

Effective Communication between Students and Lecturers: Improving Student-Lead Communication in Educational Settings

Hannah Lena Merdian^a & John Kyle Warrior

University of Lincoln, UK

This study investigated students' communication preferences in educational settings, resulting in an empirical model of effective communication between students and lecturers. Students from a [psychology department at a](#) UK university were asked about their preferred communication tool for academic purposes, including social networking, emails, university-internal virtual learning environments, and face-to-face communication. The data was analysed using methods of exploratory data analysis and cluster analysis. Students clearly expressed a preference for social networking sites when communicating with peers due to their frequent and widespread use, fast response rate, and ease of access, but preferred face-to-face meetings when sufficient time was available. When communicating with lecturers, students had a preference to use email. The findings also showed that students preferred to attend lecturers over reading lecture slides online. Based on these results, an empirical model of students' communication preferences in educational settings was developed aimed to aid in the effective management of student-lead communication. The study concludes with a critical evaluation of ways students and lecturers can improve communication between each other and how this can positively contribute to students' university experience.

Keywords: communication, social networking, face to face learning, Virtual Learning
Environments

Corresponding Author: Hannah Merdian: hmerdian@lincoln.ac.uk, postal address:
University of Lincoln, School of Psychology, Brayford Pool, Lincoln LN6 7TS

Effective Communication between Students and Lecturers: Improving Student-Lead Communication in Educational Settings

Effective communication is the key to human interaction. The systematic study of human communication established itself as a topical area in the 1950s, initially focusing on the impact of communication on decision making (Littlejohn, 1999). However, since the last decade, traditional communication theories are challenged by the up-take of mass media and information technology, which has substantially changed the ways people communicate with each other (Chen, Pedersen, & Murphy, 2011). For example, Social Presence Theory relates to the experience of one another that impacts and defines social communication (such as through facial expression or posture; Rice, 1993), but is dependent on the context of both the interrelationship and the communication (Walther, 1992), as well as the individual communicators (Gunawardena & Zittle, 1997). However, with the introduction of technology-based communication, all aspects of social presence have been moderated (e.g., use of emoticons instead of facial expressions), requiring an operational reconceptualization of Social Presence Theory (Lowenthal, 2010; Tu, 2000).

Computer-Mediated Communication (CMC) is defined as “communications, mediated by interconnected computers, between individuals or groups separated in space and/or time.” (Luppicini, 2007, p. 142) and includes email exchange, instant messaging, live video chatting, and the usage of social networking sites, such as *bebo* or *Facebook*. According to Merdian and Reid (2013), “social networking sites invite internet users to create an online profile (containing various amounts of personal information, photos, etc.) and to engage in social exchange with other members of the social networking site. Users can become ‘friends’ with other users, send and receive messages (public or private), comment publicly on another person’s profile site, and create specific subgroups with each other” (p. 29). While research has shown an interaction between online and offline communication (e.g., Boyd & Ellison, 2009; Ellison, Steinfield, & Lampe, 2007), CMC remains on the rise; in 2012, 84.1% of British people had access to the internet, with 74% of them reporting to have an active *Facebook* account (“Usage Patterns,” 2013). Consequently, the use of the internet

and CMC has also entered traditional learning environments in recent years, ranging from university degrees offered through online learning to the inclusion of CMC and the internet within traditional university environments (Luppicini, 2007). This has sparked developments in higher education, such as *The Virtual Pedagogy Initiative* (Senior, Butler, Wood, & Reddy, 2008) who introduced the term “digital natives” (p. 18) to refer to contemporary student cohorts, as a learner group with different communicative needs and skills than traditional learners.

One of the most popular forms of CMC is email exchange, with 7.2% of all internet usage in the UK being related to E-Mail (“Social Networks”, 2013). For the past two decades, email has been the online communication method of choice for both formal and informal conversations in professional environments such as the university (Judd, 2010). Tolmie and Boyle (2000) stated that the introduction of email into learning environments increased effective communication between students and lectures, through the provision of a communication platform outside of the time-related and geographical constraints of the university and through provision of a potentially less threatening communication tool for students who find it difficult to communicate in group settings. This is also supported in Light, Colbourn and Light’s (1997) study on computer mediated support in university tutorials which showed that whilst male students were more dominant in a face-to-face environment, this gender inequality disappeared in the online exchange. In addition, the email exchange provides a written record of what has been said, making email an ideal medium for positive conflict solving (Tolmie & Boyle, 2000). However, increasingly research is emerging on the negative effects of email interruptions on work place productivity (e.g., Jackson, Dawson, & Wilson, 2001), however, this has not yet been explored for academic settings.

However, Judd (2010) found that the use of email in university settings declined by 30% between 2005 and 2009, paralleled by a rapid increase in use of Social Networking Sites (SNS) from 3% to 38%. There has been some research on the benefits of SNS usage in educational settings. Pilgrim and Bledsoe (2011) explored the advantages of Facebook groups between educators and students, which allow members to add posts with information

and questions for all members to see and to respond and interact with each other regarding the posting. Using a similar format, Cain and PolICASTRI (2011) invited guest experts who were not affiliated with the school onto the Facebook groups, which students perceived as a great opportunity to learn from a broad range of educators. They also found that the informal structure of Facebook made the students feel more comfortable communicating with the experts. Finally, Selwyn (2009) researched the benefits of using Facebook for academic purposes in student to student communication and reported on a number of university-related themes on their wall posts, for example discussing content of lectures and assignments, as well as passing relevant course information to each other.

