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WIDENING THE CIRCLE - MANAGING DISCUSSION FORUMS IN A GROWING ONLINE PROGRAM

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Abstract

Swinburne Astronomy Online (SAO) is an online graduate program with students and instructors located in over 30 countries around the globe. The use of asynchronous, assessable discussion forums is a central feature of SAO. These 'online asynchronous tutorials' were introduced partly with the intention of breaking down the isolation of distance education, but mainly to encourage active learning in an online education format.

SAO has now completed nine semesters, student numbers have increased steadily and instructors have come and gone. Innovative teaching programs can fall into the trap of being manageable when small, only to have quality control become an issue as enrolments grow. Initial enthusiasm of both students and instructors can die down as the novelty wears off. However in the case of SAO, as the program has grown, the format used for discussion forums has proven to be scaleable and remains a central, highly popular feature of SAO. Coordinating and training geographically dispersed instructors requires careful thought and planning, however student and instructor enthusiasm remains high.

Keywords

Computer-mediated communication, teaching/learning strategies, online education, distance education, asynchronous discussion forums.

Background

One of the advantages that online education has over other forms of distance education is the ability of instructors and students to interact via online discussion forums. A number of studies are starting to be published both on the social and pedagogical aspects of discussion forums (Hiltz, 1994; Eastmond, 1995; Hiltz, 1998; Paloff & Pratt, 1999; Salmon, 2000; Paloff & Pratt, 2001) and on the design of online learning environments generally (Jones & Buchanan, 1996; Harasim, 2001). However as online education is a relatively new field, until now there has been little opportunity to study whether the use of discussion forums is scaleable in a growing online program.

Swinburne Astronomy Online (SAO) is a fully online, postgraduate suite of Masters/Graduate Diploma/Graduate Certificate astronomy courses offered by Swinburne University of Technology, Australia. SAO involves a hybrid online delivery strategy, combining high bandwidth course content on CD-ROMs with access to online, asynchronous communication and web resources. The assessment mix is typically made up of computer-managed testing, essays, project work plus contributions to the asynchronous discussion

forums (Mazzolini, 2000; Mazzolini, 2002). In semester 1, 2003, SAO was in its ninth semester, with an enrolment of approximately 270 students resident in 34 countries. The authors are the current Coordinator (SM) and the original designer and Coordinator (MM) of SAO.

A key feature of all SAO units are discussion forums where students are divided up into groups containing up to approximately 30 students per instructor, each group with its own set of discussion forums. A new forum is opened up every two weeks during the teaching semester. In each forum, students are required to post at least one question or 'extension comment' on any aspect of the current course material, plus answer at least one question posed by someone else. In the forum discussions, students clarify their own understanding of key concepts and further develop their science communication skills by answering each other's questions, often in considerable depth. Postings vary from quick responses to lengthy crafted contributions which have required significant amounts of background research. At the end of the teaching semester, SAO students are asked to nominate which three of their discussion forum postings are to be assessed on the grounds of correctness, clarity, information content and originality. The discussion forum component of the final grade (up to 30%) is made up of marks awarded for the nominated forum contributions, plus a smaller 'participation mark' component intended to reward regular high-level participation.

Of necessity, discussion forums in SAO are asynchronous, as the students (and instructors) are located across the world's time zones and tend to be busy people. Conversation 'threads' (topics) build up on the forums as geographically separated students come online in their particular time zones. In synchronous discussions of any size it is easy for discussion threads to become hopelessly entangled. However, in asynchronous forum discussions, each discussion thread is clearly organised under its own heading, which is an extremely important consideration in a forum with thirty or so active contributors. It may be that synchronous communications will prove to be effective in supporting the social side of student interactions, but that asynchronous forums are better at dealing with the 'academic' aspects of online programs (Motteram, 2001). In SAO it has become evident that asynchronous discussion forums give students (and instructors) time to research and reflect upon current discussion topics before they post answers to each other's questions.

The SAO program offers an excellent opportunity to study forum participation by students and instructors over several semesters. With a growing number of forums being conducted 'in parallel' in any semester, although the astronomy course material may vary from unit to unit, all SAO forums are conducted with the same overall guidelines and assessment criteria. In Semester 1 2003, the eight SAO units on offer that semester involved 12 instructors, as 3 of those units had sufficient enrolments to be split into separate discussion forum streams. (Major project units are also offered, but as their format is substantially different to that of 'regular' units, they are not included in this study.)

