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**E-Moderating in On-Line Problem Solving: a new role for teachers?**

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# E-Moderating in On-Line Problem Solving: a new role for teachers?

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## SUMMARY

*Within UK higher education there is a great deal of interest in the role of the on-line moderator (e-moderator). Many tutors new to on-line teaching, without the appropriate background or any experience of on-line learning, are now asked to contribute to the development of their institutions' on-line courses (e.g. Bennet & Marsh, 2002). While the idea of e-moderation appears as a design challenge for tutors and teachers who want to move online, there are many unanswered pedagogical questions regarding the role of the e-moderators and their effectiveness in different learning contexts. This paper reports on issues arising from a pilot study, as part of a Ph.D programme, that tested two different e-moderation styles: 'Low' or non-directive style and 'High' or directive style. Research on e-moderation was carried out in a Scottish university with a sample of 38 undergraduate students in a problem solving course. The course was taught with a mixed instructional strategy which included an on-line asynchronous discussion system. The research focused on the way moderation style (**High** and **Low**) influenced the learners and the process of learning.*

**KEYWORDS:** *e-moderation, on-line learning, problem solving.*

## BACKGROUND

### General Educational Context

The importance of on-line learning and the delivery of courses cannot be over stated. In the United Kingdom, almost every institute of higher education offers on-line courses (Hawkrigde, 2003). In some cases these simply comprise web-based course notes; in some cases the total course is delivery using a form of synchronous or asynchronous Virtual Learning Environment [VLE] (see for a review, BECTa, 2003). While there are recognized approaches to designing traditional courses for students, there is considerable evidence on the way on-line courses are designed and delivered. There is little focus on the pedagogic or instructional models for tutor lead asynchronous VLE courses. (e.g. Collis & De Boer, 1999) There appears to be an assumption that tutoring on-line is the same as tutoring face-to-face (F2F) and little attempt has been made to re-conceptualize the tutor or e-moderators role. (Anderson et al, 2001) There is one major exception

(e.g. Salmon, 2000 & 2002). Salmon has provided a framework for understanding the e-moderator's role - however her framework is based on a particular style of moderation. This style is mostly in tune with open and distance learning and personal development planning. The style while common is not ubiquitous. Our research, on which this paper is based, aims to develop a comprehensive e-moderation framework. (Vlachopoulos, 2003).

### **On-line Learning and Moderation**

We developed a working framework for e-moderation based on a variety of existing frameworks (Mason, 1991; Berge, 1995; Salmon, 2000; Garrison & Anderson, 2003). In study reported here, two distinct approaches for e-moderation were defined: a '**Low**' or *non directive* moderation style and a '**High**' or *directive* moderation style. In a 'Low' moderation treatment, the tutors were asked to intervene in the on-line discussion that the students were taking part in, in order to help them 'reflect' while progressing their discussions. Their role, was to 'sit back' in the on-line classroom and monitor the progress of their students and only intervene to take the discussion further. This approach is close to the concept of facilitation or chairing (e.g. Salmon, 2000) In the second treatment - '**High**' moderation - the tutors are asked to intervene in *both* the process of the on-line problem solving and in the content as well. Tutors are asked to adopt a '*directive style*' of on-line tutoring. This directive approach is based in part on the recommendations of Garrison & Anderson (2003), who consider the e-moderators as:

*".. teachers who design, facilitate and direct the cognitive and social processes for the purpose of realizing personally meaningful and educationally worthwhile learning outcomes(p.49)".*

### **Learning to Learn**

So far, the focus of this paper has been on the tutor or teacher. If students are to make the most of their opportunities to learn, then they too will have to adapt to new learning contexts and perhaps acquire a new skill of "*learning to learn*" (e.g. Brandes and Ginnis, 1986). There is still a lot of debate within this area as to the nature of learning or study skills. (e.g. McKeachie, Pintrich & Lin, 1985; Hattie, Biggs & Purdie, 1996) However, one agreed factor is the need for learners to **reflect on** the process of learning. *Reflection* is becoming a dominant theme in study skills work and in the design of courses - including the use of reflection journals (Moon, 1999). A useful framework for describing the experience of learning that includes reflection is the Kolb Experiential Learning framework. (Kolb & Fry, 1975; Kolb, 1984). While there have been criticisms of the framework and in particular the inventories used to classify individual learners preferences for learning "style", there is sufficient validity in this general approach to use it as a background context for on-line learners (see, Sewell, 1986; Riding and Raynor, 1998). We have speculated about the relationship between students who express a preference for a "Reflective" style of learning against those who express a preference for an "Active" style of learning. In order to encompass this variable in our study on e-moderation, we examine interaction effects between students preferences to be Reflective or Active in response to the e-moderators approach to tutoring. This we carried out within a study skills context.

