

# The impact of faculty interaction on the learning experience and outcomes of online learners



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The last decade has witnessed e-learning evolving as a major force in higher education delivery. The role of faculty in an e-learning educational environment is still debated. This paper reports the findings of a study of the role of faculty interaction in a pedagogically rich online environment, grounded in a constructivist model of learning. The study examines the results from 145 sections of graduate management programs, covering 2005, 2006 and 2007, and also covering quantitative, behavioural and hybrid subjects. The findings of this study support the arguments that faculty interaction adds value to learner perception and satisfaction, and finally, may also positively impact actual learning outcomes as measured by student grades. It also showed that there is value placed on email communication by graduate learners. Finally, the study showed that both perceived and real value (in terms of grades) is found by learners in both quantitative subjects and behavioural subjects.

Keywords: faculty interaction; learning experience; learning outcomes; online learners

## Background

E-learning has created a paradigm shift in education, and in particular in the way knowledge is created. The opportunity to access broader and previously underserved markets has been particularly spectacular. Moreover, online education allows the formation of learning communities of geographically dispersed learners throughout the world. The phenomenal growth of online education in recent years has been a result of many things, but importantly it now provides a viable alternative to learners, who previously may not have had access to traditional education due to geographic location, financial position or other impediments. For example, learners, who have job commitments, itinerant lifestyles and family responsibilities find it difficult to attend campus-based education.

Online education has been subject to praise as well as criticism and one of the most common criticisms relates to the quality of educational outcomes from e-learning. Traditionalists and e-learning sceptics suggest face-to-face education is the only way to produce high quality educational outcomes as classroom interaction takes learning to a higher level. While in many circumstances this may be true, it is also possible that it is not the delivery mechanism but the learning design which influences the learning outcomes.

The notion that all e-learning is bad and all face-to-face education is good, is one that is often postured by those who have never tried or reviewed the e-learning environment. However, despite the debate, one issue seems prominent in the minds of those advocating the supremacy of face-to-face education – that of interaction in the classroom – both students with students and more particularly faculty with students. There is much evidence to support the value of faculty-student interaction in the online learning environment. For example, Beaudoin (2003) as well as Alessi and Trollip (2001) note that from a learner's perspective, the interface with an instructor in online discussions, is the most important interface in online programs. It is interesting to note that in the online environment, instructors need to be active to be viewed as interactive. Silent presence in the face-to-face class room may be acceptable, but in the online environment, this is not so. Understandably, activity by the faculty-facilitator provides some comfort for the e-learner, whereas similar comfort may be provided simply by the silent professorial presence in the face-to-face classroom.

## Theory

### Faculty interaction in online education

There is a general view that faculty need to be “seen” to be perceived as present in online learning communities (Picciano, 2002). This view is in part to prevent student isolation, according to Hongmei (2002), who further claims that a high level of faculty involvement will lead to a more successful course. Moreover, some view that instructor interaction with distance learners more generally is the critical predictor of learner satisfaction in distance education, and learner satisfaction declines when instructors are

perceived as “absent” (Fulford & Zhang, 1993). For example, while the use of private email for communicating with learners is considered acceptable practice by instructors in both face-to-face and e-learning programs, it is often not considered “sufficient communication” in the purely online environment. More particularly, perceived sufficiency of faculty interaction and involvement in the course delivery is more important than the simple number of private emails that students receive over the extent of a course (Woods, 2002). A “high touch” model (Patton, 2003; Allen, 2001), is interactive, and requires a higher investment in human resources than a “high tech” model of online education, including higher faculty recruitment, faculty training, certification and development (Allen, 2001). Laws, Howell and Lindsay (2003) while maintaining that there needs to be an appropriate balance between scalability and interactivity, advocate that the technology should be subservient to the instructional or learning design. Further, Cheney (2002) argue that human interaction in e-learning is critical predictor of success.

The opportunity of sharing information, discussions, and insights is regarded as one of the strongest advantages of online distance education (Alessi & Trollip, 2001). Online learning requires professors to learn a new tool and to spend significantly more time on organisation, preparation, and teaching and monitoring the class compared with traditional classes. Faculty members may spend more time planning the course, as all of its aspects need to be prepared before it is launched (McEwen, 2001). They also spend more time during the class on fewer students (Rosenbaum, 2001).

