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Rubrics for designing and evaluating online asynchronous discussions

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Abstract
The purpose of the study reported on in this paper was to identify performance criteria and ratings in rubrics designed for the evaluation of learning in online asynchronous discussions (OADs) in post-secondary contexts. We analysed rubrics collected from Internet sources. Using purposive sampling, we reached saturation with the selection of 50 rubrics. Using keyword analysis and subsequent grouping of keywords into categories, we identified 153 performance criteria in 19 categories and 831 ratings in 40 categories. We subsequently identified four core categories as follows: cognitive (44.0%), mechanical (19.0%), procedural/managerial (18.29%) and interactive (17.17%). Another 1.52% of ratings and performance criteria were labelled vague and not assigned to any core category.

Introduction

Online asynchronous discussions (OADs) are a form of computer-mediated communication (CMC) increasingly used in post-secondary distance learning (Campus Computing International, 2000, p. 5). Asynchronous conferencing is 'the second most commonly used capability for online education', after email (Kearsley, 2000, p. 30), and has been referred to as 'a powerful tool for group communication and cooperative learning that promotes a level of reflective interaction often lacking in a face-to-face, teacher-centred classroom' (Rovai & Jordan, 2004, p. 2). Some research has uncovered evidence that participation in OADs can promote shared knowledge bases (Sherry, 2000), higher levels of thinking (Kanuka, 2005), reflective thinking, and collaboration (Markel, 2001), problem solving (Cho & Jonassen, 2002), knowledge construction (Gunawardena, Lowe & Anderson, 1997), critical thinking and cognitive presence (Garrison, Anderson & Archer, 2003).

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Although OADs offer the potential for realisation of many benefits, they do not guarantee that these benefits will automatically be realised (Murphy, 2004a). Participants in text-based discussions may experience difficulty processing and interpreting information (Gunawardena *et al*, 1997; Henri, 1992). They may remain at a comparing and sharing stage of knowledge rather than embarking on a more interactive and collaborative discussion that could promote higher levels of learning and critical thinking skills (Kanuka, 2005; Kanuka & Anderson, 1998; Pawan, Paulus, Yalcin & Chang, 2003). Bullen (1998) found 'limited empirical support ... for the claims made about the potential of computer conferencing to facilitate higher level thinking' (p. 2).

One method of verifying what, if any, benefits are realised in an OAD is transcript analysis. Transcript analysis involves the unitising and categorising of conference messages and the analysis of the resultant patterns of communication (Kanuka & Anderson, 1998). However, Rourke, Anderson, Garrison and Archer (2001) have described it as 'difficult, frustrating, and time-consuming' (p. 2). They provide a fictional account of a faculty member attempting to use transcript analysis to measure her students' achievements. She is beset by problems including technique, time constraints, reliability and ethical considerations. The account illustrates that transcript analysis is a technique more suited for researchers than for instructors. As the use of OADs increases, instructors also need a method to evaluate their students' engagement in processes such as critical thinking, problem solving or knowledge construction.

One method that has received attention from instructors is the use of rubrics. Rubrics are evaluation tools that clarify what is important to evaluate (Moskal, 2000) and that 'contain qualitative descriptions of performance criteria that work well within the process of formative evaluation' (Tierney & Simon, 2004, p. 1). Edelstein and Edwards (2002) found that rubrics can provide 'feedback regarding the effectiveness of a student's participation in a threaded discussion and offer benchmarks against which to measure and document progress' (¶ 13–14). Gilbert and Dabbagh (2005) found that rubrics 'positively influenced meaningful discourse in asynchronous online discussions' (¶ 16).

Two of the essential components of a rubric are the performance criteria and definitions (or ratings) (Popham, 1997). Performance (Arter, 2000) or evaluative (Popham, 1997) criteria identify the specific elements, or dimensions, of the task taught and assessed by the rubric (Jonassen, Howland, Moore & Marra, 2003; Popham, 1997; Tierney & Simon, 2004) and provide 'guidelines, rules, or principles by which student responses, products, or performances are judged' (Arter & McTighe, 2001, p. 180).