Besides communicating on groups and wall posts, SNS also allows for social exchange via instant messaging or online chatting. Nicholson (2002) and Farmer (2005) reported that students frequently used instant messaging for communicating about educational topics, and that it was perceived as a positive tool. Instant messaging is already used as a supporting communication pathway between lecturers and students in distance learning courses but has yet to be integrated into regular universities where it still appears to be viewed as a socialising rather than an educational tool (Madge, Meek, Wellens, & Hooley, 2009).

Whilst the use of SNS in universities has been limited mostly to student to student communication, universities have begun to utilise online communication and learning through Virtual Learning Environments (VLE), such as *Blackboard* or *Moodle* (Dillenbourg, Schneider, & Synteta, 2002). VLE allow students and lecturers to communicate and discuss educational topics on a closed, institution-based system that can be monitored; they enable the use of forums and emails, and to post learning material on bulletin boards (Hollyhead, Edwards, & Holt, 2012). Hollyhead et al. found that both students and educators appreciated the convenience of VLE due to the unrestrained access to learning content and the ability to contact or ask questions to their peer group and educators simultaneously in one closed forum. However, research by Sweeney, O'Donoghue and Whitehead (2004) reported a lack of student support for VLE, relating to comparatively slow responses to queries, which gives

students a sense of feeling alone and not considering themselves as part of the group.

Another disadvantage of VLE was reported by Hollyhead et al. (2012), who identified the lack of instant messaging as causal to the lack of social presence online. However, despite the underutilisation of VLE, Hollyhead et al. viewed them as a good option for students to communicate with educators and educators with students in a more formal setting than on social networking sites. Increasingly, multi-user virtual environments such as *Second Life* are also used ~~for worlds are used for~~ as educational platforms (Warburton, 2009), especially in medical and other health-related subjects (Boulos, Hetherington, & Wheeler, 2007).

In summary, the research to date shows that computer-based communication has changed the ways how educators and students communicate for academic purposes, but shows some shortcomings in the implementation of these tools. In their research on distant education courses, Swan (2001) and Richardson and Swan (2003) identified the online interaction with lecturers and peers as a key component for students' satisfaction with the academic programme. This finding has also been confirmed for traditional university-settings (e.g., Hostetter & Busch, 2006; Lowenthal, 2009, 2010). However, the research in this area is still in its infancy in terms of how CMC is integrated in a traditional university setting, how this relates to and expands upon traditional communication theories, how the different communication forms are implemented and perceived by their users, and how they compare in their effectiveness. The current study was thus aimed to investigate four modes of communication available to undergraduate psychology students at an English university, namely, face-to-face, email, VLE (namely *e.*, *Blackboard*), and the most commonly used SNS *Facebook*, exploring which of these communication methods students prefer, which they find most helpful, why they prefer or dislike a particular method, and what aspects of the communication they find helpful or unhelpful. A broader aim of this research was to help universities to connect and communicate effectively with their students, based on the student-lead perception of academic communication.

Method

Participants

Participants were either current undergraduate psychology students or students who had graduated from the university in 2011 or 2012 with an undergraduate degree in psychology. Overall, 98 of 123 participants completed the study (80% completion rate); of those, only 18 participants (18%) were male, with an age range from 19 to 35 years ($M = 21.22$; $SD = 3.64$), with the 80 female participants being aged between 18 and 44 years ($M = 20.88$; $SD = 4.01$).

Instrument and Procedure

An online questionnaire was designed on *SurveyMonkey*, ~~using an adapted~~based on version of Tu's (2002) measure of students' perception of social presence and their ease of use. Items were developed specifically for this study, concerning four modes of educational communication modes: (1) Face-to-face, for example, "I prefer meeting with lecturers face to face rather than using email."; (2) email, for example, "Using university email is an excellent way of interacting with lecturers."; (3) VLE (Blackboard), for example, "Reading slides on Blackboard is just as beneficial as attending lectures."; and (4) SNS (Facebook), for example, "I would prefer to use discussion boards over Facebook if they were used by more people." Students were asked to rate their agreement on a 5-point Likert scale (strongly agree – strongly disagree) ~~to a range of statements concerning four modes of educational communication modes: (1) Face to face, for example, "I prefer meeting with lecturers face to face rather than using email."; (2) email, for example, "Using university email is an excellent way of interacting with lecturers."; (3) VLE (Blackboard), for example, "Reading slides on Blackboard is just as beneficial as attending lectures."; and (4) SNS (Facebook), for example, "I would prefer to use discussion boards over Facebook if they were used by more people."~~ Students were recruited via Facebook, through the university email system, and face-to-face by giving them a link to the online questionnaire. The study was designed and conducted according to the ethical guidelines by the British Psychological Society and received ethical approval from the university.

