading up to the Debate. One team also used the Chat tool in WebCT. Once the debate concluded, two external adjudicators, both experienced and knowledgeable librarians serving young adults, read the debate postings, scored the teams, and posted their report including scores and the winner. The Debate Forum teased out various values and viewpoints about the children's book industry while honing students' skills in intellectual argument, analytical thinking, problem solving, time management and teamwork.

All students were required to participate in five discussion forums including: two Creative Writing, Theory into Practice, Publishers and Debate Forums. The remaining activities were designed to cater for different interests and experience levels and thus offer an element of choice, allow students to pace themselves and choose when and how much they communicated.

Applying a rubric to analyse the level and quality of interaction

The course, Writing for Young People, was evaluated through an online questionnaire completed by 12 of the 13 students enrolled. Using these results to formulate questions, a focus group, consisting of nine of the 13 students enrolled, gave verbal feedback. Both evaluations provided detailed information about the instructor, course design, course content and use of the course web site as well as suggestions for improvement. Student comments on interaction were featured in both the questionnaire and focus group. These comments are summarised where views were commonly held by the students.

To analyse the evaluation data collected for this online course specifically in terms of its interactive qualities, a rubric that had been designed by Roblyer and Wiencke (2004) to determine the quality of interactivity in distance education courses was selected. Roblyer and Wiencke (2004, p 95) offer this rubric as 'one tool that can allow more meaningful examination of the role of interaction in enhancing both student achievement and student satisfaction in distance learning courses'.

This particular rubric was chosen as one which was based on theory and practice, tested by experts in the field, and used to evaluate distance learning courses. In using the rubric to evaluate interaction in the course, Writing for Young People, criteria that described the fifth, and highest level, of interaction was used. In this way, the rubric provided a benchmark for the measurement of the quality of the interactivity in this course.

One of the five elements of the rubric, Element #3: Interactivity of Technology Resources, examines the use of synchronous technologies. In the delivery of this course, these synchronous technologies were not considered an appropriate or effective strategy to meet the specified learning outcomes. Student needs for a high degree of flexibility were met through asynchronous communication. As a result, Element #3 was not applied as part of the total rubric in the analysis of the interactive qualities of this course. Applying the other four elements of this rubric provided a systematic way of analysing the impact and quality of the interactivity which was fundamental to the course design.

The first element of the rubric (Social Rapport-Building, Designs for Interaction) examines the way in which the instructor provided ongoing course structures to promote social rapport among students and with the instructor. This is in addition to providing for exchanges of information and encouraging student-student interaction and encouraging student-content and instructor-student interaction.

The development of a social presence as a basis for quality interaction as defined by Tu & McIsaac (2002) resulted in the establishment and maintenance of positive social rapport building. Effective online interaction requires a sense of trust and a social collectiveness. Early activities facilitated

this. The first activity asked students to post a short profile about themselves, their writing ambitions, and books they remembered from childhood. These elicited further dialogue between students and the instructor, established common interests, and provided the instructor with valuable information to later customise comments and ensure content reflected and extended their personal interests. Other early activities included sharing childhood emotions and childhood experiences, and discussing books with young people and then sharing their responses. These easily drew students into a shared arena and helped to establish a knowledge-sharing group. Student feedback indicated that they found that this course provided an opportunity for intimate communications to develop and the students formed relationships and friendships.

The second element of the rubric (Instructional Designs for Interaction) examines the ways in which instructional activities require students to develop products by working together cooperatively (e.g., in pairs or small groups) and share results and feedback with other groups in the class. This is in addition to the requirement that students communicate with their instructor.

Wagner (1997) emphasises the outcomes of interaction as part of goal attainment. This emphasis was incorporated in the underlying instructional design for this course. A constructivist learning environment as defined by Jonassen et al, (1995) which is based on authentic learning experiences as described by Herrington et al. (2004) resulted in most of the students (83.4%) believing that the course had enhanced their ability to critique each others' creative written work online They viewed this as a "perfect" methodology which removed potential embarrassment. Students stated that it also removed the aspect of immediacy and provided an opportunity for reflection and for the modelling of critiques. There were mixed reactions by the students concerning the perceived workload required which indicated the need for additional guidance from the instructor.

According to the instructor's records of each student's participation in activities, the majority of the free choice online activities engaged more than 50 per cent of the students while the five required online activities engaged between 77 per cent and 86 per cent of the students. According to course feedback, the use of an online debate, managed by two collaborative teams, was found by several students to be difficult at times and somewhat labour intensive, although described by others as 'fun'. Several students also found that small group interaction did not work as well as their large group interaction, and it was felt that several people did more work than other group members.

The third element of the rubric (Evidence of Learner Engagement) applied requires that by the end of the course, all or nearly all students (90%–100%) are both replying to and initiating messages both when required and voluntarily; messages are detailed, responsive to topics; and are well developed communications. Swan's research (2002) reinforces the need for high levels of learner engagement within an online discussion environment. In describing students' expectations of interactivity in online learning, Sims (2003) identified some of the essential elements. In this course the majority (91%) of students found that there was a high level of support provided by the instructor throughout the course and that this contributed to their sense of an interactive community. Fifty-eight per cent of the students felt that online participation was a valuable learning experience. Regarding posting and responding to messages, there were 790 postings by these thirteen students, with the lowest number of postings being ten and the highest number being 122. There were seven individuals who posted over fifty messages each, and the average was sixty-one postings. While the majority of students agreed that the workload was reasonable, a few felt more guidance could be provided as a guide to the amount of interaction required.

The fourth element of the rubric (Evidence of Instructor Engagement) applied requires that the instructor responds to all students' queries, always responds promptly (i.e., within 24 hours), always offers feedback, detailed analysis of student work and suggestions for improvement, as well as additional information to supplement learning.

In effective design for e-learning described by Hirumi (2002, p. 22) the key is the successful integration of all factors that influence interaction. In this course, the majority of students (92%) felt that the instructor responded promptly to queries and that they had been given sufficient feedback on their assessed work including detailed information about assessment grades. The instructor's guidance and immediacy of response was considered by the students to be outstanding and the

instructor was considered to be ‘generous and encouraging to students’ and ‘extremely knowledgeable and highly competent’. The students also valued the instructor’s guidance concerning how the online discussions were to be conducted and appropriate etiquette protocols.

Conclusion

The Writing for Young People course reflected quality interaction, in terms of student satisfaction and achievement, as identified in the literature. The rubric analysis confirmed that much of the online interaction in this course met the fifth and highest level identified by Roblyer & Wiencke (2004). The course Writing for Young People can be deemed successful through both analyses.

There is always room for improvement in any course revision. Students felt that the online debate was labour intensive. Case study materials will be reduced in number and the length of the debate shortened. While students praised having the wide choice of activities, this led to some very conscientious students undertaking too much. Generally the literature on interaction discusses ways to increase interaction. While interaction in this course was measured at high levels, students would benefit from more detailed guidance on the minimum amount of online interaction required and on managing workload. Writing for Young People was a challenging but satisfying experience for everyone. When the redesigned course is next offered, evaluation will examine whether the revised design for interaction further enhanced students’ achievement and satisfaction.

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