### **Evidence: The value of faculty interaction**

While the issue of faculty interaction has been well discussed, there has been limited research into the amount, quality and value of such interaction in the online learning environment (Rourke et al., 1999). This section reports some of this evidence and draws on evidence from both the online and distance education literature.

Student satisfaction and ultimately student retention is a key feature of any good educational programme. Deden (2005) reports a 7.76% improvement in student retention after one year through a number of measures including the quality of instructor’s online interaction with students. Laws, Howell and Lindsay (2003) report that many studies have found that completion rates in distance courses have historically been very low, with some estimating between 40 – 50 % at best.

Beaudoin’s (2003) empirical study found that both the quantity and quality of faculty-student interaction and student-student interaction improve faculty satisfaction with distance learning. A typical example is quoted by Bocci et al (2004) about an online MBA programme in the University System of Georgia called WebMBA, which has maintained a high retention rate with an average of 30 students per course. They attribute this retention rate to the team and cohort-based approach, as well as to extensive faculty interaction (during orientation, online, and even by phone) with the students. Research studies have shown that in discussion boards where the tutors are more involved, participants respond with more enthusiasm and regular participation (Harasim *et al.*, 1995).

There are different views about the “quantity” of faculty interaction in online classes. A study by Shank (2001) recommends that tutors should contribute at least 10% of discussion postings, while Berge (1995) suggests that tutor contribution should be at least 25%.

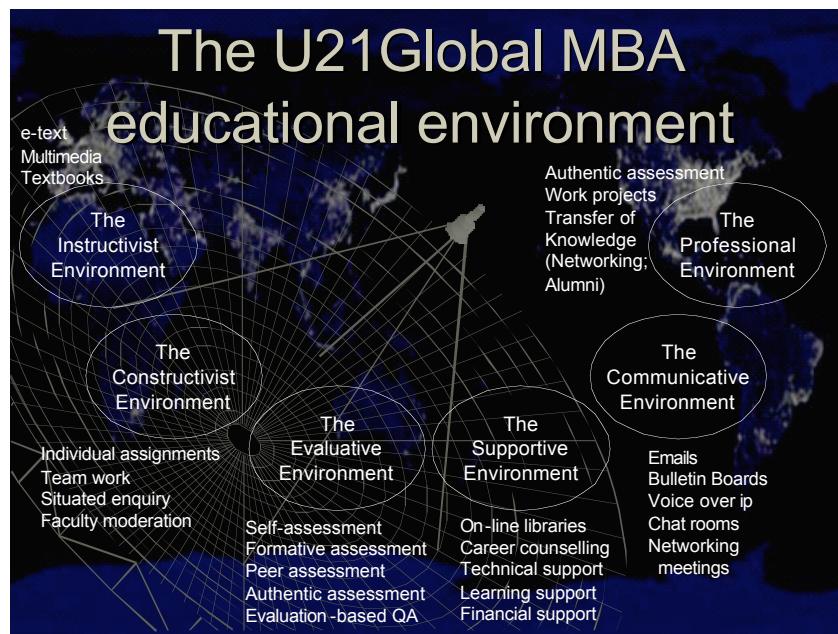
### **Method and data**

This study examines correlations between a number of measures of learner satisfaction and learner performance and measures of faculty interaction within the online learning environment of Universitas 21 Global (U21Global).

### **The learning environment under investigation**

The U21Global e-learning environment examined in this paper is pedagogically rich, and grounded in a constructivist model of learning which assesses learning outputs. U21Global, the e-learning graduate business school arm of the Universitas 21 consortium, admitted its first MBA students in August 2003. U21Global was set up to meet some of the challenges to tertiary education today, providing an alternative type of university, with broad access by millions of students globally. It provides an innovative, student-centred, constructivist pedagogy, to develop students in solving complex management problems and to develop the skill set required of competent managers in the global economy.

In just over four years since enrolling its first students, U21Global is developing its brand name, has attracted over 3000 students, has successfully achieved the Certification in technology Enhanced Learning (CEL) from the European Foundation for Management Development (EFMD), and has reached candidature stage towards accreditation by AACSB which has also accepted its pre-accreditation plan.