SAO instructors are professional astronomers, made up of a combination of in-house academic staff and external instructors (approximately 2/3rds external in all) who are employed full-time at observatories, universities or research institutions around the world. These instructors have widely varying levels of background teaching experience and of necessity require training from the other instructors and the Coordinator via email discussions. The Coordinator's task is to provide as uniform a teaching approach as is possible (and appropriate) across SAO units. Instructors are encouraged to act as 'guides on the side', aiding the discussions by contributing extra information and follow-up questions and intervening in discussion threads that have lost their way, while avoiding dominating the discussions. As one of the first SAO students commented "It's more like the classic Greek form of tuition, with the course tutors and students sitting round a forum discussing the subject." The aim is to encourage students to see the student group as a resource to obtain answers to each other's questions, rather than relying on the instructors as oracles. Our research has indicated that if instructors take too high a profile in discussions, they can tend to limit student participation and cut short the length of the discussions (Mazzolini & Maddison, 2003).

In our previous studies we investigated what effect differing rates of instructor participation have on student participation and attitudes to forums and SAO generally (Mazzolini & Maddison, 2003). We also studied how assessment of forum participation fits in with the overall SAO assessment mix (Mazzolini, 2000; Mazzolini, 2002), how women participants in SAO perceived their rate of participation, and how

that perception compared to a statistical analysis of newsgroup participation (Mazzolini & Maddison, 2002a). In related studies we are looking at the participation of non-native English speakers in SAO discussion forums, and continuing our research into how the style as well as frequency of instructor postings affects student participation.

As SAO has grown, discussion forums have remained a central feature of SAO, but the accommodation of increasing numbers of geographically dispersed students (and to a lesser extent, instructors) has required careful coordination and planning. In this paper we discuss how well the use of discussion forums in SAO has coped with growing numbers of students and the inevitable turnover in instructors with time, from the point of view of quality control and management but also of student participation rates and responses to the program.

Widening the Circle

Learning to Teach Online

SAO began as a small pilot scheme, offering a Graduate Certificate in Astronomy in its first two semesters in 1999. Approximately 50 students enrolled and were taught by two instructors. One of these instructors was the initial Coordinator and program designer (MM) who was located in at Swinburne's Hawthorn campus in Melbourne, and who had previously studied in an education program online with another university. Although the organization and details of the two online programs differed widely (particularly the emphasis on the use of discussion forums), the experience of being an online student and its associated benefits and frustrations was very valuable in designing and implementing a new online program. The second SAO instructor was a senior professional astronomer (Professor Ray Norris) located in Sydney. During that first year, despite being geographically separated, the two SAO instructors found that they could work closely together, discussing between themselves via email what learning and teaching strategies did and did not appear to work and frequently monitoring each others' discussion forums. Student feedback was continually sought, informally by email and through forum discussions as well as through more formal university surveys. These initial SAO students were aware that they were participating in a new form of education and many were keen to provide valuable feedback about their experience.

After the success of the pilot scheme, the Masters in Astronomy was launched in 2000 and more instructors located in several countries were employed to teach the growing numbers of SAO students. The experience of the first two instructors was shared informally among new appointees via email. New instructors were encouraged to monitor forums conducted by more experienced instructors and also to contribute their perspectives on what teaching approaches seemed to be most effective. The Coordinator's role increasingly became dominated by monitoring the teaching taking place in the growing number of SAO forums, responding to queries from new instructors and offering advice where necessary, and managing the assessment of forum contributions by instructors. The Coordinator originally reminded instructors of requirements and deadlines via an email mailing list, but this was soon supplemented with the creation of a (password protected) instructors' website.

As the number of classes in SAO has increased (see Figure 1), 26 instructors have taught into the program at various times. Attracting and training new instructors (all trained research astronomers or space scientists) has become an important management issue. Due to competing commitments, external instructors come and go from the program, so recruiting and training new instructors is a constant job. Many external SAO instructors are young, enthusiastic astronomy researchers who may have little or no teaching experience, and see teaching for SAO as an attractive way for them to gain that experience. While a lack of background in teaching is never ideal, it often means that these instructors are very open minded about trying new teaching approaches online, and their enthusiasm and astronomy expertise are definite pluses. The fact that instructors act as 'guides on the side' and students try to answer each other's questions in the first instance, makes it relatively easy for new instructors to 'find their feet'.

