The impact of micro-cultural roles on email usage, a study of Business Support jobs

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ABSTRACT: *The influence of roles in the use of email has been explored at the meso-cultural level. It was observed that significant differences existed between the groups in a number of markers such as sent and received messages and time spent, perceived manageability. In the same study it was suggested that the same patterns may exist at the micro-cultural level. This paper seeks to explore the perception that the same patterns may exist at the micro-cultural level. The Business Support role has been chosen and within it the top four identified roles selected for further analysis. The roles included were Systems / IT Development, General Admin, Student Support / Learner Services and Assessor / Commercial TrainingFrom the original 1010 responses gathered at the meso-cultural level, 176 fell into the top four Business Support roles and have been used for this study. Differences between the groups were explored using descriptive and statistical methods and some differences were observed between the different roles being explored. The findings demonstrated that there were not significant differences between the groups as observed at the meso-cultural level. Received message load was different at a statistically significant level but sent load, time spent, perceived manageability and perceptions of wastage were not. The Systems /IT development role displayed similar patterns consistent with overload as observed at the meso-cultural level. The findings showed that only 2 of the 12 cultural markers were statistically significant compared to 9 of 12 at the meso-cultural level.*

KEY WORDS: *Management, Email, Communication, Culture*

I. INTRODUCTION

It has been suggested that there is a link between the effective use of email and the relationship between users [1] Cultural markers were used as a basis to suggest that mutual understanding as a result of common cultural markers would enhance relationships and therefore email use. Under this assumption, a less rich means of communication such as email, would become richer where a strong relationship existed [2]. This discussion was furthered by focusing on the influence of role in email usage. At a meso-cultural level, identified roles within the Welsh FE sector were used as a dependent factor with which to test a variety of variables. Significant differences were found between the roles in terms of their email usage, lending weight to the earlier arguments. However, differences would be more marked at a lower cultural level, termed micro-culture, where shared beliefs, values, history, ceremonies and rites[4, 5] would be most evident [1]. It was assumed that at this level the driving factors of cultural development would be most strongly felt. These assumptions were tested by investigating the micro-cultural effects within groups of Academics [6]. The findings of this study showed that significant differences did not persist below the meso-cultural level. This study seeks to confirm these findings by undertaking the same exercise in groups of Business Support users in the same sector.

II. METHOD

Use will be made of the original data set [5, 6] focusing on the Business Support role. The responses were filtered to generate the data set used in this analysis. A total of 321 Business Support staff were filtered representing 15 different jobs at the micro-cultural level. A number of job groups were represented by too few respondents to enable meaningful analysis. In order to conduct the analysis it was decided to filer the top 4 most strongly represented job groups resulting in 176 users being included for analysis. . Due to the balance of respondents, this resulted in an imbalanced data set upon which to conduct the analysis. Unfortunately, this is was unavoidable and is a recognised limitation of the analysis. The groups are shown in Figure 1 below. All analysis conducted will be same as previously undertaken in order to provide a direct comparison [5, 6].

Figure 1. Breakdown of data by job groupings

	Frequency	Percent
Systems, IT development	21	11.9
General admin	91	51.7
Student support / learner services	37	21.0
Assessor / Commercial training activity	27	15.3
Total	176	100.0

III. RESULTS

Sent and received message load along with perception of change are shown in Figures 2 to 5 below. For analytical purposes the number of categories was collapsed to enable a valid chi square test to take place.

Figure 2. The changes in sent message load by Support Employment Group

			[2] Please select the category that best represents your employment [other]				Total
			(S) Systems, IT development	(S) General admin	(S) Student support / learner services	(S) Assessor / Commercial training activity	
How has the volume of sent messages changed in recent years	Increased	Count	14 70.0%	74 82.2%	25 69.4%	21 84.0%	134 78.4%
	Decreased	Count	0 0.0%	3 3.3%	2 5.6%	3 12.0%	8 4.7%
	Stayed the same	Count	6 30.0%	13 14.4%	9 25.0%	1 4.0%	29 17.0%
Total		Count	20 100.0%	90 100.0%	36 100.0%	25 100.0%	171 100.0%