Ratings 'describe the way that qualitative differences in students' responses are to be judged' (Popham, 1997, p. 1), highlighting the difference between a performance that is assessed as fair or poor with a performance assessed as good or excellent.

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We uncovered no studies in our review of the literature that systematically identified the performance criteria or ratings assessed by rubrics for use in the evaluation of online discussions. The goal of the study reported on in this paper was to identify the range, type and percentage of performance criteria used in the rubrics for online discussions. For example: what behaviors and performances do instructors focus on, eg, problem solving, critical thinking? We also sought to identify the range, type and percentage of ratings used in the rubrics and to categorise the range and type.

Methods

We used four sets of search terms in Google™ and Google Scholar™ to locate rubrics. The first search term was simply *rubrics*. The second set of search terms used the following key words or phrases within quotation marks: asynchronous discussions, online discussions, discussion boards, CMC, computer-mediated communication, discussion forums and discussion fora. The third set of search terms pairs a keyword, or combination of words, with either rubrics; scoring guides; evaluate; assess; evaluation guide; post-secondary with the keywords used in the second search. The fourth set of search terms is as follows: discussion rubric, discussion board rubric, asynchronous discussion rubric and online discussion rubric.

We initially examined the rubrics to determine which statements were performance criteria and which were ratings. In some rubrics, row or column labels such as *category* or *criteria* explicitly identify performance criteria. However, not all rubrics use descriptive labels. In some cases, we identified performance criteria in the rubrics by reading the statements to determine if the statement was a performance criterion or a rating. For example, the statement 'Number of posts' qualifies as a performance criterion because it describes a specific dimension of student work assessed by the ratings. We coded statements that described a performance or activity as performance criteria and coded statements that assessed a performance or activity as ratings.

We assigned criteria found in the rubrics to categories based on patterns or recurring keywords, a process Miles and Huberman (1994) referred to as descriptive coding. The next stage of analysis consisted of grouping performance criteria categories that described similar types of performances or tasks, and grouping ratings' categories that assessed similar performances or tasks. This process of interpretively (Miles & Huberman) amalgamating descriptive criteria and ratings' categories continued throughout this stage of coding. In the final stage of coding, we examined criteria and ratings' categories to determine if any of the categories could be associated with any other. This inferential and explanatory process (Miles & Huberman) led to the assignment of the categories into a smaller number of core categories, each representing a single theme. Coding resulted in the generation of core categories.

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Findings

From the 50 rubrics reviewed for this study, we identified 153 performance criteria and 831 ratings (Tables 1–8). We organised them into categories based on keyword analysis, then amalgamated them into 19 performance criteria categories and 40

Table 1: Performance criteria categories assigned to the cognitive core category

Performance criteria category	*% of category*
Other	2.8
Thinking and reflection	2.8
Analysis, evaluation, interpretation, application and synthesis	1.6
Quality and relevance	1.6
Arguments	1.2
Ideas, insights, connections and links	1.2
Content	0.9
Feedback, incorporation, interweave and integration	0.5
References and support	0.2

Table 2: Ratings' categories assigned to the cognitive core category

Ratings category	*% of category*
Thinking, reflection and reasoning	12.1
Understand, comprehend and grasp	7.7
Analysis, evaluation, summarisation and synthesis	7.4
Content and information	6.7
Support	6.0
Connections and links	5.6
Original, creative, novel and new	5.1
Relevance and relationship	4.6
Response, reply and answer (discussion)	4.4
Application, explanation and interpretation	4.2
Miscellaneous	4.2
Evidence and argument	3.7
Opinions and insights	3.0
Ideas	2.8
Citations and references	2.6
Questions, problems and solutions	2.3
Concepts	1.6
Examples and sources	0.9
Weave, integrate and incorporate	0.9
Clarification, clarity and clear	0.7
Contribute and post	0.2
Feedback	0.2
Read and reading	0.2

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Table 3: Performance criteria categories assigned to the mechanical core category

Performance criteria category	*% of category*
Writing and style	7.9
Expression, delivery, mechanics and organisation	4.2
References and support	3.1
Language and grammar	2.6