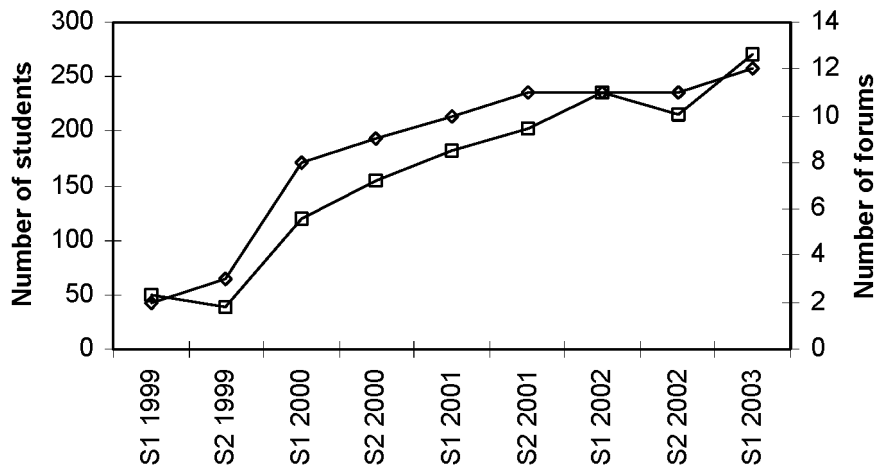


Figure 1: The growth in the numbers of students enrolled (squares), and the numbers of (non-major project) discussion forums held (diamonds) in Swinburne Astronomy Online over its lifetime from Semester 1 1999.

The training of new SAO instructors hasn't yet become as formalized as in large-scale organizations like the Open University (Salmon, 2000). When a new SAO instructor is recruited, training is usually either over the phone or via email, with instructions of how the program works and what is expected of the instructors plus tips on how to effectively run discussion forums and how to deal with challenging students. Access is also given to the discussion forum archives for a previous semester's class so that they can learn by example. Increasingly, information gained from our research on how to effectively run a discussion forum (e.g. Mazzolini & Maddison, 2002a, 2003) is also fed back to the instructors, as is feedback from student surveys. To help streamline the training process, the instructors' website for both new and old instructors has been expanded and now contains information such as contact details, important due dates during the semester, and a checklist made up of tasks that instructors are expected to carry out in each 2 week period during the semester. The instructors' website also includes marking criteria for the various assessment tasks, class lists, and tips for new instructors on how to run a fabulous discussion forum! In 2003, as part of a new sessional staff project at Swinburne, a special website is being developed as a resource for sessional staff, including SAO external instructors. The site includes learning and teaching advice and links, information for beginner instructors and case studies of successful Swinburne sessional teachers including a SAO instructor.

Swinburne University requires that each unit must have a Subject Panel that meets at least three times a semester to ensure that everything is running smoothly. In these Subject Panel meetings (which in SAO are conducted via group emails), instructors discuss the assessment criteria and any problems encountered during the semester. These email Panel discussions have proven to be surprisingly effective ways to share ideas and discuss online teaching techniques between the instructors, and for the Coordinator to seek and receive suggestions for improvements.

Gaining Feedback on SAO

Gaining effective student feedback - which is vital to the successful development of any teaching program - poses some challenges in a fully online program such as SAO where students are located around the world and never attend on-campus activities. SAO solicits student feedback in a number of ways.

Like all Swinburne University students, SAO students complete a confidential survey that asks them a variety of questions about their satisfaction with their courses and instructors, seeking to establish what they liked and what they didn't. As well as choosing between multiple-choice Likert-scale responses, students are also provided space in the survey to give their own comments, arguably the most useful aspect of the survey. Up to recently, these surveys have been distributed (and returned) by email and have achieved response rates typically of only 30 to 40%. A web-based online delivery of the original survey was trialled with SAO in 2002, but response rates were disappointing. However in 2003 a shorter web-

based version was trailed, and achieved response rates of approximately 75% on average, so it seems that the length of the survey may possibly have been the major discouraging factor in the past.