Figure 3. The changes in sent message load by Support Employment Group

			[2] Please select the category that best represents your employment [other]				Total
			(S) Systems, IT development	(S) General admin	(S) Student support / learner services	(S) Assessor / Commercial training activity	
How has the volume of received messages changed in recent years?	Stayed the same	Count	3 14.3%	10 11.0%	5 13.9%	1 3.8%	19 10.9%
	Increased	Count	18 85.7%	76 83.5%	31 86.1%	24 92.3%	149 85.6%
	Decreased	Count	0 0.0%	5 5.5%	0 0.0%	1 3.8%	6 3.4%
Total		Count	21 100.0%	91 100.0%	36 100.0%	26 100.0%	174 100.0%

Figure 4. Number of messages sent per day by Support Employment Group

			[2] Please select the category that best represents your employment [other]				Total
			(S) Systems, IT development	(S) General admin	(S) Student support / learner services	(S) Assessor / Commercial training activity	
[7] On average, how many emails do you send in a day?	0 - 10	Count	4 19.0%	28 30.8%	16 43.2%	16 61.5%	64 36.6%
	11 - 20	Count	9 42.9%	20 22.0%	11 29.7%	4 15.4%	44 25.1%
	21 - 30	Count	4 19.0%	26 28.6%	7 18.9%	3 11.5%	40 22.9%

						Total
31 - 40	Count	2 9.5%	8 8.8%	2 5.4%	2 7.7%	14 8.0%
41 - 50	Count	0 0.0%	7 7.7%	0 0.0%	0 0.0%	7 4.0%
51 - 60	Count	1 4.8%	1 1.1%	1 2.7%	1 3.8%	4 2.3%
61 - 70	Count	0 0.0%	1 1.1%	0 0.0%	0 0.0%	1 0.6%
71 - 80	Count	1 4.8%	0 0.0%	0 0.0%	0 0.0%	1 0.6%
Total	Count	21 100.0%	91 100.0%	37 100.0%	26 100.0%	175 100.0%

Figure 5. Number of messages received per day by Support Employment Group

			[2] Please select the category that best represents your employment [other]				Total
			(S) Systems, IT development	(S) General admin	(S) Student support / learner services	(S) Assessor / Commercial training activity	
[9] On average, how many emails do you receive in a day?	0 - 10	Count	2 10.0%	18 19.8%	7 18.9%	7 25.9%	34 19.4%
	11 - 20	Count	4 20.0%	25 27.5%	17 45.9%	10 37.0%	56 32.0%
	21 - 30	Count	4 20.0%	24 26.4%	8 21.6%	8 29.6%	44 25.1%
	31 - 40	Count	1 5.0%	12 13.2%	4 10.8%	1 3.7%	18 10.3%
	41 - 50	Count	4 20.0%	7 7.7%	0 0.0%	0 0.0%	11 6.3%
	51 - 60	Count	0 0.0%	3 3.3%	1 2.7%	0 0.0%	4 2.3%
	61 - 70	Count	2 10.0%	2 2.2%	0 0.0%	1 3.7%	5 2.9%
	71 - 80	Count	1 5.0%	0 0.0%	0 0.0%	0 0.0%	1 0.6%
	81 +	Count	2 10.0%	0 0.0%	0 0.0%	0 0.0%	2 1.1%
Total		Count	20 100.0%	91 100.0%	37 100.0%	27 100.0%	175 100.0%

The average time spent for each of the jobs was gathered using a sliding scale from 0 to 180 minutes. Systems and IT Development spent on average 68.57 minutes per day, General Admin spent 72.54 minutes per day, Student Support / Learner Services spent 62.35 minutes per day and Assessor / Commercial Training spent 53.70 minutes per day.The number of messages that users perceived were manageable to send and receive in a day was gathered using an open ended text box. Systems and IT Development perceived that an average of 22.89 messages could be sent and 27.37 could be received. General Admin perceived that an average of 26.78 messages could be sent and 23.62 could be received. Student Support / Learner Services perceived that an average of 19.18 messages could be sent and 18.06 could be received. Assessor / Commercial Training perceived that an average of 19.40 messages could be sent and 20.29 could be received.Figure 6 below illustrates the proportions of respondents who wished to change their email usage. This was followed up by an open ended question asking respondents to justify their answers. The key reasons reported were volume and content management, to receive fewer unsolicited emails and a desire to improve interpersonal contact. For those who did not wish to change their usage, respondents generally believed that the current levels of usage are manageable but should not increase.