Table 4: Ratings' categories assigned to the mechanical core category

Ratings category	*% of category*
Grammar, spelling and punctuation	24.6
Citations and references	10.5
Mechanics, organisation, structure and expression	9.4
Language, sentence, paragraph, word and vocabulary	8.4
Writing, composition and style	6.8
Examples and sources	5.8
Opinions and insights	3.7
Clarification, clarity and clear	3.1
Response, reply and answer (discussion)	2.6
Miscellaneous	1.6
Resources	1.6
Read and reading	1.0
Support	1.0
Understand, comprehend and grasp	1.0
Content and information	0.5
Relevance and relationship	0.5

Table 5: Performance criteria categories assigned to the procedural/mechanical core category

Performance criteria category	*% of category*
Timing, frequency and initiative	6.1
Participation	3.3
Best practices, etiquette and protocols	2.2
Expression, delivery, mechanics and organisation	1.1
Other	1.1
Quality and relevance	1.1
Content	0.6
Length	0.6

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Table 6: Ratings' categories assigned to the procedural/mechanical core category

Ratings category	*% of category*
Time, initiative and prompting	13.3
Hour, day, minute, date, deadline and late	11.6
Participation	11.0
Number	9.4
Etiquette and protocols	7.2
Frequently, regularly, freely, occasionally, rarely and sporadically	7.2
Quality, value, valid and good	5.5
Contribute and post	3.9
Miscellaneous	3.3
Read and reading	3.3
Respect, offensive and abusive	3.3
Response, reply and answer (discussion)	2.8
Opinions and insights	1.1
Ideas	0.6
Language, sentence, paragraph, word and vocabulary	0.6

Table 7: Performance criteria categories assigned to the interactive core category

Performance criteria category	*% of category*
Response and reply	6.6
Other	3.0
Feedback, incorporation, interweave and integration	1.2
Interaction	1.2
References and support	1.2
Ideas, insights, connections and links	0.6

ratings' categories, each describing similar types of performances or tasks. We subsequently analysed these categories for patterns to identify core categories (Miles & Huberman, 1994; Strauss & Corbin, 1990) as follows: cognitive (44.0%), mechanical (19.0%), procedural/managerial (18.29%) and interactive (17.17%). Another 1.52% of ratings and performance criteria were coded as vague and not assigned to any core category.

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Table 8: Ratings' categories assigned to the interactive core category

Ratings category	*% of category*
Response, reply and answer (others)	21.0
Interaction	12.6
Questions, problems and solutions	11.4
Response, reply and answer (discussion)	9.0
Feedback	4.8
Participation	4.2
Weave, integrate and incorporate	4.2
Collaboration, community and team-building	3.6
Resources	2.4
Thinking, reflection, reasoning and critique	2.4
Analysis, evaluation, summarisation and synthesis	1.8
Frequently, regularly, freely, occasionally, rarely and sporadically	1.8
Ideas	1.8
Application, explanation and interpretation	1.2
Connections and links	1.2
Miscellaneous	1.2
Respect, offensive and abusive	1.2
Opinions and insights	0.6

Discussion of the findings

Cognitive

We assigned over 40% of the performance criteria and ratings to the cognitive core category. This core category reflects a preoccupation with learners' thinking, with an emphasis on critical thinking, problem solving and argumentation, knowledge construction, creative thinking, and course content and readings. Criteria and ratings in this category reflect a preoccupation that ensures learners are not only providing information, but also engaging in higher level thinking skills such as analysing, interpreting or critically reflecting on the information presented in the forum. The criteria also emphasise learner's ability to show evidence of deep, rather than superficial, understanding and thinking. The ratings that focus on critical thinking skills include analysis, critical thinking, interpretation, evaluation, application (eg, to real life, to teaching or to personal experiences), generalisation, theorising and synthesis.

One of the outcomes of critical thinking is 'the acquisition of deep and meaningful understanding as well as content-specific critical inquiry abilities, skills, and dispositions' (Garrison, Anderson & Archer, 2004, p. 2). Garrison, Anderson and Archer (2000) refer to CMC as a way to create and maintain cognitive presence and to engage participants in critical thinking, while Oliver (2001) theorises that critical thinking skills are necessary to the ability to use electronic information meaningfully.