SAO also provides a “feedback forum” for its students, where students may post comments about how the course is going at any time during the semester. The Coordinator occasionally posts specific questions to this forum to gain feedback about specific issues. Students are also encouraged to provide any feedback they wish to remain confidential via email directly to the Coordinator at any time but particularly towards the end of each semester,

Each of these approaches allow students to provide useful feedback to the Coordinator, but given that response rates have been mostly on the low side, there is always the unresolved issue of what do the group of students who do not chose to respond think of SAO. To some extent, retention rates provide a final form of feedback - and in SAO the vast majority of students return to their studies from one semester to the next, which must indicate that the SAO program is doing something right!

Anecdotal qualitative feedback from instructors and students (and Coordinators) is valuable but by itself is limited. The SAO archives of discussion forums and student survey results provide a growing resource that can be used to make statistical analyses of SAO forum postings and student survey responses. The data analysis part of this project involved studying student and instructor participation in SAO discussion forums, plus student responses to course evaluation surveys conducted by the university each semester with Ethics Committee permission.

Changes In Forum Participation And Student Perceptions With Time

As SAO has grown from 50 to 270 students per semester, the average number of students in each discussion forum has stayed roughly constant at approximately 25. The hope has been that the SAO structure would prove to be scaleable so that the student experience would remain essentially the same, while the overall numbers of students, instructors and forums has grown from semester to semester.

In order to study whether SAO student and instructor participation and perceptions have changed over time, we analysed 5 semesters of discussion forum archives using the same indicators as in an earlier study (Mazzolini & Maddison, 2003): student posting rates, average length of discussion threads, percentage of instructor postings in each forum, and percentage of discussion threads started by instructors.

Judging the ‘health’ of a discussion forum by the rate at which students make postings and the length of their discussion threads may be misleading (Mazzolini & Maddison, 2003). Arguably, short discussions may indicate clarity in teaching materials rather than student disinterest, and long discussions may just be signals of confusion! However we can still use student posting rates and discussion thread lengths as indicators to look for changes in the way students participate in SAO forums. In a similar way, the relative numbers of instructor postings and the number of discussion threads initiated by instructors are (admittedly simplistic) indicators of the degree of instructor participation in forums.

	S1, 2000	S2, 2000	S1, 2001	S2, 2001	S1, 2002	Significance of variation?
Student Posting Rate	2.93 (.57)	4.26 (.59)	4.14 (.59)	4.28 (.74)	4.29 (1.32)	0.007 (mildly significant, $p < .01$, effect size $\eta^2 = 0.27$)
Average Thread Length	2.5 (.27)	3.0 (.33)	3.1 (.49)	2.7 (.63)	2.9 (.61)	0.159 (not significant)
% Instructor Postings	19.2 (7.3)	15.9 (4.4)	16.9 (6.0)	17.3 (8.3)	16.5 (7.7)	0.895 (not significant)
% Threads started by Instructors	11.5 (6.5)	9.6 (3.5)	10.8 (4.9)	10.1 (6.1)	10.7 (6.1)	0.964 (not significant)
Forum size	23.1 (4.6)	27.8 (6.9)	24.3 (5.3)	23.4 (5.1)	25.7 (5.4)	0.382 (not significant)

Table 1: SAO statistics over 5 semesters for student posting rate, average thread length, percentage of instructor postings, and percentage of discussion threads started by instructors. Also included are statistics on average forum size over time. In each case the standard deviation is shown in brackets, but as an indicator of the spread of the results only.

Table 1 shows semester-averaged results for each SAO discussion forum over 5 semesters, together with the results of ANOVA (one way analysis of variance) tests. As we can see, although the program size and the number of forums conducted per semester has grown steadily, the percentage of instructor postings and the percentage of discussion threads started by instructors in forums did not change significantly over the 5 semesters studied. The average discussion thread length and the average size of discussion forums also showed no significant variations.

The average student posting rate to forums did increase significantly (though the effect size was small), but this was due to an increase in posting rate over the first two semesters studied. Once the first semester is removed from the analysis, there is no significant variation over the other semesters studied. Prior to 2000, a Graduate Certificate program had been offered with an enrolment of approximately 50 students. The first semester studied in this project (S1, 2000) was the first semester in which the Masters program was offered and the enrolment doubled in size, with a corresponding increase in the number of instructors. Given this sudden influx, it may have been the case that new students and new instructors took a while to adjust to the discussion forum format and to participate fully and effectively. However from Semester 2, 2000, the student-posting rate has stayed at approximately 4.24 postings per discussion forum - a high rate, given that SAO students are only required to make 2 postings per forum.