Figure 6. The desire to change email use by Support Employment Group

			[2] Please select the category that best represents your employment [other]				Total
			(S) Systems, IT development	(S) General admin	(S) Student support / learner services	(S) Assessor / Commercial training activity	
[13] Would you like to change your email usage?	Yes	Count	7	18	6	5	36
			33.3%	19.8%	16.2%	18.5%	20.5%
	No	Count	14	73	31	22	140
			66.7%	80.2%	83.8%	81.5%	79.5%
Total		Count	21	91	37	27	176
		% within [2] Please	100.0%	100.0%	100.0%	100.0%	100.0%

Respondents were asked whether they consider others before sending emails. The results are shown in Figure 7 below. Respondents were also asked to justify their responses. The main themes reported were that users tended to consider their own and others' time management and expectations as well as the appearances and interpretation of the messages they were sending.

Figure 7. Consideration of others when sending emails by Support Employment Group

			[2] Please select the category that best represents your employment [other]				Total
			(S) Systems, IT development	(S) General admin	(S) Student support / learner services	(S) Assessor / Commercial training activity	
[14] In general, do you consider the impact on the recipient before sending emails?	Yes	Count	18	77	31	20	146
			85.7%	85.6%	83.8%	74.1%	83.4%
	No	Count	3	13	6	7	29
			14.3%	14.4%	16.2%	25.9%	16.6%
Total		Count	21	90	37	27	175
			100.0%	100.0%	100.0%	100.0%	100.0%

Respondents were asked to report whether they waste any time when using email. The results of this can be seen in Figure 8 below. Those who answered yes to this were then asked to provide an estimate of what proportion of time they spend using email is wasted. Systems and IT Development reported an average of 19.73% wastage. General Admin reported an average of 16.69% wastage. Student Support / Learner Services reported an average of 19.36% wastage. Assessor / Commercial Training reported an average of 17.31% wastage. The main reason for wasted time provided by respondents was the receipt of work related emails that are not relevant or duplicated. Respondents were also asked to identify behaviours from a list established through review of existing literature (Figure 9 below.)As well as identifying behaviours, users were asked to select the one that they thought was most important and provide an example. The most commonly reported related to irrelevant content or repeated messages. Poorly written messages, and those sent to avoid face to face contact were also reported

Figure 8. The perceptions of wasted time when using email by Support Employment Group

			[2] Please select the category that best represents your employment [other]				Total
			(S) Systems, IT development	(S) General admin	(S) Student support / learner services	(S) Assessor / Commercial training activity	
[17] Do you waste any time using email?	No	Count	10	46	20	16	92
			47.6%	51.1%	55.6%	59.3%	52.9%
	Yes	Count	11	44	16	11	82
			52.4%	48.9%	44.4%	40.7%	47.1%
Total		Count	21	90	36	27	174
			100.0%	100.0%	100.0%	100.0%	100.0%

Figure 9. Wasteful behaviours by Support Employment Group

Response	Systems and IT Development	General Admin	Student Support / Learner Services	Assessor / Commercial Training
Inappropriate content	28.6%	9.9%	13.5%	14.8%
Aggressive tone	19.0%	25.3%	24.3%	29.6%
Bullying	4.8%	2.2%	8.1%	3.7%
Content you found offensive	0.0%	5.5%	8.1%	7.4%
Sent by the sender to avoid face to face contact	57.1%	39.6%	51.4%	51.9%
Poorly written	66.7%	62.6%	51.4%	70.4%
Hastily composed without due consideration	47.6%	51.6%	40.5%	66.7%
Content that is not relevant to you	81%	72.5%	75.7%	66.7%
Same message from multiple sources	42.9%	44.0%	51.4%	48.1%
None of the above	4.8%	11,0%	10.8%	11.1%

Figures 10 to 12 below illustrate the responses to questions about attendance at training. The questions focused on whether users had attended training in the past 12 months, the nature of the training, whether it was relevant and if not, why not. The information on why training was not relevant was gathered using an open ended question and the main themes were that the training was not relevant to the groups or it failed to achieve the stated aims.

