

Intercultural differences in e-learning styles of European business students

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Abstract

Modern European societies now make extensive use of ICT to facilitate the learning process. However, there is a tension between the use made of technology by the individual (perhaps, isolated) student and the potential for e-learning utilised in a more interactive way through virtual learning environments and the like.

This paper reports on the results of a questionnaire distributed to business students in three differing European societies (UK, Spain, Czech Republic). Data was gathered on the time spent using ICT tools to research assignments as well as tapping some overall perspectives on orientations to study in the modern university. Some of the continuities and discontinuities revealed by the survey will be discussed.

Expansion of higher education in all European societies has, in part, been facilitated by the rapid adoption of e-learning technologies. Considerable research attention has been focused upon the possibilities afforded by the new technology including (but not confined to) virtual and managed learning environments in university systems. At the same time, disquiet has been expressed concerning the instrumentalism demonstrated by the new student community in which the learning process has been modified into the successful acquisition of units (module grades) which contribute to the gaining of a 'good' ultimate grade to enhance opportunities in the labour market upon graduation. This intercultural survey may serve to demonstrate whether this instrumentalism is culturally specific or more widely shared in a variety of European societies.

Keywords: inter-cultural differences, inter-cultural survey, European business studies students, Generation Y

Introduction

The higher educational systems of all societies have all been greatly affected by the extensive deployment of ICTs. Students entering higher education will not only have expectations of extensive personal computing power in a college environment at their disposal but will increasingly have access to similar technologies – and mobile, hand-held technologies – in a domestic environment. One lecturer is even pioneering the use of podcasts as a complete replacement for the traditional lecture:

A Bradford University lecturer claims to be the first UK academic to abolish lectures completely in favour of podcasts. First year students taking Bill Ashraf's biochemistry course next year won't have to go to a lecture theatre. Instead they'll watch or listen to virtual lectures on their MP3 players, phones or computers in their own time.

(Source: Stothart, C., 2006)

The increasing availability of such technologies facilitated by their diminishing costs could lead to a situation in which all European societies, subject to the same global influences, utilise the developing technologies at approximately the same rate. This is redolent of what was known as the 'logic of industrialism' and it might be seem to be a reasonable hypothesis that all students undertaking courses of higher education would have similar patterns of usage of contemporary ICT. On the other hand, there a multiplicity of economic and cultural influences at work that could facilitate or hinder adoption of new technologies. Despite efforts at harmonisation, there will still be some 'stickiness' in the markets for electronic and consumer goods. British consumers are often disconcerted to find that goods quoted for them in pounds sterling can be obtained at a similar face-value price in dollars (often 40%-45% cheaper) It is also the fact that new technologies are not often, in practice, adopted at the same rate.

This paper reports on the results of a survey designed to explore how students in similar courses (business, management and economic studies) in three differing European societies utilise web-based and mobile technologies in their university work. Three universities were selected which offered similar provision and these were one from the UK (Anglo-Saxon culture), one from Spain (Latin culture) and one from the Czech Republic (Central European culture). The numbers and genders of those participating in the survey are indicated below:

Q1 Gender (by Country)

Country	Males	Females	All
Czech Republic	164 (79.6%)	42 (20.4%)	206
UK	44 (46.8%)	50 (53.2%)	94
Spain	19 (19.8%)	77 (80.2%)	96
Totals	227 (57.3%)	169 (42.7%)	396

It can be seen that the distribution of genders is interesting in that 4/5ths of the students in the Czech Republic university are male whilst a similar proportion in Spain are female. The UK sample indicates a more even split. The impact of gender is explored more systematically in the analyses that follow.

Access to the Internet

The most basic in the question was the question 'Do you have access to the Internet at your home (local) address?'

The responses in the survey by country:

Q3 Access to the Internet at your home? (by Country)

Country	Yes	No	All	National Usage %
Czech Republic	184 (89.3%)	22 (10.7%)	206	49.9%
UK	86 (93.5%)	6 (6.5%)	92	62.9%
Spain	50 (52.1%)	46 (47.9%)	96	38.7%
Totals	320 (81.2%)	74 (18.8%)	394	
Chi-Square = 71.351, DF = 2, P-Value = 0.000				

The National Usage figures are derived from Internet World Stats(2006) – they provide a context for the country figures. The lower Spanish figure reflects the lower penetration of Internet usage in Spanish society as a whole. An analysis by gender reveals significantly more access by males (90%) than females (69%)

Q3 Access to the Internet at your home? (by Gender)

Gender	Yes	No	All
Male	203 (90.2%)	22 (9.6%)	225
Female	117 (69.2%)	52 (30.8%)	169
Totals	320 (81.2%)	74 (18.8%)	394
Chi-Square = 27.878, DF = 1, P-Value = 0.000			

The next area to be explored was the amount of time spent in browsing the web and processing emails. The question asked was:

- Q4 How many minutes do you spend per day at home**
(a) browsing the web
(b) processing your emails

The composite results are presented in a table below, which also incorporates the results of an ANOVA analysis.