The Swinburne Foresight, Planning and Review Unit conducts confidential surveys of all Swinburne University of Technology students each semester. We analysed SAO student responses over five semesters to statements concerning the enthusiasm and expertise of their instructors, the usefulness of discussion forums (2 semesters only) and their overall satisfaction with the educational experience provided by SAO. All responses were given on a 1 (strongly disagree) to 5 (strongly agree) Likert Scale. The response rate is typically 30% to 40% on average for SAO students. These surveys are conducted independently of SAO, and student responses are provided to SAO in anonymous statistical form only.

	S1, 2000	S2, 2000	S1, 2001	S2, 2001	S1, 2002	Significance of variation?
Instructors enthusiastic?	4.69 (0.74)	4.68 (0.59)	4.12 (1.1)	4.29 (1.0)	4.15 (1.1)	0.000 (significant, $p < .001$, effect size $\eta^2 = 0.06$ only)
Instructors demonstrated expertise?	4.73 (0.56)	4.81 (0.46)	4.47 (0.84)	4.49 (0.81)	4.50 (0.65)	0.002 (mildly significant, $p < .01$, effect size $\eta^2 = 0.04$ only)
Usefulness of discussion forums	-	-	-	4.10 (0.91)	3.84 (1.0)	0.068 (not significant)
Overall satisfaction	4.49 (0.65)	4.58 (0.55)	4.22 (1.0)	4.44 (0.79)	4.30 (0.75)	0.023 (mildly significant, $p < .05$, effect size $\eta^2 = 0.03$ only)

Table 2: SAO statistics over 5 semesters for student responses to survey questions on enthusiasm and expertise of instructors and overall satisfaction with SAO educational experience, plus responses over 2 semesters to a survey question on the usefulness of discussion forums. Responses were according to a 1 - 5 Likert Scale, where 1=strongly disagree, 2=disagree, 3=neither, 4=agree, 5=strongly agree. In each case the standard deviation is shown in brackets, but as an indicator of the spread of the results only.

Survey response results for each discussion forum over 5 semesters are shown in Table 2, together with ANOVA tests for significance. SAO students rate the enthusiasm and expertise of their instructors, the usefulness of the discussion forums and their overall satisfaction with the SAO educational experience all very highly indeed. Apart from the ‘usefulness of forums’ question, which was only asked in the last two surveys studied, student responses to the other survey questions did decrease slightly from 2000 to 2001. It would be tempting to attribute this to a variation of the ‘Hawthorn Effect’ (Accel-Team.Com, 2001) and claim that a certain degree of initial enthusiasm with the new Masters program, associated with the feeling that students and instructors were participating in a brave new educational experiment, wore off with time. However the effect size is tiny and only a few percent of the variation in responses observed can be explained as strictly due to variations with time. At any rate, SAO student responses to these survey questions remain very high, indicating a continuing high level of satisfaction with the SAO program.

Does Forum Size Affect Forum Participation?

In the previous Sections we discussed the issue of managing ever-increasing overall numbers of students and instructors in SAO forums as the program has grown. However the size of the ‘circle’ of participants in individual forum discussions also varies. SAO was originally designed assuming that there would be a maximum number of approximately 30 students per discussion forum. Although it is sometimes claimed that the use of intelligent software to answer routine questions will allow forums to be conducted with perhaps 100s of students per instructor (Taylor, 2001), our experience both as online Coordinators and studying online (MM) suggests otherwise. We suggest that higher level learning requires good access to real (if online!) instructors, and that postings by large student groups can ‘swamp’ discussion forums, making them unusable.

In practice, there seems to be optimal SAO forum sizes of about 30 students for the introductory units and 25 for the more advanced units. Forums with too few students (generally less than 20) place heavy demands on the instructor, because the number of postings is quite low and instructors feel they have to

work hard initiating new discussion threads and extending existing ones in order to encourage students to make postings. It is difficult for the instructor to gauge how the students are progressing through the course material if students don't post many questions or comments. If the class size is too large (generally over 30, or 25 for the advanced level units), instructors do not have the pressure of having to initiate discussions, but it proves to be extremely difficult for the instructor (and the students!) to keep up with over 300 postings per fortnight. The quieter students who may potentially be having problems can easily get 'lost in the noise'.

As we have discussed, another aspect of scalability of SAO relates to whether student and instructor participation and student responses to evaluation survey questions vary significantly according to the number of students in a discussion forum.