Data Analysis

As part of the exploratory data analysis, descriptive analysis and item content analysis was conducted to identify patterns in the participants' responses when judging preferential communication mode. The focus of the second part of the data analysis was dimension reduction, in order to identify groups of items as a potential explanatory model for students' declared communication preferences. The most common methods of variable reduction in exploratory research are Principal Component Analysis (PCA) and Cluster Analysis (CA). PCA is used to simplify a variable set to its latent principal components (Johnson & Wichern, 2002). Cluster Analysis (CA) is a way of combining variables into groups according to their similarity, which is based on a distance matrix between items (Afifi, Clark, & May, 2004). Both dimension reduction techniques can reveal relationships that were not previously assumed (Johnson & Wichern, 2002), and have been used for variable selection (Jolliffe, 2002; Silverstein, 1985). However, PCA introduces a new structure level beyond the data while CA remains on the variable level, thus inherently is a classification rather than dimension reduction method (Bortz, 2005). Thus, CA was the preferred method of choice. This was further supported given the assumption that pre-grouping of items was expected due to the split into different communication modes and the mixed intercorrelation matrix resulting from this.

Results

Participants' responses for each mode of communication can be seen in Table 1 to 4.

[Insert Table 1-4 about here]

Overall, it appeared that most students expressed a preference for communication via social networking (67.3%), followed by face-to-face (60.2%), emails (48%), and discussion boards (26.5%). There was a gender difference observed in the preferred communication method, however, this did not reach statistical significance (Fisher's exact test, *n.s.*). Females expressed the strongest preference for social networking (71.3% vs. 50% of males) while male students reported their strongest preference for face-to face meetings (72.2% vs. 57.5% of females). Preference for email communication was varied (55.6% of males vs.

46.2% of females) and VLEs remained the least preferred option amongst both genders (33.3% of males vs. 25.7% of females).

As part of the exploratory data analysis, item order and item content of participants' responses was analysed in the context of the preferred communication method.

Face-to-face communication. In analysing the responses provided for face-to-face communication, it appeared that lecture attendance was widely preferred over self-inducted learning. In terms of other forms of information dissemination, emails and face-to-face contact were both used; however, students' preferred face-to-face contact for situations with a stronger intensity, for example, for in-depth preparation or where peer-support was needed. Especially male students expressed a strong preference for face-to-face contact with lecturers and peers.

Email exchange. Content analysis of the questions revealed that the moderate popularity of email exchanges was based on two factors: the value of the information provided, and personal inhibitions to approach a lecturer via email. It was generally found that email exchange was useful for specific enquiries as well as when time was available to await a response. However, students would always reported that they checked other resources before emailing their lecturers (e.g., only 31.6% reported lecturers as the first point of contact before posting their query online), and reported some embarrassment in approaching the lecturers (48% of students did not disagree that they experience embarrassment when emailing lecturers topic-related questions). Overall, while the pattern of preference was similar for both genders, males were more likely to employ email communication with lecturers.

Virtual Learning Environments. VLEs, for example *Blackboard*, were reported as the least preferred communication mode, and content analysis revealed some context to its low popularity. Students reported a clear preference for lecture attendance rather than online learning. In terms of exchange between peers and lecturers, students strongly agreed that VLEs were underused and thus often neglected towards other forms of social media due to the slow and unreliable response rate. However, participants, especially the male students,

~~would reported they would~~ prefer VLEs over social network usage for academic purposes if they ~~would be used were used~~ more widely.

Social Networking. Social networking, for example *Facebook*, was the most preferred option for academic exchange beyond lecture attendance due to its fast response rate, lack of psychological barriers to ask questions, and the perceived quality of responses. Females expressed a ~~much~~-stronger preference for exchange via social networking than did male students. Interestingly, both genders were noncommittal towards lecturer membership on social networking groups.

Summary. Overall, it appears that there are three main themes emerging in the data that defines how students decide their preferred communication choice: (1) The type and depth of content of the exchange (e.g., lecture, specific request, study preparation; high intensity vs. low intensity), (2) addressee of the exchange (lecturer vs. peers), and (3) the time available until a response is needed (short vs. long). Face-to-face meetings are preferred for lectures and other types of information-intense exchanges. Lecturers are preferred to be emailed for direct requests or seen face-to-face, while peers are preferred to be seen for study preparation but are preferably contacted via social media. Social media are usually the preferred mode of communication if there is only a short time available until a response is needed. The ~~study identified some re are some~~ psychological barriers towards communicating with lecturers, and students ~~seem more likely to usually~~ check other modes of information before they approach a lecturer directly.

A hierarchical CA using Squared Euclidean Distances between variables (recommended distance measure for variable selection; Izenman, 2008) resulted in five distinct clusters of items. As CA is a procedure sensitive to outliers (Afifi et al., 2004), hierarchical clustering was repeated with a fixed cluster number (100% identical classification of variables). However, it should be noted that the agglomeration matrix revealed a varied merging process between the variables, suggesting a potential lack of stability in the cluster solution. Replication of the cluster structure using different distance methods (Pearson's correlation, Cosine) and using only three quarters of cases validated the

current cluster solution with the exception of items belonging to Cluster 2 and 3. This communicates a strong interrelationship between the two clusters, which explains the lack of stability identified before. The final cluster structure is displayed in Table 5; again, caution is warranted when interpreting cluster 2 and 3.