**Figure 1: The U21Global MBA educational environment**

The educational environment of U21Global, summarised in Figure 1, seems complex, but is designed to facilitate deep learning. Students have access to disciplinary information via textbooks and web content (developed via thorough quality assurance systems), and importantly for this paper the learning environment is faculty-mediated and student-centred with extensive examination of case studies through discussion boards and group work. Students have access to highly developed support systems including an extensive online e-library all hyperlinked to assist student research.

### **The role of professors in U21Global pedagogy**

In keeping with U21Global's constructivist philosophy, professors do not give lectures, and within the context of the U21Global learner-centric learning design, the professor adopts the role of facilitator, mentor or advisor rather than teacher, lecturer or instructor.

Apart from its core faculty, U21Global has a pool of more than 100 professors from renowned universities across the globe. All faculty members are highly qualified, have to successfully complete a three-week training course, and have their credentials checked by Universitas 21's quality assurance body, U21pedagogica. In the 3-week Faculty Training Programme new faculty are drilled on a number of key principles, including:

- *Maintaining a presence* – Letting the students know they are there by logging in regularly and posting to the Announcements page, and making interventions on the discussion boards.
- *Adding value* – Learners want the professor to facilitate their learning by taking them beyond the course content by providing anecdotes to illustrate key concepts and assistance in confronting complex or new ideas. These are invaluable to the student learning experience.
- *Encouraging peer interaction* – Coaxing students to learn from one another by inspiring their interaction on the discussion boards also serves to enhance their learning experience.

The faculty is required to perform monthly assessment of each student's discussion board postings using a rubric based upon parameters designed to determine student's competencies. Discussion board evaluations are additional to the constant qualitative feedback, guidance and direction provided by the faculty during the online asynchronous discussion board activities. The faculty also provides constructive comments and advice to the students while grading other assessment exercises like the Individual Assignment, Team Assignment, Final Project and Open Book Open Web (OBOW) Exam.

In 2006, various new initiatives were taken at U21Global to enhance the level of faculty interaction with the students. The concept of digital storytelling to introduce faculty was pioneered, where faculty presented multimedia presentations with background narration. These multimedia introductions, made available to students at the commencement of the class, which provide a more personal introduction of professors, have received encouraging response from students. Another innovation at U21Global during 2006 was the hosting of online synchronous "Webinars" conducted by its core and adjunct faculty, using

state-of-the-art software like *Elluminate* and *Interwise*. According to Arbaugh (2001), in the near future the immediacy construct may be broadened to include nonverbal behaviours for web-based courses as full motion/streaming video becomes more technologically feasible. Along with this prediction, in 2006, the faculty at U21Global began utilising video blogs as a medium for feedback to students and summarising student discussion board postings. Along with the assessment of faculty interaction itself, this study also helps us understand the impact of these initiatives in 2006 upon the learning experience of the students.

The questions underlying the research outlined in this paper are to test:

- whether faculty interaction results in higher student satisfaction.
- whether faculty interaction is correlated with student learning outcomes, as measured by student grades.
- whether faculty interaction leads to lower rates of student withdrawals from class.
- the recommendations of Shank (2001) and Berge (1995) that tutor's contribution should be at least 10% and 25% respectively.
- whether institutional learning about online education may have improved faculty interaction and subsequent learning outcomes and satisfaction over time.

To examine these questions, this study calculates the simple correlations between various student outcome and satisfaction variables, against a number of measures of faculty interaction, to firstly, evaluate whether there is any likely impact, and secondly, to assess if further study is warranted.

**Table 1: Details of the sample used in the study**

Subject	2005 Sections	2006 Sections	2007 Sections	Sample size
<b>Behavioural Subjects</b>				
Organisational Behaviour	3	17	3	23
Human Resources Management	1	3	0	4
Enterprise Knowledge Management	1	3	0	4
Supply Chain Management	0	3	0	3
IT Outsourcing & Vendor Management	0	2	0	2
Corporate Social Responsibility	0	0	1	1
Business Process Management & Outsourcing	0	1	2	3
Sample size for behavioural subjects				40
<b>Quantitative Subjects</b>				
Data Analysis for Managers	1	4	1	6
Financial Reporting and Statement Analysis	1	5	0	6
Finance	3	8	2	13
Managerial Economics	1	4	1	6
Global & Regional Economic Development	0	2	1	3
Operations Management	0	5	1	6
Financial Management for Decision Making	0	2	1	3
Sample size for quantitative subjects				43
<b>Hybrid Subjects</b>				
Marketing Management	2	7	3	12
Marketing Strategy	0	3	1	4
Management of services	0	2	0	2
Strategic Management	0	7	2	9
Project Management	4	5	0	9
E-Business	1	5	0	6
Capstone Management Project	0	1	1	2
Managing International Business	1	4	2	7
IT Systems for Business	1	4	1	6
IS Project Management	0	2	0	2
Developing New Enterprises	0	2	0	2
Information Systems Strategy	0	1	0	1
Sample size for hybrid subjects				62
<b>Total sample size</b>				<b>145</b>