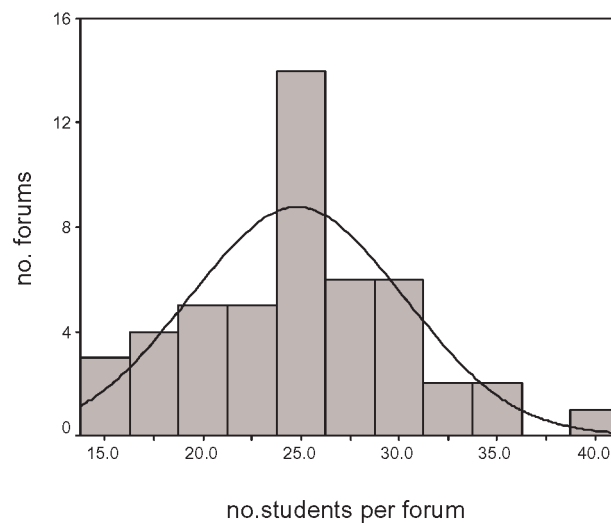


Figure 2: Histogram of the distribution of class size (number of students per forum) across all SAO discussion forums over 5 semesters.

Our discussion forums typically have an upper limit of about 30 - 35 students. As shown in Figure 2, forum sizes have varied from 14 to 41 (the latter occurring when two smaller forums lead by the same instructor elected to be merged). Over a total of 48 forums in the 5 semesters studied, the mean number of students per forum was 24.8 (standard deviation 5.45).

We have used our analysis of 5 semesters of discussion forum archives to investigate whether our indicators of SAO student and instructor participation and perceptions (see previous Section) vary significantly according to forum size. Note however that most SAO forums contain between 19 and 30 students, and so the power of our analysis for large as compared to small groups is necessarily limited.

We used Pearson R-value tests to investigate whether there was any significant correlation between indicators of student and instructor participation as a function of forum size. We found that there was no significant correlation with forum size for average student posting rate, percentage of instructor postings, or percentage of threads started by instructors. We did find a moderately significant positive correlation (Pearson R-value +0.447, $p < 0.01$) between average discussion thread length and forum size. Larger forums evidently mean that more students join in on any particular discussion thread, on average. Larger forums have the disadvantage of being made up of large numbers of postings to read (typically 200 or more per 2 week period), but apparently have the definite advantage of providing more extensive discussions on most topics.

As mentioned earlier, instructors of very small forums (less than approximately 20 students) tend to feel that they have to work hard initiating new discussion threads and extending existing ones, in order to encourage the relatively small numbers of forum participants to participate fully. Conversely, although they do not have to initiate threads to keep forums active, instructors of very large SAO forums (over

30 for introductory units, over 25 for introductory units) tend to report that they do have to work hard monitoring and responding to the often very large numbers of student postings in these forums. It was therefore interesting to find that no statistically significant correlation existed in our study between the percentage of instructor postings or the percentage of threads started by instructors, as functions of forum size. However, although it is not statistically significant, it is suggestive that the data shows that instructors of the two smallest SAO forums in the sample (with 14 and 15 students) did post at a higher rate and start more discussion threads than average. In contrast, instructors of the largest SAO forums so far (2 forums of 35 students and one of 41 students) did initiate less new discussion threads than average, as expected.

We also investigated whether there was any significant correlation between the number of students in a discussion forum and the student responses to the survey questions described earlier. Using ANOVA tests we found that there was no significant correlation with forum size for any of the student responses. While the range of forum sizes in SAO is limited, it is clear that we see no significant variation in student responses with forum size. Whether in relatively large or small classes, so far SAO students are apparently overwhelmingly happy with the usefulness of their discussion forums, the enthusiasm and expertise of their instructors, and SAO generally.

Conclusion And Outlook

As the SAO program has grown, its discussion forum structure has proven to be quite scaleable. Over the nine semesters so far, moving from two to twelve discussion forums operating side by side, plus a gradual turnover of instructors with time, have caused surprisingly few problems. Experienced students quickly become quite proficient at using forum discussions to good effect. Forums therefore tend to maintain their own momentum, given competent instructors and careful coordination.