[Insert Table 5 about here]

Cluster 1 contains six items clearly relating to the positive nature of social networking, and was thus labelled *Preference for Social Networking*. Facebook groups are identified as a fast, reliable, and well-used mode of communication. This cluster communicates that there is a group of students who have a clear preference for using social networking for academic purposes.

Cluster 2 and 3 are very similar and express a clear preference for directed and contained ways of academic communication. Face-to-Face meetings are preferred for more intense information exchange, such as study preparation with course mates or lecture attendance. Email is used for more direct requests. These two clusters show that students require a certain level of exchange with their lecturers and peers, and are ready to use a range of communication modes for that purpose. A desire for a stronger use of VLEs is expressed.

Cluster 4 contains two items, identifying those variables (and thus participants) who prefer online learning towards lecture attendance, and was thus labelled *Preference for Online Learning*. The fact that they are singled out from the previous cluster confirms that students who prefer online learning are very different in their communication needs than students who prefer lecture attendance.

Cluster 5 is not a genuine cluster but only consists of one item, addressing the need for lecturers to monitor Facebook groups. The fact that this item remained separate from the other clusters, especially from Cluster 1, shows that this view is not shared by regular social networking users.

The cluster solution confirmed the value of the three main themes identified above, that the preferred communication method is dependent on the type and content of the

exchange, the addressee, and the time frame available. It also showed clearly that social networking is a preferred method of communication but is perceived differently by the students from other modes of communication. Thus, it has some merit as a peer-only exchange forum for academic purposes. The data point clearly to the potential value of VLEs as a cross-over communication tool between peer-only social exchange and direct lecturer-student communication.

The information from the exploratory data analysis and the cluster analysis was then summarised into the empirical model of students' communication preferences in educational settings (see Figure 1).

[Insert Figure 1 about here]

Discussion

Students at a [psychology department at a UK University](#) were tested on their preferences of four different methods of communication, face to face, email, Virtual Learning Environments and Social Networking Sites. The finding showed that the largest indicator of preference in communication mode was reliant on three aspects, the type and depth of the information exchange, the addressee, and the amount of time available to the students. A Cluster Analysis confirmed the significant role of these aspects in students' preferred communication choice. It further showed that there is a subgroup of students who prefer online learning in comparison to attending lectures, and that these students have very different communication needs. In addition, it ~~was seen~~[appeared](#) that social networking is a preferred communication mode for peer-exchange only. Both parts of the data analysis ~~clearly~~ point to the potential value of VLEs as a contained academic discussion tool.

These findings are in agreement with Swan (2001) and Richardson and Swan (2003) who reported that, despite the increase of virtual learning opportunities, face-to-face meetings remain to play a major role in student satisfaction. Interestingly, the current study confirmed the gender bias observed by Light et al. (1997) that male students seem to prefer a face-to-face learning environment in comparison to female students (72.2% vs. 57.5%). The findings further suggest that in terms of in-depth discussion and preparation students

prefer the presence of their peers which is used as a motivator that cannot necessarily be obtained through online media. However, it ~~is also~~ became evident that online social presence has a key role in students' communication (Hostetter & Busch, 2006; Lowenthal, 2009, 2010).

The current study also showed that email is a frequently used choice of communication between students and lectures, especially. ~~The current study showed that email is preferred~~ for direct information exchange with low intensity. The high popularity of email exchange may also be explained by Tolmie and Boyle's (2000) suggestion that email may be especially preferable for shy or nervous students who may be inhibited in face-to-face environments. However, there appears to be some hesitation before doing so, with about 70% of participants ~~agreeing or strongly agreeing~~ refusing to respond that "When emailing lecturers I worry I will be wasting their time" or that "When emailing lecturers I worry about annoying them". Many students also reported that they would check other sources of support first before emailing their lecturers.

An interesting finding of the current study is that virtual learning environments, such as Blackboard, are perceived as appealing by the students but are widely perceived as being underused. This outcome is in line with previous studies that reported a lack of social presence on academic VLEs (e.g., Hollyhead, Edwards, & Holt, 2012; Sweeney, O'Donoghue, & Whitehead, 2004). The responses of the current survey show that VLEs could be utilised more to help students and indicate, similar to the findings by Sweeney et al. (2004), that students would prefer interacting on a discussion board that is monitored by lecturers. Browne, Jenkins and Walker (2006) found that VLEs such as Blackboard were deployed in 98% of universities in UK; however, all reported difficulties in their uptake due to their infrequent usage. This may explain the considerably high popularity of social networking sites that could be redirected towards a more contained, purely academic online forum. In addition, using discussion boards s may also add in reducing some of the lecturers' email load, especially when information requested by a number of students is shared, and may allow students with inhibitions towards emailing their lecturers to request and receive

the information in a more anonymous context. However, it appears that, for this particular department, currently Blackboard is not frequented enough to trust in reliable and fast information transmission.