Figure 10. The attendance at email training within the past 12 months by Support Employment Group

			[2] Please select the category that best represents your employment [other]				Total
			(S) Systems, IT development	(S) General admin	(S) Student support / learner services	(S) Assessor / Commercial training activity	
[22] Have you attended training on the use of email in the past 12 months?	Yes	Count	4	9	9	4	26
			19.0%	9.9%	24.3%	14.8%	14.8%
	No	Count	17	82	28	23	150
			81.0%	90.1%	75.7%	85.2%	85.2%
Total		Count	21	91	37	27	176
			100.0%	100.0%	100.0%	100.0%	100.0%

Figure 11. Whether the training attended was relevant to the respondents' role by Support Employment Group

			[2] Please select the category that best represents your employment [other]				Total
			(S) Systems, IT development	(S) General admin	(S) Student support / learner services	(S) Assessor / Commercial training activity	
[22b] If you did attend training, was it appropriate for your role?	Yes	Count	3	13	6	4	26
			33.3%	56.5%	50.0%	40.0%	48.1%
	No	Count	6	10	6	6	28
			66.7%	43.5%	50.0%	60.0%	51.9%
Total		Count	9	23	12	10	54
			100.0%	100.0%	100.0%	100.0%	100.0%

Figure 12. The nature of the training undertaken by Support Employment Group

			[2] Please select the category that best represents your employment [other]				Total
			(S) Systems, IT development	(S) General admin	(S) Student support / learner services	(S) Assessor / Commercial training activity	
[22] Have you attended training on the use of email in the past 12 months? [other]	Software or hardware training	Count	2	7	5	3	17
			50.0%	87.5%	71.4%	75.0%	73.9%
	Content management training	Count	0	0	1	1	2
			0.0%	0.0%	14.3%	25.0%	8.7%
	Accredited course	Count	1	0	1	0	2
			25.0%	0.0%	14.3%	0.0%	8.7%
	Other training	Count	1	1	0	0	2
			25.0%	12.5%	0.0%	0.0%	8.7%
Total		Count	4	8	7	4	23
			100.0%	100.0%	100.0%	100.0%	100.0%

IV.   DISCUSSION

The results illustrate the differences and similarities between user group profiles at the micro cultural level within the Welsh Further Education Sector. When considering drawbacks and benefits of email, it can be seen that there are few substantial differences between the examples provided. In terms of drawbacks, the Systems and IT Development job is much more likely to identify that excessive load and time wastage are drawbacks to email usage. Despite reporting this, the Systems and IT Development job was no more likely to believe that loads had changed in recent years. However, whilst this job is sending fewer messages that the perceived maximum (22 actual against 22.89 perceived maximum) they are receiving a significant number more than the perceived maximum (38 actual against 27.37 perceived maximum). This further lends weight to the assertions that received message load is a key factor in email overload [7, 8]. This pattern was also observed when looking at meso cultural roles [3]. When compared to other jobs, the Systems and IT Development job also identified time wastage as a drawback to email usage in a greater proportion of cases. Whilst the percentages are not high, it is worth noting this job reported the highest proportion of time wasted at 19.73%. The perception that time is being wasted can be combined with the observation of actual versus perceived maximum load to form an indicator of overload.

The Assessor / Commercial Training and Student Support / Learner Services jobs identified most strongly that the potential for damaging messages was a drawback. This concern is a very real one, as the potential damage caused by poor cyber behaviour, whether or not there is intent, can have an effect on the organisation as a whole [9]. Such potentially damaging messages may have the effect of reducing work effort, a reduction in the help offered to co-workers and future interactions with the person from whom they perceive the damaging message to have come [10].Why it should be the case that these two jobs perceive this drawback more strongly is difficult to assess from the data. All jobs used in this analysis perceived the potential for damaging messages as a drawback which is consistent with the findings for the Business Support role, from which each of these jobs are drawn [3].

Reliance on computer systems and the potential for misinterpretation were most strongly identified by the General Admin job. Individuals in this job were least likely to have attended training in the past 12 months which may explain their concern over the reliance and use of computer systems. This is backed up by the observation that where training was attended, it was in relation to software or hardware use and was useful. This indicates that the General Admin job may benefit from further training which could reduce the effect of this drawback.The concern over the potential for misinterpretation is harder to attribute to this job. Overall, the Business Support role most strongly identified both the reliance on computer systems and the potential for misinterpretation as drawbacks [3]. Observation of the analysis of jobs within the Business Support role shows that a heavy influence on this is the opinion of those employed in General Admin jobs. In terms of key benefits, speed, reliability and ease was identified most frequently by the Systems and IT Development job. It is considered that this finding is consistent with the nature of the job undertaken. Senior managers identified most strongly with this benefit [3] and attributed it to the observations that senior managers had the greatest influence over the adoption of email [11].