### **Problem Solving**

Problem solving is a generic study or learning skill that is taught in study skill courses and embedded in subject-based courses. Jonassen, (1997) has offered a comprehensive classification of problem solving. His argument, in summary, is that problem solving ability is *a function of the interaction between problem variation* (e.g. **ill-structured** vs **well-structured**), *representation of the problem* (e.g. **context** - historical, cultural) and *individual differences* (e.g. **cognitive style**). This classification allows us to adopt an on-line problem solving activity within a course on problem solving to individual differences (based on the learners engagement with experiences -

*Reflective Vs Active*) and problem variation. The issue of problem variation is tackled here as a matter of *determinate vs indeterminate* problems. In essence, the difference being the number of alternative routes through the process of problem solving and the number of possible solutions is limited in the determinate problem where as in the indeterminate approach, more "variation" in process and solution is possible.

### **Instructional setting for Problem Solving**

McAleese (RMcA) teaches a course on problem solving at Heriot-Watt University in Scotland. The course is taken by undergraduate students from different Faculties. The basic structure has been developed over ten years and is supported by what McAleese calls a "*Serious Fun*" framework. In 2002-2003 the module, as part of an annual re-design, was set-up to permit on-line problem solving to be encountered. This approach was to accommodate the growing interest in on-line learning experienced by students. The course comprises a 8 week teaching block comprising a core workshop (2 hours) followed by a face-to-face (F2F) problem based learning tutorials each week and five weeks of on-line activity. An on-line discussion system [[www.discusware.com](http://www.discusware.com)] supported the students and the tutors (E-Moderators). Students encountered determinate (c.f. Jonassen = well-structured) as well as indeterminate (c.f. Jonassen = ill-structured) problems in the course. In this study, students worked on an indeterminate problem in an on-line environment.

## **THE STUDY**

The study we carried out in 2003 aimed to investigate the difference in approach between directive and non-directive tutorial style and students' approach to determinate problem on-line. Students were characterized as being more or less reflective using a version of the Kolb Learning Style Inventory (LSI).

### **Participants**

#### **Students**

Students (n=38) were allocated to seven groups. The allocation of the students to groups has been made on the basis of their responses to the Kolb Learning Style Inventory (Kolb, 1984). This version of the Learning Style Inventory (LSI) had been scored to give each student the following scores: CE, RO, AC, AE, AE-RO & AC-CE. The AE-RO scores were used to form three broad types of groups (Active, Reflective and *mixed* Reflective and Active). This gave seven groups of five or six students each.

#### **Moderators**

Four tutors volunteered to moderate the on-line discussion on an indeterminate problem. Two of the tutors were based in the University of Colorado at Denver<sup>1</sup> and two in the School of Education at Aberdeen University. All of the tutors had previous experience of on-line tutoring. Only one tutor had experience of problem solving. This e-moderator was requested **not** to draw on his experience in the approach he was allocated. The e-moderators were asked to keep a contemporaneous reflection record of their thinking about the tutoring throughout the on-line tutoring.

## **RESEARCH METHODS**

A semi-qualitative approach was adopted to collect data to help understand the style of e-moderation adopted and the response from learners. A coding scheme was developed by PV to

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<sup>1</sup> Two colleagues of RMcA from the University of Colorado volunteered to be 'distance' on-line tutors. One is an experienced instructional designer who teaches Problem Solving and Problem-Based-Learning (PBL), the other is a doctoral student in the area of PBL.

measure the on-line teaching presence of tutors (e-moderators). The content analysis was based on a coding system developed by Anderson, Rourke, Garrison & Archer (2001). Our system has three broad categories (Instructional Design and Organization, Facilitative Discourse, Direct Instruction) and an 'Other' <sup>2</sup> category. There are 20 sub-categories. The on-line messages posted by the E-moderators were segmented into 206 'meaningful units', following a methodology developed for Verbal Data Analysis (Chi,1997). All meaningful units were coded using the modified coding scheme of Anderson *et al* (2001). A test-retest reliability check of the coding was undertaken using an independent coder who had training in the application of the category system. A Cohen's Kappa of 0.77 was computed. <sup>3</sup> Further, a qualitative content analysis of the reflection journals of the e-moderators was undertaken. All four reflection journals were analyzed in order to extract data for the e-moderators' attitude to their on-line role as moderators as allocated to them. The *coding unit* in this case was the '**syntactic unit**' (*sentence*). Each paragraph of the reflection journal was segmented into sentences, which were then coded into 2 main categories {Positive Attitude (PA) and Negative Attitude (NA)}. No further analysis of the e-moderator's comments were made for this study.