## Data

This study uses data from a population of 145 sections of subjects from the MBA program at U21Global. The subjects and sections were conducted in three calendar years, 2005, 2006 and 2007. Consequently, in addition to reviewing the population over the period examined, we are able to observe the research questions across time (2005 to 2007), and across quantitative, behavioural and hybrid subjects. The population is described in Table 1.

The learner satisfaction and performance measures (items 13 to 16), and the measures of faculty interaction (items 4 to 12) used in the study are set out in the first column of Table 2. Table 2 also reports the summary statistics of all of the data examined. Of the 145 sections examined, 20 were from 2005, 103 from 2006 and 22 from 2007. In addition, sections examined covered 43 quantitative subjects, 40 behavioural subjects and 62 hybrid subjects.

**Table 2: Summary statistics**

		Total sample of classes	Sample from 2007	Sample from 2006	Sample from 2005	Quantitative subjects	Behavioural subjects	Hybrid subjects
1	Number of classes in sample	145	22	103	20	43	40	62
2	Average class size	27.71	27.86	27.24	29.95	28.81	26.35	27.51
3	Average no. of DB postings (student + faculty)	2181.19	2370.27	2179.03	1984.35	2028.93	2206.08	2278.48
4	Average no. of faculty logins	152.71	149.36	151.44	162.95	127.77	138.28	179.26
5	Average faculty DB postings	8.81	6.55	9.02	10.20	7.05	11.80	8.11
6	Average faculty DB replies posted	95.65	75.95	93.84	126.60	94.63	112.00	86.52
7	Average faculty DB postings + replies	104.46	82.50	102.86	136.80	101.67	123.80	94.64
8	Average faculty DB postings per student	3.77	2.96	3.78	4.57	3.53	4.70	3.44
9	Average faculty emails	100.68	78.18	98.83	134.95	88.09	127.03	92.21
10	Average faculty emails per student	3.63	2.81	3.63	4.51	3.06	4.82	3.35
11	Total interactions by faculty*	205.14	160.68	201.70	271.75	189.77	250.83	186.85
12	Average interactions per student	7.40	5.77	7.40	9.07	6.59	9.52	6.79
13	Average final grade	80.13	80.04	80.13	80.24	80.29	80.24	79.88
14	Overall satisfaction with professor (SEF score)	4.21	4.20	4.22	4.21	4.15	4.31	4.19
15	Overall satisfaction with subject (SES score)	4.28	4.25	4.28	4.31	4.24	4.32	4.29
16	No. of withdrawals	1.83	2.18	2.11	0.05	2.53	2.33	1.05

Note: \* emails, discussion board postings and discussion board replies

DB = Discussion Board      SEF = Student Evaluation of Faculty      SES = Student Evaluation of Subject

From the data in Table 2, we make a number of observations:

- *Average number of discussion board postings per class* – the difference from 2005 to 2007 is interesting, with increase each year from 2005 to 2006, and then again in 2007. While intuitively this may have been explained by the size of the class, the average class size in 2007 reduced. This indicates increased student and faculty interaction within class, and may be the result of the maturity of the program and institution with more experienced students studying in 2007. The average DB postings per class were about 10% less for quantitative subjects compared to both behavioural and hybrid subjects.
- *Total discussion board postings and replies by faculty* – the number of DB postings and replies by faculty dropped from 2005 to 2006, and then again in 2007. This may reflect the increasing online

experience of the professors as they move from reacting to each student DB posting, to more value driven postings and summaries which are more relevant to the whole class and generally add more value. Not surprisingly, there are more faculty DB postings and replies by faculty in the behavioural subjects, and the DB postings and replies per student are also far higher for behavioural subjects.