Systems and IT Development personnel will have the greatest influence over the dissemination and execution of email systems and strategies and are likely to view the benefits in a similar way. This benefit may also be perceived this way as those employed in the role use IT equipment and are more familiar with its use on a day to day basis. Email was a better tool for communication than other methods through a study conducted in a computer company [12]. This backs up the assertion that those employed in an IT and Systems Development job will view email more positively because of their professional identification with the technology. General Admin and Student Support / Learner Services jobs viewed the record of messages as a benefit more strongly than the other jobs. Emails can be stored as a record of what has been undertaken or work left to be done as well as being in place to protect individuals from cases of bullying or harassment [13, 14]. The work undertaken by these jobs may make these benefits more important. Sent and received messages were recorded for each of the groups discussed. Systems and IT Development groups sent 22 messages per day, General Admin sent 15, Student Support / Learner Services sent 15 and Assessor / Commercial Training sent 14 messages per day. However, the use of Chi-Square illustrates that there is no statistically significant difference in sent messages volumes between the different groups (x=10.971 p=0.278). This suggests that when considering the impact of culture on sent message load, differences can only be observed as low as the meso-cultural level when studying the Business Support role [3]

The Assessor / Commercial Training group was most likely to send messages in the lowest 0 – 10 category and less likely to send higher levels of messages than other roles. Systems and IT Development groups were least likely to send messages in the 0 – 10 category and most likely to send messages in the 11 – 20, 31 – 40, 51 – 60 and 71 – 80 categories. It is worth noting that the actual numbers of individuals sending messages in the higher categories is very low. Student Support / Learner Services groups also tended to send lower volumes of messages with the vast majority sending less than 20 on a daily basis. Similar patterns can be observed with the other groups studied with the exception of General Admin staff that had the fewest responses sending fewer than 20 messages daily. Possible reasons for the differences in sending behaviours may have root in the nature of the work undertaken. Systems and IT Development staff may be spending significant proportions of their time responding to and actioning requests rather than generating content themselves. However, it is difficult to make a comparison as there are no other email volume studies that use similar categories for analysis.

Conversely, General Admin staff may be either generating more requests or responding to emails sent to them. Student Support / Learner Services and Assessor / Commercial Training, whilst technically support groups, see individuals in contact with students and candidates and therefore away from email contact. This would explain the high proportions of messages sent in the under 20 categories. When considering received messages there is a difference from the sent message patterns. 30% of the Systems and IT Development group received 20 messages or fewer compared to 47.3% of General Admin, 64.8% of Student Support / Learner Services and 63.9% of Assessors / Commercial Training groups. This suggests that the Systems and IT Development group receives significantly more messages than the other groups. This assertion is backed up by cumulative average calculations showing that the Systems and IT Development group receives 38 messages per day, General Admin receive 24, Student Support / Learner Services receive 19 and Assessor / Commercial Training receive 19. Chi-Square testing shows that the pattern of received messages is influenced by group at a statistically significant level ($x=33.856$ $p=0.000$). Whilst not comparative studies, observations in high technology organisations have observed high usage levels for IT professionals [15, 16]. This is a significant observation as received messages continue to be the biggest indicator of overload [3, 7, 8] These findings to differ as where no significant differences were observed relating to received load [3].

High levels of received messages should not be considered enough to suggest overload, however, when taken into consideration alongside the perceived maximum number of messages manageable to send and receive, context needs to be provided [3]. In terms of sent messages, all groups report sending an average of fewer messages than are perceived to be manageable to send. This suggests that sent message load is not acting as a contributor to overload. ANOVA tests show that there is no significant difference in the perceived number of messages manageable to send based on group (overall $p=0.185$ with significance values ranging between roles from $p=.220$ to $p=1.000$). It appears that in the case of Business Support, micro cultural groups are not impacted by the perception of manageability in terms of sent messages. Findings are similar to previous studies but the lack of statistical difference is stronger [6]. In terms of received messages, all groups with the exception of Assessor and Commercial Training received greater numbers of messages than they perceived to be manageable. The extent to which excessive loads were received varies. The Systems and IT Development group receive in excess of 10 messages on average more than they perceive is manageable to receive whereas General Admin and Student Support / Learner Services groups only receive very slightly more (0.38 and 0.94 messages respectively).