## DATA

Data were analyzed in the first instance without the assistance of a computer to allow a familiarity with the discussions and the categories adopted by the e-moderators and the learners. Subsequently, we have used computer assisted data analysis software, NVivo 2 to re-analyse the 'teaching presence' of the e-moderators and their reflections from their learning diaries. The computer analysis allows a more systematic insight in both the on-line transcripts and the reflective diaries. We do not report in full on this analysis here.

## THE FINDINGS

### General

There are two themes that we want to draw out from our analysis of the data. First, the on-line participation within the 'low' and 'high' moderated discussion groups, and second, the role of the 'high' and 'low' moderators as it was displayed in the on-line discussions and as it was evaluated by the moderators themselves.

### Participation

There was a significant difference in terms of total participation between the 'High' and 'Low' moderated groups, with the 'High' moderated groups contributed almost twice the number of the messages of the 'Low' groups (*see Figure 1*). In addition to this, we found that the students' messages of the 'low' moderated discussions were further out of the particular content of the problem solving process than the students' messages of the 'High' moderated groups. This finding supports the Anderson's and Garrison's argument for on-line tutors who are experts in the subject domain that they 'teach'. Being a subject expert helps the tutor to establish a 'teaching presence' on-line (Garrison & Anderson, 2003). However, the quantitative analysis of the data does not provide any evidence of interaction between tutors and students in the groups and it is difficult to detect the impact of the e-moderators in the actual development of the students learning. Therefore, there are no assumptions we could make about the impact or effect of the e-moderators on the student's learning in discussion forums and the quality of interactions among learners. A further analysis of the data is required to investigate whether the moderators' messages were

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<sup>2</sup> The category system is therefore inclusive of all the recorded utterances. The 'Other' category "collects" events that are **not** part of the research reported in this paper.

<sup>3</sup> Any value over 0.75 is suggested as acceptable reliability (Riffe, *et al*, 1998).

perceived as '*teaching presence*' or not.

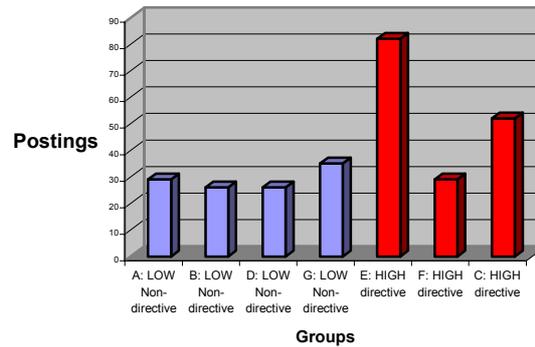


Figure 1: Participation within the reflective groups

### The E-Moderators

In comparing the contributions made by moderators, we found that there are similarities and dissimilarities in both the 'Low' and the 'High' style of moderation.

'Low' moderators were asked to take on the role of a non-directive, reflective moderator. They were asked to be non-interventionist and not to seek to secure the participation of students by chasing them with requests to participate. This moderation style is evident in their on-line discourse: Short messages, mostly to reinforce students' contribution, unconditional feedback and judgments given without explanation or justification were the most frequent contributions of the low moderators. However, we did not have a way to examine the criteria under which the moderators declare the judgment e.g. "Very positive" or "Well done". There is no indication from the evidence we have as to the intent (e.g. being helpful) of these comments. The suggestion is that a negative comment would not be valued by the learners if it was provided without further clarification by the e-moderators. So, how can e-moderators assume that positive comments are valued by the students?

As far as the 'low' moderation role is concerned, the moderators reported in their reflective journals that this role was very restrictive. One of the moderators commented that: "... I felt I could only ask questions and that I could not make any other form of contribution. But worst still, what influences were to inform my choice and framing of questions? Should I assume a knowledge of the PBL processes or model being applied? Were my questions to help students deploy such a model? I thought not. Could I offer subject knowledge? I thought not ....". The doubt raised here is important. To this e-moderator moderation may be another term for teaching? Is the moderator, acting as a *teacher* when the conference is designed to serve a learning purpose?, Moderators were not asked to act as teachers. We should report that this instruction was something that puzzled the e-moderators. It appears that their expectation was that, no matter what they were called that they would have some "teaching" function. Further, the second 'low' e-moderator was not clear about the effectiveness of the style adopted. This moderator asked in the learning journal "... what were my questions designed to do? I was very unclear. Reflective questions I thought should help learners reflect on the processes they were using to support learning...I did not feel that the students saw me as a source of help. When they did ask for help it was on specifics of content that I was not allowed to offer ...". Subsequent analysis of the data using NVivo 2 reveals

that the moderator had a 'negative attitude' towards his 'low' moderation role which was displayed on-line with short contributions and comments without explanation or justification. In addition to this, the moderator had prejudged the 'failure' of one of his group to solve the problem (in a comment from his learning journal), but he did not take any particular action to prevent this 'failure'