- *Average number of faculty emails* – Emails are a key part of the private consultation between faculty and students. While it could be postulated that in the quantitative subjects there would be more emails, as there may be the need for more individual student help, this is not the case, and there are more emails in total and per student in the behavioural subjects.
- *Total interactions by faculty* – Consistent with the findings for total discussion board activity, the summation of email and all discussion board activity by faculty appears to be significantly higher in behavioural subjects, compared to both quantitative and hybrid subjects.
- *Average SEF score and average SES score* – Student Evaluation of Faculty (SEF) and Student Evaluation of Subject (SES) scores are the average values of scores on various parameters given by all the students in a class to the professor and the subject respectively. At U21Global, it is mandatory for students to undertake these two surveys before they are able to view their final results in the Learning Management System (LMS) at the culmination of a course. There is very little difference in the scores from 2005 through to 2007, indicating a consistently high level of satisfaction of students with the subjects as well as the professors. Across the subject types, there is only a small variation, with the SEF scores for behavioural subjects about 10 basis points higher than SEF scores for quantitative and hybrid subjects. There is almost no variation in the average SES scores across the three subject types.

## Evaluation and results

Table 3 shows the results of all correlation calculations for the total sample of 145 sections, plus each of the groups of subjects: 43 quantitative sections, 40 behavioural sections, 62 hybrid sections, and year by year samples: 20 sample sections from 2005, 103 sample sections from 2006 and 22 from 2007. From the results shown in Table 3, we make the following observations:

### Satisfaction with faculty (SEF Scores)

- For all the 145 sections studied, there is a moderate positive correlation between faculty interaction through discussion board (postings and replies) (30%), emails (29%), and total interaction (35%). Similar results are found for quantitative and behavioural subjects, and in years 2006 and 2007.
- In the quantitative subjects, the correlations are stronger, showing 47% for discussion board interaction by faculty (postings and replies) and 50% for total faculty interaction. Further, the correlation with the proportion of faculty discussion board activity relative to the total class DB interaction is also high at 48%.
- Similar results are found for the behavioural subjects, although the correlations are marginally lower, and there is no indication that the proportion of faculty discussion board activity has any impact on satisfaction with faculty.
- While the correlations are in general positive in the hybrid subjects, the results do not indicate any value placed on faculty interaction as measured by the SEF scores.
- Faculty interaction in discussion board overall (postings and replies), emails and total interaction also showed moderate positive correlations with SEF scores in 2006 and 2007. The results for 2005, while positive are not strong.
- It is also noted that the correlation between the number of faculty logins and SEF score is quite high for quantitative subjects relative to behavioural and hybrid subjects (41%). This may be an indication that in quantitative subjects the students may gain comfort from faculty “presence” online. We note that this relationship was strong for 2007 too, increasing from 2006 and 2005.
- The average proportion of faculty discussion board activity relative to the total section discussion board activity is low at 5.48% for the total sample (5.54% for the quantitative subjects, 6.60% for the behavioural subjects, 4.75% for the hybrid subjects, 4.25% for 2007, 5.45% for 2006 and 6.98% for 2005). The correlation between this proportion and student satisfaction is also low at only 16% for the total sample). This would suggest that the ideal proportion of postings (at least 10% and 25% respectively) in online classes by faculty as proposed by two studies (Shank, 2001; and Berge, 1995) is not validated in this study.

### Satisfaction with the subject (SES scores)

- In general, there are moderate positive correlations between the various measures of faculty interaction and student satisfaction of subject. For example, for the total sample, the correlation between the total faculty interaction and subject satisfaction was 26%.

- Stronger results were obtained for the quantitative subjects (33%) and the behavioural subjects (39%), and in 2007 (33%).
- The results indicate that in 2006 and 2007, all types of faculty interaction were much more valued than in 2005.
- For quantitative subjects, we find a strong correlation between the proportion of faculty interaction through discussion boards relative to total class discussion board activity and the SES score (and also SEF score). This suggests that for these types of subjects, students value relatively higher faculty activity, in proportion to the class activity than in either the behavioural or hybrid subjects.