ANOVA testing shows that there is little significant difference between groups in terms of the perception of messages manageable to receive (overall $p=0.91$ with significance values ranging between groups from $p=0.104$ to $p=0.935$). These findings suggest that at the micro-cultural level within the Business Support role there is no evidence to suggest that perceptions of manageability in terms of sent and received messages is influence by job group. This suggests that influence exerted by role progresses no further than the meso-cultural level. Descriptive analysis does demonstrate that the Systems and IT Development group is most likely to receive greater loads than they perceive to be manageable and may therefore experience feelings of overload. All groups believed that the volume of sent and received messages had changed in recent years. General Admin and Assessor / Commercial Training groups were most likely to perceive this to be the case for sent messages. However, the average load sent by these groups is not the highest. This suggests that the proportion of the work undertaken by these groups via email has increased rather than the figures being indicative of an overall increase. However, Chi square tests illustrate that there is no statistical significance to suggest that the perception of increase in sent messages is dependent on micro-cultural group ($x=11.213$ $p=0.082$) A slightly different pattern can be seen in the perception of changes to received messages. A very high proportion of all the groups perceived that received message loads had increased. The Assessor / Commercial Training group perceived this the most.

However, this is the only group to identify received loads as lower than perceived maximum manageable. Chi square tests once again reveal that the perception of increase in received messages is not associated with micro-cultural group (x=4.967 p=0.548). Figure 13 below represents a repeat of the ranking system carried out in previous studies [3. 6] to assess whether the differences between actual and perceived manageable sent and received messages and perceptions of increase exists in groups at the micro-cultural level.

Figure 13. Differences between actual load and perceived manageability related to the perceptions of increase, by Business Support Group

	Mean Sent	Mean Manageable	Diff.	Rank	% increase	Rank
Systems / IT Development	22	22.89	-0.89	4	70.0%	2
General Admin	20	26.78	-6.78	1	82.2%	3
Student Support / Learner Services	15	19.18	-4.18	3	69.4%	4
Assessor / Commercial Training	14	19.40	-5.40	2	84.0%	1

	Mean Received	Mean Manageable	Diff.	Rank	% increase	Rank
Systems / IT Development	38	27.37	+11.37	1	85.7%	3
General Admin	24	23.62	+0.38	3	83.5%	4
Student Support / Learner Services	19	18.06	+0.94	2	86.1%	2
Assessor / Commercial Training	19	20.29	-1.29	4	92.3%	1

There is no pattern observed between the difference between actual and perceived maximum load and desire to change email usage. This is different to the pattern observed by Silverstone (2014a) where a clear pattern could be observed. This suggests that the meso-cultural level is the limit at which influence can be observed There is a clear relationship between the perceived maximum manageable for sent and received messages. For the whole sample group r=0.737 n=174 p=0.000. This is a similar relationship as observed previously for the whole sample group [3]. For the Systems and IT Development group r=0.631 n=21 p=0.003, it is worth noting the small sample size for this correlation. For the General Admin group r=0.797 n=91 p=0.000. For the Student Support / Learner Services group r=0.792 n=37 p=0.000, again it is worth noting the small sample size. Finally, for the Assessor / Commercial Training group r=0.730 n=27 p=0.000, the sample size is small once again. The correlation suggests that the perception that sent and received messages should balance when looking at meso-cultures [3], is also found at the micro-cultural level. This pattern was also observed when the Academic role was studied [6] and is the only component analysed that is the same across all analyses, this is shown in Figure 15 at the end of the paper.

A one way ANOVA test was used to explore the relationship between micro-cultural role and time spent daily using email. For the whole study a significance of p=0.248 was calculated illustrating that micro-cultural group does not significantly impact on the time spent using email. Between the different groups the significance of the difference ranged from p=0.227 to p=0.983 illustrating that whilst there is some difference it is not at a significant level. With no significant difference being observed here, as has been observed throughout this analysis, it seems that micro-cultural groups do not demonstrate the same difference in email usage patterns as observed at the meso-cultural level. Again, little can be gained from existing literature about the reasons behind the lack of significant difference. A link between the difference in actual against manageable loads and desire to change email usage was suggested [3]. The same calculations have been applied here and are shown in Figure 14 below. The same pattern is not observed as at the meso-cultural level where the difference was followed by a corresponding desire to change. However, the group with the biggest difference also had the highest desire to change usage. This lends weigh to the assertion that as overload increases, so will the desire to change usage.