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We found few performance criteria or ratings that assessed learners' ability to suggest new applications of an idea or to apply solutions, and none that assessed learners' ability to apply or test hypotheses. We found few ratings that assess learners on presenting triggering events (ie, offering problems, issues or dilemmas to be solved). However, Garrison *et al* (2004) found that triggering events are likely framed by the teacher in an educational setting, while Murphy (2004b) found that problems can be triggered by any member of the group, intentionally or not.

Some criteria and ratings stress the importance of considered thought and evaluation rather than the expression of unsupported opinions and feelings, while others stress the value of providing analysis and interpretation rather than simply reciting information. These criteria and ratings move into a realm of argumentation and encourage learners to add strength and authority to their arguments by rating the relevancy, persuasiveness and coherence of the evidence or arguments presented. The notion of justification, explanation and supporting claims with evidence is emphasised in the rubrics.

Argumentation is essential to the intellectual ability involved in problem solving (Kuhn, 1991) and requires one to develop and support solutions (Voss, Wolfe, Lawrence & Engle, 1991). Hong, Jonassen and McGee (2003) found that the ability to argue affects one's ability to solve problems, while Cho and Jonassen (2002, p. 20) found that 'argumentation can be supported effectively by online argumentation scaffolds and that the production of better arguments directly affects the problem-solving activities that students use'.

Assertion or 'maintaining and defending ideas' (Pena-Shaff & Nicholls, 2004, p. 254) was poorly represented in the rubrics. One method of rating this behaviour is to rate learners on replying to messages that challenge their ideas. While several ratings assessed learners on referring to the comments of others, we found no ratings that specifically evaluated the learners' responses to challenges of their ideas. If cognitive development 'requires that individuals encounter others who contradict their own intuitively derived ideas and notions and thereby create cognitive conflicts' (Anderson, Rourke, Garrison & Archer, 2001, p. 7) and part of the instructor's role is to facilitate discourse, then ratings like these may indicate to the learners that debate and conflict are integral to the problem-solving process.

Few ratings specifically rated the learner on evidence of debate, agreement or friction. However, we located a number of ratings that rate learners on their ability to present viewpoints, perspectives and possibilities, and to strategize, compare or contrast. According to Brookfield (1987), it is the consideration of different perspectives that leads to a resolution of a triggering event. The ability to identify alternative perspectives is, according to Hong *et al* (2003), one of the elements that comprise argumentation, and thus one of the variables that predict learners' performance in problem solving.

Some of the ratings identified thinking skills related to problem solving, such as the ability to competently analyse problems, a necessary step towards resolution. We found

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ratings that assess learners on their ability to share reflections about the problem under discussion—ratings that also emphasise the collaborative nature of problem solving. Other ratings assess learners' ability to generalise, theorise and synthesise information, which can lead to increased collaboration and sharing of ideas, information and hypotheses. We identified a number of ratings in this core category that assess learners' ability to analyse and critique the problem and to reflect upon and evaluate group processes related to problem solving.

We uncovered little evidence from an examination of the ratings that they evaluate learners on the co-construction of new knowledge, or 'the assignment of meaning to phenomena for which the group does not yet have a common understanding' (Gunawardena *et al*, 1997, p. 143). We found few examples of ratings that looked for evidence of conflict or negotiation. However, conflict and negotiation are important elements in the construction of new knowledge through group negotiation because it is through these activities that learners 'engage in a meaning making or knowledge construction process' (Pena-Shaff & Nicholls, 2004, p. 245).

Pea (1993) argues that knowledge construction takes place through a process of discussion and social exchanges where participants can offer and entertain different perspectives. Koschmann, Kelson, Feltovich and Barrows (1996) maintain that this process can be more powerful where the discussion depends on the written word, as it does in an OAD. Kanuka and Anderson (1998) theorised that 'we construct knowledge in online learning environments through social interchange and a discord discussion' (p. 11).