High moderators, on the other hand, were asked to intervene in both the process and the content of the on-line activity. However, neither of the two high moderators followed the instructions completely. The first 'high' moderator, whose postings were coded initially (by hand) as 'Directive', appeared knew too much about problem solving and it appears that the moderator was steering the group to the solution by making direct content inputs to the discussion of the students. The NVivo 2 analysis reveals that his discourse was in fact much more 'facilitative' than the style of moderation we wanted him to bring about online. The moderator reported in his reflective journal that he was looking to work in a metacognitive level and that he wanted to be 'directive' at this metacognitive level while he would prefer a more facilitative role at the early stages of the on-line activity. This was difficult for a number of reasons. First, the time for the on-line activity was limited to allow metacognitive activity to take place and second, the instructions given to the high e-moderators called for a directive teaching style. All these resulted to a 'confusion' as to what does it mean to be 'directive' or 'facilitative' when a moderator works in different cognitive levels and when the moderator sets different aims to meet particular outcomes. This finding would argue against the single facilitative role suggested by Salmon for all five stages of her E-moderation framework. (Salmon,2000). The second of the 'high' moderators reported in her reflective diary that she became confused and she was acting as a low e-moderator for the first two weeks of the on-line session. However, when the moderator contacted the teacher of the course (RMcA) she was advised to shift to a more 'directive' role. The shifting from the low to a more high moderation treatment gave a push to the group's contributions. The groups of the specific moderator contributed the highest number of postings. (see Figure 1: groups C and E).

We could not generalise here and support that low style moderation is always non-directive and high style moderation is always directive. Some scholars (Bonk & King, 1998; Salmon, 2003; ) remind us the concept of moderation in terms of facilitating, coaching, and guiding and they suggest that we could do high level moderating in indirect way. In our study the term 'low' and 'high' moderation style refers better to the level of the e-moderator's involvement during the particular on-line activity rather than to a generic 'style'.

## DISCUSSION

A general 'negative tone' of the whole on-line activity was expressed in most of the moderators' comments. They had an experience for which they did not seem very well prepared. They did their best to follow the framework given but it did not seem to work out. The e-moderators drew conclusions about their e-moderation practice from the on-line 'teaching' experience, which are full of the "need" verb (referring to their needs as e-moderators and not the needs of the students) and imperatives that would have to be satisfied for this to work. This general 'disappointment' and confusion is evident in the on-line transcripts and their learning diaries. It became clear that e-moderation in order to be 'effective' needs to be 'open' and 'adaptive' to different learning contexts, but in the same time needs to remain focused on particular learning outcomes. It appears that by simply devising and using a given or suggested framework, the e-moderator still needs to know the purpose of the activity and needs to be ready to modify it for his/her practice. Further, there was a request throughout the on-line activity from the e-moderators for extra support that was expressed with individual e-mails to the instructor of the course. It appears that a support 'mechanism' that would allow reflection and negotiation of used and suggested practices among e-moderators could add value to this new 'role'.

## CONCLUSION AND FURTHER WORK

In this paper we have offered a brief insight in the emerging practice of e-moderation. Our study had limited aims, however it does suggest some important lessons. First, the need for a generic definition of “e-moderation”. We would suggest the following working definition as a starting point: “... e-moderation is an activity in which someone, not necessarily the teacher, facilitates a discussion in the virtual environment, making interventions that are designed to encourage the discussants to engage with and achieve an overall aim”. The key concepts are “**facilitation**”, “interventions” “**encouragement**” and “**engagement**”. There is a fine line between facilitation and direction. There is also a fine line between encouragement and direction. We make no judgement about the pedagogy of “direct” teaching. We recognise that the asynchronous nature of mediated discussions require that all participants clarify their roles. There is also a need for a comprehensive framework that includes naturalistic contexts. Too many educational innovations lack the contextual complexities of naturalistic studies. When working with learners on credit bearing courses, there are added pressures on tutors and moderators to meet the perceived needs of the system and of learners. Asynchronous on-line discussions are not “.. tutorials that run on for a few weeks ...”. The potential for learners to make the most of the asynchronous discussions is yet to be achieved. So far we have seen little attention to the conceptual time-space afforded by asynchronous problem solving. We suggest that this needs to be encompassed in advice given to tutors and in training given to learners. Our future work will aim to further examine the nature of e-moderation and to allow for moderation strategies and tactics to emerge from active practitioners (e-moderators) in ongoing courses. The future study will aim to explore both the ‘process oriented e-moderating’ and ‘the content oriented e-moderating’ by trying to investigate the effect of the various e-moderator’s leadership types (e.g. director, guide, clan, entrepreneurship) on learning.

Our studies should offer further insights on the opportunities that are emerging for e-moderators to draw on personal and professional experience to help them develop themselves as members of electronic learning communities.

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