Overall, social networking was considered the most popular communication tool amongst students. This finding supports Cain and Policastri (2011) and Pilgrim and Bledsoe (2011) who pointed to the increasing influence of Facebook for communication in education. Participants in the current study referred to the ease of access, along with the fast response rate which makes Facebook a convenient forum to propose questions and queries, especially when under time pressure. Thus, if the university could find a way to utilise Blackboard in these ways, students are likely to find it a helpful communication tool, amongst them as well as concerning student-lecturer exchange.

Limitations

While the current study aims to explore students' preference in any educational settings, the findings are limited to its sample of psychology students from the University of Lincoln none specific UK university. The reported findings are undoubtedly influenced by the current usage of communication mode at the University, specifically within the School of Psychology, and students' communication needs might also vary depending on the academic programme students undertake. In addition, the sample accessed was gender-imbalanced (82% females) which is a representative sample for a psychological undergraduate degree but further hinders generalizability across other study programmes.

In addition, as the survey was conducted online, it meant that students who use the internet more were more likely to participate in this project. The study was advertised through the university email system as well as posted on Facebook, which may explain the high popularity of Facebook in the current study.

Finally, students were asked to rank pre-set statements, which did not allow for more detailed feedback by the participants. It would benefit the area of study if future research was to conduct a qualitative study with a wider range of students from different universities across the country to increase its reliability and validity. Two areas from this study that

should be researched further are (1) why students worry about “annoying lecturers” and “wasting their time”, which could help universities in increasing effective communication between lecturers and students, and (2) explore the popularity of social networking in more detail.

Conclusion

Overall, whilst computer mediated communication and social networks in particular are becoming a major part of student-lead communication, this study has shown that students still have a need for the face to face aspect of academic learning and teaching; ~~however, also require the integration of internet-based communication~~. It should be noted, though, that this study focuses purely on student preferences. To date, there has been little research into the preferred communication method of lecturers and academics, an area of pedagogical research that would ~~greatly~~ add to the current study.

Based on the outcomes of this research, a number of suggestions follow on how lecturers and students could improve their communication, which may result in higher student satisfaction and potentially improved academic efforts.

Suggestions for lecturers and the university as a wider organisation:

- Promote the use of virtual discussion boards for both academic exchange and dissemination of information.
- Encourage students to contact lecturers directly if they have specific questions or queries.
- Communicate expected time frames for email response or face-to-face appointments, and clearly communicate other sources of information to avoid repeat emails (e.g., where lecture notes are found)
- Inclusion of instant messaging on discussion boards could increase its usage and popularity amongst students. Advise students of realistic response time frames and how posts are going to be monitored.
- Time availability is a major part in the communication preference, and thus time management could be a useful skillset to be taught to students.

Suggestions for students:

- Arrange to meet up in study groups to motivate each other to do more work and be more efficient.
- Promote discussion boards amongst friends and peers on your course. The more people that start using the facility the more helpful it will be and response time will get faster.
- Be patient. Understand that lecturers cannot always reply same day therefore accommodate yourself enough time for a response.
- Set out specific hours each day for doing university work to avoid falling behind and therefore not having time to email or meet lecturers.

References

- Afifi, A., Clark, V. A., & May, S. (2004). *Computer-aided multivariate analysis* (4th ed.). Boca Raton, FL: Chapman & Hall/CRC.
- Bortz, J. (2005). *Statistik fuer Human- und Sozialwissenschaftler* [Statistics for social scientists] (6th ed.). Heidelberg, Germany: Springer Medizin Verlag.
- [Boulos, M. N. K., Hetherington, L., & Wheeler, S. \(2007\), Second Life: An overview of the potential of 3-D virtual worlds in medical and health education. *Health Information & Libraries Journal*, 24, 233–245. doi: 10.1111/j.1471-1842.2007.00733.x](#)
- Boyd, D. N., & Ellison, N. B. (2008). Social network sites: Definition, history, and scholarship. *Journal of Computer-Mediated Communication*, 13, 210-130. doi: 10.1111/j.1083-6101.2007.00393.x
- Browne, T., Jenkins, M., & Walker, R. (2006). A longitudinal perspective regarding the use of VLEs by higher education institutions in the United Kingdom. *Interactive Learning Environments*, 14(2), 177-192.
- Cain, J., & Policastri, A. (2011). Using Facebook as an informal learning environment. *American Journal of Pharmaceutical Education*, 75(10), 207-216
- Chen, C. Y., Pedersen, S., & Murphy, K. L. (2011). Learners' perceived information overload in online learning via computer-mediated communication. *Research in Learning Technology*, 19(2), 102-116.
- Dillenbourg, P., Schneider, D., & Synteta, P. (2002). Virtual learning environments. In *Proceedings of the 3rd Hellenic Conference 'Information & Communication Technologies in Education'* (pp. 3-18). Retrieved from <http://hal.archives-ouvertes.fr/docs/00/19/07/01/PDF/Dillernbourg-Pierre-2002a.pdf>
- Ellison, N. B., Steinfield, C., & Lampe, C. (2007). The benefits of Facebook "friends:" Social capital and college students' use of online social network sites. *Journal of Computer-Mediated Communication*, 12(4), 1143-1168.
- Farmer, R. (2005). Instant Messaging: IM Online! RU?. *Educause Review*, 40(6), 49-50.