Ratings encourage the construction of new knowledge by looking for evidence that the learners help identify, clarify, interpret or synthesise other group members' ideas; reflect on the group's efforts; and relate material to their own and others' experiences. Some ratings encourage learners to comment on each other's work, which may lead to meaningful discussions about the relevancy or appropriateness of ideas, problems and solutions, and lead to the construction of new knowledge. Other ratings encourage learners to introduce new or divergent interpretations of existing ideas or concepts, which may also lead to increased discussion and the construction of new knowledge. Still other ratings encourage learners to offer opinions, insights and ideas that may prompt further discussion, or to question and debate comments made by their peers.

We identified a number of ratings that assessed the learner's ability to apply, explain and interpret information; to use inferences; provide conclusions; and suggest solutions. These ratings may assist the learner in discovering and exploring 'dissonance or inconsistency among the ideas, concepts, or statements' presented in the forum (Gunawardena *et al*, 1997, p. 142). Ratings that encourage discussion and exchange of ideas, observations and insights may aid in creating more effective learning and assist in building what Garrison *et al* (2000) refer to as a community of inquiry.

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Mechanical

Anderson (2004) discusses the necessity of checking language, typing and spelling in OADs and notes that 'the imposition of a requirement to adhere to particular protocols or standards is a hotly contested question among e-learning teachers' (p. 284). Nonetheless, Anderson observes that 'requiring [a] high standard of written communication helps students learn to communicate effectively in the online learning academic context' (p. 284). He comments that he himself is 'much more tolerant of language informalities in postings' (p. 285). Rohfeld and Hiemstra (1995) claimed that their policy of overlooking mistakes in composition, spelling and grammar would encourage timely and less self-conscious responses and give 'a stronger voice to the reflective student who found face-to-face communication too fast and who now had time to compose a thoughtful contribution' (p. 11).

The core category 'mechanical' focuses on the assessment of language use, grammar and spelling, organisation, writing style, and the use of citations and references. Most of the performance criteria and ratings' categories included in this core category include those that assess learners on vocabulary and word usage; the organisation of sentences, paragraphs and messages; and correct spelling and grammar. The remaining ratings and performance criteria (less than 25% of the category) assess learners on the quality, clarity, appropriateness and quantity of citations and references.

The ratings that focus on mechanical aspects of writing and the use of language may serve to stress the importance of clarity through the use of correct spelling, grammar, language and structure. Those ratings that assess the learner on the use of language that is clear, creative, interesting and appropriate may also aid in clarification, as might those ratings that assess the accuracy, ambiguity, effectiveness or coherence of sentences and paragraphs.

Ratings that stress the importance of clarity when offering information, concepts, ideas, opinions or insights may make it easier for other learners to understand the learner's position. Ratings that stress the value of a writing style that is clear, unambiguous and accurate may help to avoid confusion and misinterpretation. Ratings that stress clarity may also benefit other learners by allowing them to concentrate on the message rather than spend their time trying to decipher unclear messages.

A second, smaller group of ratings checks for the inclusion, accuracy and format of citations and references, which indicate a preoccupation with ensuring that learners clearly present their information. Those ratings that assess the appropriateness of citations and examples may help to ensure that learners find and reference sources appropriate to post-secondary study. A number of ratings emphasise the importance of providing citations and references that clearly relate to the topic discussed. Ratings that stress the importance of providing a bibliography in the correct format attempt to ensure that other participants will be able to access referenced works.

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Procedural/managerial

Procedural and managerial elements of the discussion (18.29%) are managed by criteria and ratings that focus on learners' presence, contributions and conduct in the forum. While the time-independent nature of asynchronous discussion may facilitate participation and critical thinking (Bullen, 1998), these ratings help learners realise that posts and replies must be made in time for others to read and respond. Participation levels can indicate persistence. If students pursue a conversation through multiple levels, even if they diverge from the initial topic, their persistence may show that they are engaged in the topic, discussion or forum.

Requiring participation does not always result in increased participation, with some learners posting solely to get participation marks or to satisfy course requirements (Bullen, 1998; Hara, Bonk & Angeli, 2000; Murphy & Coleman, 2004). Hara *et al* (2000) found that 'there clearly is a pressing need to develop pedagogy that motivates students to electronically participate in class discussions beyond standard course requirements' (p. 141).