In this study we have shown that simple measures of instructor participation in discussion forums, such as instructor posting rates and the number of threads started by instructors, have not changed with time. Neither have similar indicators of student participation, such as overall lengths of discussion threads and student posting rates. We found no correlation between these variables and forum size, though there was some indication that the length of discussion threads was longer in larger forums - as there were more students to join in each discussion - and that instructors in the very smallest forums posted at higher rates and initiated more discussion forums than average. As SAO has grown with time, students have remained very satisfied with the discussion forums, their instructors and their SAO educational experience in general. We believe that this is largely due to the continuing low student-to-staff ratio in discussion forums as the program grows, as well as our ongoing commitment to communication with and soliciting feedback from our students.

As the SAO program continues to grow, another important issue to consider is the management and moderation of assessment, a significant scalability issue in its own right. This study has not discussed the assessment of discussion forums at any length, although we have considered assessment issues in previous studies (Mazzolini, 2000; Mazzolini, 2002). As well as monitoring the way that discussion forums are running, the Subject Panel meetings between instructors invariably lead to discussion of assessment criteria and marking practices for forum assessment. The monitoring and moderation of marks for discussion forums in order to ensure that instructor biases do not dominate can be time consuming, and may potentially delay the process of returning grades and feedback to students. Assessment of discussion forums has high inherent validity, as students learning to communicate their understanding of astronomy concepts effectively represents a key learning outcome of SAO. On the other hand, reliability is always an issue, as is how best to provide students with useful feedback. In a future study we intend to look at how best to train new instructors to work closely to the assessment criteria and provide uniform and useful feedback to students, and we will also monitor marking reliability to see if it improves in the process.

References

- Accel-Team.Com (2001). *Elton Mayo's Hawthorne Experiments*. [Online]. Available: http://www.accel-team.com/motivation/hawthorne_01.html [3rd August 2003]
- Eastmond, DV (1995). *Alone but Together - Adult Distance Study through Computer Conferencing*. Cresskill, NJ: Hampton Press.
- Harasim, L (2001). Shift Happens: Online Education as a New Paradigm in Learning. *Internet and Higher Education: Special Issue*. UK: Elsevier Science 3 (2000): 41-61.
- Hiltz, SR (1994). *The Virtual Classroom - Learning without Limits via Computer Networks*. New Jersey: Ablex Publishing Corporation.
- Hiltz, SR (1998). Collaborative Learning in Asynchronous Learning Networks: Building Learning Communities, WEB98 Orlando Florida. Available: http://eies.njit.edu/~hiltz/collaborative_learning_in_asynch.htm [3rd August 2003]
- Jones, J and Buchanan, R (1996). *The Design of an Integrated Online Learning Environment*, [Online]. Available: http://cq-pan.cqu.edu.au/david-jones/Publications/Papers_and_Books/96ascilite/ [3rd August 2003]
- Mazzolini, M. (2000). Assessment Techniques in an Online Astronomy Course. *Publications of the Astronomical Society of Australia*, 17(2), 141-144.
- Mazzolini, M. (2002). The Use of Online Discussion Forums as a Learning and Teaching Tool in Astronomy. *Publications of the Astronomical Society of Australia*, 19(4), 448-454.
- Mazzolini, M. and Maddison, S. (2002a). Does Gender influence Discussion Forum Participation in Online Education? In A. Williamson, C. Gunn, A. Young & T. Clear (Eds), *Proceedings of the 19th Annual Conference of the Australasian Society for Computers in Learning in Tertiary Education, ASCILITE 2002*, (pp. 421-430). Auckland NZ UNITEC Institute of Technology Dec 2002
- Mazzolini, M. and Maddison, S. (2003). Sage, Guide or Ghost? The Effect of Instructor Intervention on Student Participation in Online Discussion Forums, *Computers & Education*, 40 (3), p. 237 - 253, 2003.
- Motteram, G. (2001). The Role of Synchronous Communication in Fully Distance Education, *Australian Journal of Educational Technology*, 17(2), 131-149.
- Paloff, R.M. and Pratt, K. (1999). *Building Learning Communities in Cyberspace - Effective Strategies for the Online Classroom*. San Francisco, Ca: Jossey-Bass.
- Paloff, R.M. and Pratt, K. (2001.) *Lessons from the Cyberspace Classroom - the Realities of Online Teaching*. San Francisco, Ca: Jossey-Bass.
- Salmon, G. (2000). *E-Moderating: The Key to Teaching and Learning Online*, London: Kogan Page.
- Taylor, J.C. (2001). Fifth Generation Distance Education. *DETYA's Higher Education Series*, Report No. 40, ISBN 0642 77210X

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