Figure 14. The relationship between overload and the desire to change by business support job

	Cumulative Difference (actual vs. manageable)	Rank	Desire to change (yes)	Rank
Systems / IT Development	+10.48	1	33.3%	1
General Admin	-6.4	4	19.8%	2
Student Support / Learner Services	-3.24	2	16.2%	4
Assessor / Commercial Training	-6.69	3	18.5%	3

Unlike at the meso-cultural level there are different reasons cited by different groups to justify their desire to change. For the Systems and IT Development group the desire to improve personal contact was cited as the greatest reason. For the General Admin group there was a split between volume and content management, the desire for fewer unsolicited emails and the desire to improve personal contact. For the Student Support and Learner Services group there was a split between time constraints and the desire for fewer unsolicited emails and for the Assessor and Commercial Training group there was a split between volume and content management and the desire for fewer unsolicited messages.

It is considered that these differences in reasons for the desire to change may be attributed to group. In the case of the Systems and IT Development group, they exhibit signs of received messages load and may wish to reduce this in favour of greater face to face contact. Applying a filter to isolate the users who said that they wished to change their email usage showed an average sent message load of 23.99 against a perceived maximum of 22.66. An average received load of 31.36 messages against a perceived maximum of 20.21 was also observed. This further suggests that received message load has a significant impact on users' desire to change their email usage. Three of the four groups analysed had similar proportions of respondents who believed that they considered the needs of others before sending emails. The Assessor / Commercial Training group had a greater proportion who reported that they did not consider others' needs, the issue of generating excessive load by not considering the needs of the recipient is discussed at length in the available literature [17, 18, 7, 19]. On the whole this has been adopted but not by the Assessor / Commercial Training group.

When investigating the reasons given for considering others there were differences when compared to those at the meso-cultural level. The Systems and IT Development group were most likely to identify that time management of self and others to be the main consideration of others. However, this group was also most likely to identify that email was part of the job and therefore consideration was not that important. This group was least likely to identify that the appearance and interpretation of the message as a reason for considering others. Conversely, the Assessor / Commercial Training group was least likely to consider time management of self and others as a reason for considering others but most likely to consider that the appearance and interpretation of the message as a reason. The General Admin and Student Support / Learner Services groups returned similar reasons for considering others but General Admin were less likely to consider that email was an integral part of the job and more likely to identify that other means of communication may be more appropriate. There are some differences between the groups in terms of identifying that they waste time when using email, however, the difference is not significant (p=0.828). The Systems / IT Development group was most likely to identify that time was wasted, this role also had the greatest difference between actual and perceived maximum and were most likely to wish to change their usage.

The pattern observed here is similar to that previously observed [3] and therefore these measures taken together seem to provide a strong indicator of overload within groups. The reasons for wasted time also varied. The Systems / IT Development group were most likely to waste time with work related emails that were not relevant or were duplicated. Similar responses were observed for the Student Support / Learner Services group. For all groups, this was the most important reason for waste of time. The difference in percentage can be offset by the proportions who failed to report an answer and interestingly, the Assessor / Commercial Training group, who were most likely to identify that time was wasted, had the highest proportion of no response when questioned about how time was wasted. However, the proportion of time wasted does not necessarily follow the identification that time is wasted. Whilst the Systems / IT Development group had the greatest proportion of wasted time and the highest proportion of individuals identifying that time is wasted, the pattern does not persist for the other groups. A better indicator appears when the proportion of wasted time is matched with the issue of work related mails that are not relevant or duplicated where, if the groups are ranked, the pattern is identical. This suggests that time is wasted significantly by these types of messages.

The same inappropriate measures were applied to these jobs as applied in previous research [3]. The most widely reported examples are poorly written emails and content that is no relevant to the recipient. This is consistent with the other information gathered about wastage. The Systems / IT Development group reported high levels of messages being sent to avoid face to face contact and the receipt of content that is not relevant to the recipient. These behaviours contribute to overload. However, despite identifying the issue, this role did not identify the issue of avoiding face to face contact strongly as a primary issue. For the Systems / IT Development group the issue of irrelevant content was the primary issue. This issue is also the primary concern of all the other roles being studied. Despite the indications of overload, e-mail is embedded within the Systems / IT Development group and therefore there is always going to be tension between the two.