A number of criteria and ratings analysed assessed the frequency of learners' postings and/or their adherence to deadlines. Dennen (2005) found that 'deadlines had a clear effect on when students participated in discussion and, in turn, to what degree the discussion developed into an actual dialogue' (p. 139). However, some learners in Bullen's (1998) study felt that the discussion was 'stunted by the combination of the deadlines and the limited time frames for the discussions because learners waited until the deadline to contribute, which then left no time for follow-up comments or responses' (p. 9).

While participation is not a direct measure of learning (Dennen, 2005), it is necessary for learners to participate in order to have a successful discussion that may lead to knowledge building. Sing and Khine (2006) theorise that 'successful co-construction of knowledge requires active and broad participation. This implies that the messages posted should be substantial in terms of quantity' (p. 254). Ratings that encourage a higher quantity of participation may encourage a higher quality of participation. Likewise, ratings that encourage participation by rating quantitatively may motivate learners to post and respond. Ratings that assess the length of posts may encourage learners to reflect more deeply about the content of their posts and may promote a more in-depth analysis. Ratings that assess learners on contributing more than the required number of posts may indicate learners' engagement with the discussion (Fahy, Crawford & Ally, 2001; Hara *et al*, 2000).

Another rationale for rating participation quantitatively may be to measure density. The more dense a network, the greater the probability that participants are well connected with each other and that the community is well established (Fahy *et al*, 2001; Sing & Khine, 2006). Participation levels can indicate persistence. If the students pursue a conversation through multiple levels, even if they diverge from the initial topic, their persistence may show that they are engaged in the topic, discussion or forum. Fahy *et al*

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(2001) also found that learners who made fewer contributions to the conference overall tended to make their contributions early and did not persist with their contributions or show higher levels of interaction. We did locate ratings that assessed learners on the number of interactions with others—ratings that may be used to calculate density.

Ratings that assess learners on their conduct towards others may be beneficial in promoting an atmosphere of trust and sharing. We identified ratings that look for evidence of respect towards others, adherence to rules of conduct and use of the medium. A rationale for rating learners on their adherence to rules of conduct may relate to the notion that social relationships take longer to establish in CMC settings (Hara *et al*, 2000). However, Beaudin (1999) found that experienced online instructors ranked *present rules of conduct* eight out of 13 items. Fahy (2002) concluded from his study of an instructor-moderated graduate course that an 'expository interaction style was used by both genders with moderation, respect, and civility' (p. 12). We found few criteria or ratings in this study that rated learners on their adherence to rules of conduct. This finding may be because we were examining rubrics used to evaluate moderated discussions between post-secondary learners.

Interactive

Gunawardena *et al* (1997) referred to online interaction as 'the process through which negotiation of meaning and co-creation of knowledge occurs in a constructivist learning environment' (p. 141). Increased interaction with one's peers may indicate depth and interactivity (Hara *et al*, 2000, p. 140) and help to clear up confusion (LaPointe & Gunawardena, 2004). We found ratings that indicated that rubrics were assessing both depth and interactivity. Some rubrics encourage interaction and keep the discussion focused and interactive by using criteria and ratings that encourage learners to share their reflections, resources and thoughts about the discussion. Others look for statements that elicit or encourage responses from others; that contribute to the discussion; and that respond to others.

Positive interdependence and promotive interaction (Johnson & Johnson, 1996) are indicated by participants giving and receiving input, feedback and encouragement; by questioning and challenging; by exchanging resources and information; and by reflecting on the group's progress. We found a number of criteria and ratings that look for evidence of these indicators, which may indicate that instructors are using ratings to attempt to bind the participants together into an interactive group.

Discussion questions may engender 'elaborate responses from other participants' and prompt 'the question posers to engage in a process of clarifying, elaborating and providing their own interpretation of the questions they had raised' (Pena-Shaff & Nicholls, 2004, p. 258). We identified ratings and criteria that assess the learner on posing questions or on furthering or stimulating the discussion with questions. These stimulate interactive behaviours by encouraging learners to share and challenge points of view, which leads to conflict. This conflict may lead learners to work collaboratively to create new meanings (O'Malley, 1995).