**Table 3: Correlations – all data**

	No. of Faculty Logins	Faculty DB Postings	Faculty DB Replies Posted	Faculty DB postings + replies	Faculty Emails	Faculty DB postings + replies + emails	Total No. of DB postings (student + faculty)	% of faculty DB postings + replies to total DB postings
<b>Total Data</b>								
AVERAGE per section	152.71	8.81	95.65	104.46	100.68	205.14	2181.19	5.48
Correlation to SEF	0.17	0.08	0.30	0.30	0.29	0.35	0.17	0.16
Correlation to SES	0.13	0.01	0.22	0.22	0.22	0.26	0.17	0.03
Correlation to final grade	-0.05	-0.10	0.14	0.13	-0.01	0.10	0.20	0.07
Correlation to No. of section withdrawals	-0.02	-0.01	0.04	0.03	0.13	0.08	0.17	-0.14
<b>Quantitative Subjects</b>								
AVERAGE per section	127.77	7.05	94.63	101.67	88.09	189.77	2028.93	5.54
Correlation to SEF	0.41	0.08	0.48	0.47	0.31	0.50	0.31	0.48
Correlation to SES	0.19	0.11	0.34	0.34	0.14	0.33	0.11	0.37
Correlation to final grade	0.03	-0.02	0.27	0.26	0.02	0.21	0.20	0.29
Correlation to No. of section withdrawals	0.41	-0.06	-0.07	-0.08	0.01	-0.05	0.20	-0.20
<b>Behavioural Subjects</b>								
AVERAGE per section	138.28	11.80	112.00	123.80	127.03	250.83	2206.08	6.60
Correlation to SEF	0.09	0.03	0.35	0.36	0.43	0.45	0.30	-0.23
Correlation to SES	0.07	-0.07	0.35	0.35	0.29	0.39	0.37	-0.27
Correlation to final grade	-0.17	-0.26	0.30	0.29	0.00	0.21	0.31	0.04
Correlation to No. of section withdrawals	0.05	0.07	0.13	0.14	0.31	0.23	0.12	-0.15
<b>Hybrid Subjects</b>								
AVERAGE per section	179.26	8.11	86.52	94.64	92.21	186.85	2278.48	4.75
Correlation to SEF	0.15	0.03	0.13	0.13	0.08	0.14	-0.02	0.10
Correlation to SES	0.15	-0.06	0.04	0.04	0.13	0.08	0.01	0.00
Correlation to final grade	0.01	-0.03	-0.08	-0.08	-0.08	-0.10	0.09	-0.08
Correlation to No. of section withdrawals	-0.06	-0.12	-0.05	-0.06	-0.05	-0.06	0.35	-0.25
<b>2007 Sections</b>								
AVERAGE per section	149.36	6.55	75.95	82.50	78.18	160.68	2370.27	4.25
Correlation to SEF	0.40	-0.35	0.30	0.26	0.25	0.39	0.37	-0.09
Correlation to SES	0.39	-0.38	0.12	0.08	0.37	0.33	0.41	-0.23
Correlation to final grade	-0.07	-0.63	0.11	0.04	0.43	0.34	0.07	-0.10
Correlation to No. of section withdrawals	-0.04	-0.12	0.21	0.20	0.31	0.38	0.00	0.01
<b>2006 Sections</b>								
AVERAGE per section	151.44	9.02	93.84	102.86	98.83	201.70	2179.03	5.45
Correlation to SEF	0.23	0.15	0.36	0.37	0.32	0.41	0.16	0.20
Correlation to SES	0.17	-0.03	0.25	0.24	0.20	0.27	0.18	0.01
Correlation to final grade	0.01	-0.06	0.11	0.10	-0.11	0.03	0.21	0.06
Correlation to No. of section withdrawals	0.01	0.01	0.08	0.08	0.22	0.15	0.19	-0.15
<b>2005 Sections</b>								
AVERAGE per section	162.95	10.20	126.60	136.80	134.95	271.75	1984.35	6.98
Correlation to SEF	-0.32	0.06	0.08	0.08	0.20	0.12	0.00	0.13
Correlation to SES	-0.09	0.40	0.16	0.18	0.10	0.19	-0.05	0.25
Correlation to final grade	-0.19	-0.01	0.26	0.25	0.09	0.24	0.27	0.21
Correlation to No. of section withdrawals	-0.14	0.33	0.14	0.16	-0.10	0.11	-0.03	0.23

Board, SEF = Student Evaluation of Faculty, SES = Student Evaluation of Subject,  
Indicates correlation of greater than or equal to 20%

### Final student grade

- There are low positive correlations between faculty discussion board activity and final student grade for the sample as a whole (13%).