Gunawardena, C. N. & Zittle, F. J. (1997). Social presence as a predictor of satisfaction within a computer-mediated conferencing environment. *The American Journal of Distance Education*, 11(3), 8-26.

Hollyhead, A., Edwards, D. J., & Holt, G. D. (2012). The use of virtual learning environment (VLE) and social network site (SNS) hosted forums in higher education A preliminary examination. *Industry and Higher Education*, 26(5), 369-379.

Hostetter, C., & Busch, M. (2006). Measuring up Online: The Relationship between Social Presence and Student Learning Satisfaction. *Journal of Scholarship of Teaching and Learning*, 6(2), 1-12.

Izenman, A. J. (2008). *Modern multivariate statistical techniques: Regression, classification, and manifold learning*. New York, NY: Springer.

Jackson, T., Dawson, R., & Wilson, D. (2001). The cost of email interruption. *Journal of Systems and Information Technology*, 5(1), 81-9. doi: 10.1108/13287260180000760

Johnson, R. A., & Wichern, D. W. (2002). *Applied multivariate statistical analysis* (Vol. 5, No. 8). Upper Saddle River, NJ: Prentice Hall.

Jolliffe, I. T. (2002). *Principal Component Analysis* (2nd ed.). New York, NY: Springer.

Judd, T. (2010). Facebook versus email. *British Journal of Educational Technology*, 41(5), 101-103.

Light, P., Colbourn, C., & Light, V. (1997). Computer mediated tutorial support for conventional university courses. *Journal of Computer Assisted Learning*, 13(4), 228-235.

Littlejohn, S. (1999). *Theories of human communication*. Belmont, CA: Wadsworth

Lowenthal, P. R. (2009). Social presence. *Encyclopedia of Distance and Online Learning*, 2.

Retrieved from

<http://www.patricklowenthal.com/publications/socialpresenceEDOLpre-print.pdf>

Lowenthal, P. R. (2010). The evolution and influence of social presence theory on online learning. In T. T. Kidd (Ed.), *Online Education and Adult Learning: New Frontiers for Teaching Practices* (pp.124–134). Hershey, PA: IGI Global.

Luppicini, R. (2007). Review of computer mediated communication research for education. *Instructional Science*, 35(2), 141-185.

Madge, C., Meek, J., Wellens, J., & Hooley, T. (2009). Facebook, social integration and informal learning at university: 'It is more for socialising and talking to friends about work than for actually doing work'. *Learning, Media and Technology*, 34(2), 141-155.

Merdian, H. L., & Reid, S. L. (2013). E-professionalism: usage of social network sites by psychological professionals in training. *Psychology Aotearoa*, 5(1). 28-33.

Nicholson, S. (2002). Socialization in the "virtual hallway": instant messaging in the asynchronous web-based distance education classroom. *The Internet and Higher Education*, 5(4), 363-372.

Pilgrim, J., & Bledsoe, C. (2011). Learning through facebook: A potential tool for educators. *Delta Kappa Gamma Bulletin*, 78(1), 38-42.

Rice, R. E. (1993). Media appropriateness: Using social presence theory to compare traditional and new organization media. *Human Communication Research*, 19(4), 451-484.

Richardson, J. C., & Swan, K. (2003). Examining social presence in online courses in relation to students' perceived learning and satisfaction. *Journal of Asynchronous Learning Networks*, 7(1), 68-88.

Selwyn, N. (2009). Faceworking: Exploring students' education-related use of Facebook. *Learning, Media and Technology*, 34(2), 157-174.

Senior, C., Butler, M., Wood, J., & Reddy, P. (2008). The Virtual Pedagogy Initiative. *Aston Business School: Good Practice Guide 2007-2008*. Retrieved from http://eprints.aston.ac.uk/2428/1/Virtual_pedagogy_initiative.pdf

Silverstein, A. B. (1985). Cluster analysis of the Wechsler Adult Intelligence Scale-Revised. *Journal of Clinical Psychology*, 41(1), 98-100. doi: 10.1002/1097-4679

Social Networks and UGC (2013). Retrieved from <http://www.newmediatrendwatch.com/markets-by-country/18-uk/152-social-networks-and-ugc>

Swan, K. (2001). Virtual interaction: Design factors affecting student satisfaction and perceived learning in asynchronous online courses. *Distance Education*, 22(2), 306-331.

Sweeney, J., O'donoghue, T., & Whitehead, C. (2004). Traditional face-to-face and web-based tutorials: a study of university students' perspectives on the roles of tutorial participants. *Teaching in Higher Education*, 9(3), 311-323.

Tolmie, A., & Boyle, J. (2000). Factors influencing the success of computer mediated communication (CMC) environments in university teaching: a review and case study. *Computers & Education*, 34(2), 119-140.