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Garrison *et al* (2000) identified social presence as an important 'support for cognitive presence, indirectly facilitating the process of critical thinking carried on by the community of learners' (p. 89). They add that 'high levels of social presence with accompanying high degrees of commitment and participation are necessary for the development of higher-order thinking skills and collaborative work' (p. 94). Interaction can become collaborative when participants develop social bonds, or what Garrison *et al* (2000) refer to as 'the ability of participants in a community of inquiry to project themselves socially and emotionally, as "real" people' (p. 94). We found small numbers of criteria and ratings to assess social presence and conduct towards others.

Conclusions

The purpose of the study reported on in this paper was to identify the performance criteria and ratings used in rubrics designed for the evaluation of learning in OADs in post-secondary contexts. Designing assessments to rate mechanical aspects of writing may serve to increase the clarity of writing in the forums. However, our findings suggest that more research is needed to determine if this emphasis on the mechanical contributes to or detracts from the learner's ability to contribute in-depth analyses and reflections. Criteria and ratings that assess learners on mistakes in composition, spelling and grammar may indeed discourage timely and unselfconscious responses.

Performance criteria and ratings designed to describe and assess procedural and managerial elements of the discussion might be augmented by the inclusion of assessments of the length of posts, number of sentences or a minimum number of posts or words. These types of assessments may assist in the development of a more collaborative forum by encouraging learners to contribute more comprehensive posts and replies, which may lead to increased interaction. Rubric designers might also consider rating adherence to specific rules of conduct as a way of ensuring a collegial atmosphere where learners feel comfortable exchanging information with each other.

The transcript analysis literature emphasises the important link between social presence and the development of higher-level thinking skills. Many of the rubrics we examined did not assess social presence. The inclusion of performance criteria and ratings that emphasise interactions with others, particularly the ability to share reflections, insights, information and resources with other members of the group, may aid in social bonding and lead to increased cognitive activity.

Further inquiry might determine if learners do achieve higher level thinking skills when rubrics are used. For example, learners could be given rubrics and task exemplars at the beginning of the period of instruction. Formative assessments could be completed at specified intervals using the rubrics, and a summative assessment could be performed after the period of instruction using transcript analysis.

We found that the majority of the rubrics we examined assess learners on participation, interaction, collaborative and social behaviours, and cognitive development. We determined that the rubrics do look for evidence of these behaviours, but we do not

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know if learners assessed by those rubrics did experience an increase in, for example, cognitive development. Researchers might wish to create and use a rubric to track progress in one or more OADs, then analyse the transcripts of the discussions to try to determine if learners did achieve benefits. If benefits are found, additional research might help us to determine how to exploit the potential of the rubrics to achieve maximum benefit.

We collected only those rubrics that were available over the World Wide Web during the period of this study. We used only the Internet for collection of rubrics and did not consider rubrics from other sources. We examined only rubrics written in the English language, which may also have affected our findings. Additional studies might be undertaken which collect rubrics from other sources or directly from instructors.

Our analysis did not take into consideration the weights and scales, scoring schemes or the attributes used in the rubrics because we collected the rubrics to describe and compare the performance criteria and ratings to indicators developed from a review of the relevant literature. A consideration of the weights and scales and scoring schemes may have given us more insight into the importance the rubric designers attached to each criterion and its associated ratings. For example, we may have found that some designers weighted the assessment of cognitive behaviours more heavily than, for example, adherence to rules and procedures.

We did not interview the rubric designers as to why specific criteria and ratings were included in the rubrics. It would be of interest to determine why the designers of the rubrics chose the criteria and ratings they did and what factors influenced their decisions. For example, why did some designers include a mix of cognitive, interactive and procedural criteria and ratings in their rubrics? It is possible that some instructors use rubrics to attempt to guide learners from participation to interaction, and then to cognitive skill development. They may rate participation more heavily at the start of the instructional period, encourage interaction and then look for evidence of collaboration and critical thought.

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