Very few respondents reported taking part in training within the past 12 months and as such the analysis may be unreliable. The Student Support / Learner Services group was slightly more likely to have attended training than the other groups. All groups were more likely to identify that training was not appropriate, Systems and IT Development more so than the other groups. The majority of training for all groups was software or hardware training.

Figure 15. Statistical significance tests for meso and micro-cultural differences including findings of Silverstone (2014a and b)

Test	Silverstone (2014a)	This study	Silverstone (2014b)
Sent message load (Chi Square two tailed, significance p=0.05)	X=235.516, p=0.000	X=10.971, p=0.278	With UA X=15.235, p=0.229 Without UA x=912, p=0.179
Received message load (Chi Square two tailed, significance p=0.05)	X=237.404, p=0.000	X=33.856, p=0.000	With UA X=8.912, p=0.179 Without UA x=14.014, p=0.122
Sent message manageability (one way ANOVA test, significance at p=0.05)	Whole study (p=0.000) A & all (p=0.000) MM & BS (p=0.681) MM & SM (p=0.012) BS & SM (p=0.001)	Whole study (P=0.185) range (p=0.220 to p=1.000)	With UA, whole study (p=0.474) Without UA, whole study (p=0.469)
Received message manageability (one way ANOVA test, significance at p=0.05)	A & all (p=0.000) MM & BS (p=0.149) MM &SM (p=0.022) BS and SM (p=0.000)	Whole study (p=0.91) range (p=0.104 to p=0.935)	With UA, whole study (p=0.384) Without UA, whole study (p=0.790)
Increase in sent load (Chi Square two tailed, significance p=0.05)	X=15.149, p=0.19	X=11.123, p=0.082	(x=10.305, p=0.244)
Increase in received load (Chi Square two tailed, significance p=0.05)	X=10.043, p=0.123	X=4.967, p=0.548	X=9.124, p=0.332)
Correlation for perceived maximum sent and received (bivariate Pearson's correlation, two tailed, significance at p=0.05)	R=0.736, n=848 P=0.000	R=0.737, n=174, p=0.000	With UA r=0.461, n=413, p=0.000 Without UA r=0.583, n=259, p=0.000
Time spent using email (one way ANOVA test, significance at p=0.05)	Whole study (p=0.000) SM & BS (p=0.000) SM & A (p=0.000) SM & A (p=0.997) BS + A & all (p=0.000)	Whole study (p=0.248) range (p=0.227 to p=0.983)	With UA, whole study (p=0.097) Without UA, whole study (P=0.066)
Desire to change usage	X=55.141, p=0.000	X=2.637, p=0.451	X=4.431, p=0.351
Consideration of others when sending email	X=3.926, p=0.270	X=2.086, p=0.555	X=8.876, p=0.070
Perceptions of wastage	X=31.792, p=0.000	X=0.891, p=0.828	With UA x=16.410. p=0.003 Without UA x=16.289, p=0.001
Amount of wasted time	Whole study p=0.016 range (p=0.008 to 0.981)	Whole study p=0.911 range (p=0.930 to p=1.000	With UA p=0.422 Without UA p=0.319
Number of items where significance is achieved	9	2	2

V. CONCLUSIONS

Some differences in the ways that the identified groups view and use email have been demonstrated. However, there is no significant statistical evidence to show that differences can be attributed to group. Statistical differences can be seen in relation to received messages but for sent messages, time spent, perceived maximums and perceptions of wastage there is no statistical evidence to support the assertion that groups at a

micro-cultural level influence email behaviour. The vast majority of analytical similarities do not persist between the meso-cultural level and this level. Importantly, only 2 of the 12 statistical markers are significant when compared to 9 of 12 observed in a study of the Academic role [6]. However, this is the same number of statistical markers as observed in the Academic role analysis [6] although the exact markers, as shown in Figure 15, are slightly different. Whilst the results do suggest that difference do not persist when looking at jobs in the Business Support role, it is important to take note of the small sample size used in this case. With such a small sample size there is the potential for the results to be less reliable. However, very similar results were observed in Academic groups [6]which strongly supports these findings.

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