[Tu, C. -H. \(2000\). On-line learning migration: From social learning theory to social presence theory in a CMC environment. *Journal of Network and Computer Applications*, 23, 27-37. doi:10.1006/jnca.1999.0099](#)

[Tu, C. -H. \(2002\). The measurement of social presence in an online learning environment. *International Journal on E-Learning*, 1\(2\), 34-45. Retrieved from <http://www.editlib.org/p/10820>.](#)

Usage Patterns and Demographic. (2013). Retrieved from <http://www.newmediatrendwatch.com/markets-by-country/18-uk/148-usage-patterns-and-demographics>

[Walther, J. B. \(1992\). Interpersonal effects in computer-mediated interaction: A relational perspective. *Communication Research*, 19\(1\), 52-90.](#)

[Warburton, S. \(2009\), Second Life in higher education: Assessing the potential for and the barriers to deploying virtual worlds in learning and teaching. *British Journal of Educational Technology*, 40, 414-426. doi: 10.1111/j.1467-8535.2009.00952.x](#)

Figures

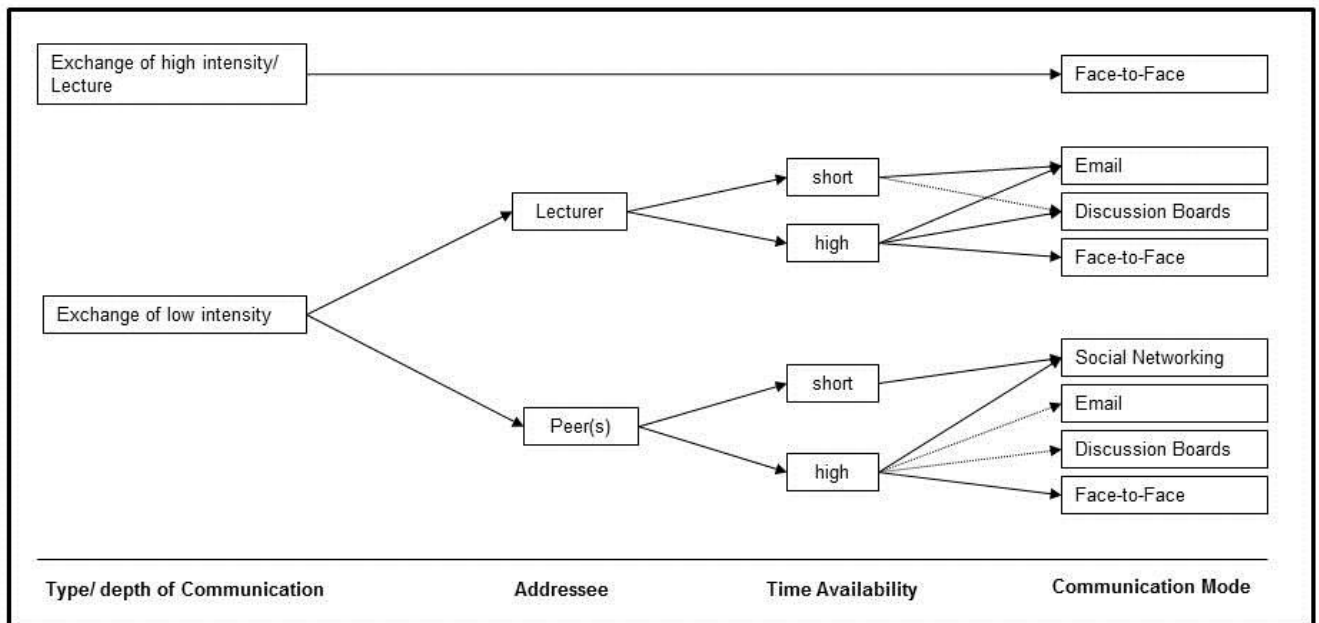


Figure 1. An empirical model of students' communication preferences in educational settings, based on three main themes: (1) Type and depth of communication, (2) Addressee, and (3) Time availability. This model was developed based on exploratory data analysis and cluster analysis to questionnaire items with $n = 98$ students. A straight line indicates that a relationship was emerged directly in the data, a dotted line indicates that the relationship was deduced based on the available data.

Tables

Table 1: Participants' agreement to items relating to face-to-face communication, in total and separated by gender

Item	Percentage of Agreement (Strongly Agree/Agree)		
	Total (<i>n</i> = 98)	Male (<i>n</i> = 18)	Female (<i>n</i> = 80)
Attending lectures are more beneficial than reading slides on Blackboard	87.7	100	85
<i>Reverse:</i> Face to face meetings with lecturers waste time which could be better spent	66.3	55.6	68.8
Meeting with course mates for revision sessions helped more than using social networks	63.3	66.6	62.5
Meeting with course mates inspires me more to do work than communicating online	60.2	72.2	57.5
Having meetings with lecturers is more helpful than exchanging emails	58.2	72.2	55
I prefer meeting with lecturers face to face rather than using email	35.7	77.8	26.3
<i>Reverse:</i> I prefer using the internet to interact with course mates and lecturers rather than face to face meetings	25.5	44.4	21.3
Median Agreement	60.2	72.2	57.5

Note. For reverse items, it is displayed how many participants (strongly) disagreed with the item.