- We gain stronger results for the quantitative (26%) and behavioural subjects (29%), although there is no strong result for the hybrid subjects – and moreover, it is curiously negative.
- For 2007 sections, we find that total faculty interaction has a strong impact on the final grade (34%) as do faculty emails (43%). Total interactions (24%) and faculty discussion board activity (25%) are moderately correlated in 2005 sections. However, in 2006, only total section discussion board activity by students and faculty has a moderate correlation with final grade (21%).

### **Student withdrawals from section**

- The results between faculty interaction and withdrawals across all samples are very mixed. For the sample as a whole, the correlations are close to zero. This is as one would expect, as student withdrawals are usually the result of illness, work issues, etc, and not related to faculty per se.
- The moderate positive correlations found in 2007 appear to be a statistical anomaly, and inconsistent with the low positive or negative results found in the other samples tested.
- Another curious result is the strong correlation between the number of faculty logins and the number of withdrawals in quantitative subjects (41%). It seems as if students, who are less interested in a subject or time constrained decide to withdraw from the course more often if they find the faculty quite active (logs in frequently). They might be feeling that it would be difficult to pass the subject with a faculty actively involved in keeping a vigil over activities of the students in the class. We intend to further explore on this issue in our future studies.

The findings of the study do have implications for the MBA programme at U21Global. Professors facilitating the quantitative and behavioural subjects should be encouraged to increase the “quantity” of their interactions with students for better SEF, SES and final student grades. The faculty in quantitative subjects should be encouraged to login into the LMS more frequently. Though, the faculty should not be provided with any “ideal” proportion of postings.

### **Conclusion**

The research findings are based on the analysis of 145 sections, covering quantitative, behavioural and hybrid subjects offered over 2005, 2006 and 2007. The data represents 4,018 student places in MBA subjects.

The research conducted in this study has found a number of interesting results associated with faculty interaction in online graduate management education. In particular, the study has found that of the sections examined, total faculty interaction is moderately positively correlated to student satisfaction of their professor (35%) and satisfaction with the subject (26%). This appears to be driven by the strong correlation in the quantitative subjects (50% and 33%) and in the behavioural subjects (45% and 39%), compared to the hybrid subjects (14% and 8%), suggesting that faculty interaction in hybrid subjects may not be valued as highly as in the purely quantitative and behavioural subjects. Hence, the results support the notion that student perception and satisfaction is influenced by faculty interaction.

Faculty interaction is also found to influence student performance as measured by student final grade. This is particularly apparent for the quantitative and behavioural subjects, and in the sections run in 2007. This is further evidence of the value, both perceived by way of student satisfaction, and real by way of student grades, that faculty interaction in the online classroom is valued in both quantitative and behavioural subjects.

The results for student withdrawals in the first few weeks of a section are very mixed, although they are very close to zero for the sample as a whole, as would be expected.

The average faculty interaction per section reduced from 2005 to 2006 and then again to 2007, and despite this, the average SES and SEF scores were not significantly different over the three years. The significance of the drop in faculty interaction to learner performance is a question worthy of further investigation.

Finally, the study did not find any support for the propositions of either Shank (2001) or Berge (1995) that faculty interaction needs to be at least 10% and 25%, respectively.

However, the study found that emails do add value to learner performance and satisfaction – although whether this is independent of other interaction through discussion board activity, is still to be determined, and is worthy of further examination.

While it is sometimes suggested that there may be different value placed on the different forms of interaction between quantitative and behavioural subjects, no evidence was found by this study. There

were some differences at the margin, but not overall. Again, this is worthy of further investigation, and especially when the results for the hybrid subjects were so different from those of the other two subject types.

One further issue that may influence outcomes is the technology used by the online program. For example, Hashemzadeh and Wade (2004) suggest that student experience can also be impacted by technology issues such as LMS downtimes. At U21Global, downtimes are relatively infrequent – with uptimes of over 99.5%. As such, student experience at U21Global is likely to reflect in the positive correlations found in the results of this analysis.

In conclusion, the results of the study support the notion that faculty interaction does add value to the learner satisfaction with the learning experience and also adds value to the actual learning outcomes, particularly in quantitative and behavioural subjects.

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