Table 2: Participants' agreement to items relating to communication on discussion boards/ Blackboard, in total and separated by gender

Item	Percentage of Agreement (Strongly Agree/Agree)		
	Total (<i>n</i> = 98)	Male (<i>n</i> = 18)	Female (<i>n</i> = 80)
I feel discussion boards are underused	86.7	88.9	86.3
I would prefer to use discussion boards over Facebook if they were used by more people	64.3	94.4	57.5
Reading slides on Blackboard is easier than attending lectures	30.6	33.3	30
Discussion boards give me a fast response from both lecturers and students	22.4	27.8	21.3
I prefer using discussion boards over Facebook groups	21.4	33.3	18.8
Reading slides on blackboard is just as beneficial as attending lectures	18.4	16.7	18.8
Median Agreement	26.5	33.3	25.7

Table 3: Participants' agreement to items relating to E-Mail communication, in total and separated by gender

Item	Percentage of Agreement (Strongly Agree/Agree)		
	Total (<i>n</i> = 98)	Male (<i>n</i> = 18)	Female (<i>n</i> = 80)
Using university email is an excellent way of interacting with lecturers	88.8	83.3	90
I find emailing subject related questions to lectures gives me more useful responses than posting on Facebook	65.3	83.3	61.3
When time is available I prefer to email lecturers with my questions on their subject	60.2	77.8	56.3
<i>Reverse:</i> I feel embarrassed to email lecturers topic related questions	52	61.1	50
<i>Reverse:</i> Lecturers often do not help when emailed	43.9	50	42.5
I email relevant lecturers topic related questions before posting my queries online	31.6	33.3	31.3
<i>Reverse:</i> When emailing lecturers I worry I will be wasting their time	21.4	33.3	18.8
<i>Reverse:</i> When emailing lecturers I worry about annoying them	21.4	33.3	18.8
Median Agreement	48	55.6	46.3

Note. For reverse items, it is displayed how many participants (strongly) disagreed with the item.

Table 4: Participants' agreement to items relating to social network communication, in total and separated by gender

Item	Percentage of Agreement (Strongly Agree/Agree)		
	Total (<i>n</i> = 98)	Male (<i>n</i> = 18)	Female (<i>n</i> = 80)
I get faster responses when asking questions on Facebook compared with subject discussion boards	77.6	50	83.8
When time is not available Facebook is a faster option	77.6	61.1	81.3
I find it easier to ask questions on Facebook rather than subject discussion boards	69.4	61.1	71.3
I prefer to ask questions on Facebook rather than subject discussion boards	67.3	38.9	72.5
I found instant chat (Facebook chat, Skype ect.) useful when interacting with course mates	60.2	66.7	58.8
It would be a big help if lecturers were able to monitor Facebook groups and answer questions	51.0	50	51.3
<i>Reverse:</i> Facebook groups often give wrong answers to questions	31.6	33.3	31.3
Median Agreement	67.3	50	71.3

Note. For reverse items, it is displayed how many participants (strongly) disagreed with the item.

Table 5: Five-Cluster Solution Resulting from Hierarchical Cluster Analysis on Items

Cluster	Item
Cluster 1: Preference for Social Networking	<p>I prefer to ask questions on Facebook rather than subject discussion boards</p> <p>I find it easier to ask questions on Facebook rather than subject discussion boards</p> <p>I get faster responses when asking questions on Facebook compared with discussion boards or emailing lecturers</p> <p><i>Reverse item:</i> Facebook groups often give the wrong answers to questions</p> <p>When time is not available Facebook is a faster option</p> <p>I found instant chat (Facebook chat, Skype ect.) useful when interacting with course mates</p>
Cluster 2: Preference for direct and contained forms of communication	<p>I feel discussion boards are under used</p> <p><i>Reverse item:</i> I feel embarrassed to email lecturers topic related questions</p> <p><i>Reverse item:</i> Lecturers often do not help when emailed</p> <p>I find emailing subject related questions to lecturers gives me more useful responses than posting on Facebook</p> <p>I would prefer to use discussion boards over Facebook if they were used by more people</p> <p>When time is available I prefer to email lecturers with my questions on their subject</p> <p>Using university email is an excellent way of interacting with lecturers</p> <p>Meeting with course mates for revision sessions helped more than using social networks (Facebook etc.)</p> <p>Having meeting with lectures is more helpful than exchanging emails</p> <p>Meeting with course mates inspires me more to do work than communicating online</p> <p><i>Reverse item:</i> Face to face meetings with lecturers waste time which could be better spent</p> <p>Attending lectures are more beneficial than just reading slides on blackboard</p>
Cluster 3: Preference for directed academic conversation	<p>I email relevant lecturers with subject related questions before posting my query online</p> <p>I prefer using discussion boards over Facebook groups</p> <p>Discussion boards give me a fast response from both lecturers and students</p> <p><i>Reverse item:</i> When emailing lecturers I worry I will be wasting their time</p> <p><i>Reverse item:</i> When emailing lecturers I worry about annoying them</p> <p>I prefer meeting with lecturers face to face rather than using email</p> <p><i>Reverse item:</i> I prefer using the internet to interact with course mates and lecturers rather than face to face meetings</p>
Cluster 4: Preference for online Learning	<p>Reading slides on Blackboard is easier than attending lectures</p> <p>Reading slides on Blackboard is just as beneficial as attending lectures</p>
Cluster 5	It would be a big help if lecturers were able to monitor Facebook groups and answers questions