Country	Browsing the web	Processing emails	Web+email combined
Czech	92.0	15.7	107.7
UK	60.4	19.2	79.6
Spain	46.3	13.0	59.3
Average	76.9	16.2	93.1
ANOVA F scores and probabilities	9.34 (p=0.000)	1.89 (p=0.152)	7.84 (p=0.000)

The ANOVA indicates that the observed differences achieve statistical significance. The most dramatic difference is the extent to which the Czech students browse the web for over 50% longer than their UK counterparts.

The t-test for Gender also shows that the mean for males on-line (101 minutes per day) is significantly higher than that for females (83.0 minutes per day). What is interesting here is that whilst male students spend significantly longer browsing the web (86 minutes as opposed to 60 minutes), female students spend significantly longer emailing (21 minutes as opposed to 13 minutes) When combined, the longer times spent by males browsing pulls the combined figure into overall statistical significance

Q4 Minutes spent reading browsing AND reading emails (by gender)

Two sample T for All					
Gender	N	Mean	StDev	SE Mean	National UK figures*
Males	207	100.7	96.8	6.7	172
Females	114	83.0	64.0	6.0	156
95% CI for mu (1) - mu (2): (-0.0, 35.4)					
T-Test mu (1) = mu (2) (vs not =): T = 1.96 P = 0.050 DF = 308					

*Source: New Mind(2006)

The national figures for the UK probably reflect some occupational usage, but it is interesting that this figure does indicate that students' access times lag behind (and do not exceed) the general population figures. The male/female imbalance is also indicated (and is also statistically significant)

Using the Internet to prepare assignments

Current generations of students have unparalleled opportunities to utilise the resources of the net in order to research and prepare their assignments. In some cases, this can lead to abuses as concerns mount over the degree to which material is 'cut-and-pasted' directly into assignments ie. plagiarised. The degree to which students utilise the web in the preparation of a typical assignment is somewhat under-researched and so this survey asked the question:

- Q5 For a typical assignment, indicate how many hours you would spend to the nearest tenth**
(a) searching the web for specific information
(b) reading books, periodicals, other written materials

Country	Searching the web	Reading books and periodicals	Combined
Czech	3.68	3.06	6.74
UK	5.58	5.72	11.30
Spain	2.29	2.58	4.87
Average	3.78	3.56	7.34
ANOVA F scores and probabilities	12.86 (p=0.000)	5.91 (p=0.003)	5.05 (p=0.007)

The data appears to indicate that UK students utilise the web for more than twice the period of time than the other two samples. However, we must not draw too many conclusions from this fact as exact comparisons would need to take into account the total student assignment load, the proportion to which this contributes to the overall assessment and several other cultural and institutional factors. Of more interest, however, is the balance of the student research time split between 'electronic' modes of access v. more traditional academic materials such as books and periodicals. Females spent 3.24 hours compared with 3.15 hours for male students but this difference is not statistically significant.

The same caveats apply to more conventional academic researches. However, of particular interest to us here is the **balance** of time, split between web-based and traditional academic researchers. The following constructed table helps us to highlight the key data here:

Country	Internet hours	Traditional hours	Excess of traditional over internet hours	% difference: Traditional v web-based access
Czech	3.68	3.06	-0.62	-16.7%
UK	5.58	5.72	0.14	+ 2.5%
Spain	2.29	2.58	0.29	+12.7%
Average	3.78	3.56	-0.22	- 5.8%

It is interesting to note that traditional sources of academic information are now being replaced by web-sourced materials, although it achieves almost an equal balance in the UK case. An ANOVA analysis reveals that the differences noted do not achieve any statistical significance.

Are students increasing instrumental in their orientations towards higher education?

The imminent rise in UK fee levels to £3000 in the Autumn of 2006 (and a predicted rise to over £5,000 pa in 2010 when the present 'cap' on fees is removed) is likely, in the view of many academics, to lead to an increasingly consumerist and instrumental attitude towards higher education. In the context of the UK, Naidoo and Jamieson (2005) hypothesise that a consumerist framework may promote passive and instrumental attitudes to learning and, in the long run, pose a threat to academic standards themselves.

In order to test out this proposition directly, the survey asked the following question:

- Q6 Imagine you have to choose between two modules (or units) in your course of study - which would you choose?**
- (a) an interesting course but hard to get good grades**
 - (b) a more boring course but where you think you can get good grades**

It could be argued that questions of this type are only imperfect indicators to student orientation. It could be that (a) is perceived as the more 'correct' or socially desirable answer which would lead to students choosing this alternative in preference to (b). In any case, it is almost axiomatic that expressions of a value statement do not necessarily translate over into commensurate behaviours. Despite these provisos, which have some force, it was still felt to be instructive to explore intercultural differences in orientation.

The results were tabulated and put into a 2 x 3 table and chi-squares computed as follows:

Country	Interesting but hard to get good marks	Boring but easy to get good marks	All
Czech Republic	75.2% (n=155)	24.8% (n=51)	206
UK	62.4% (n=58)	37.6% (n=35)	93
Spain	58.3% (n=56)	41.7% (n=40)	96
Totals	68.1% (n=269)	31.9% (n=126)	395
Chi-Square = 10.461, DF = 2, P-Value = 0.005			

Two particular features are revealed in this particular analysis. Firstly (and perhaps, surprisingly) the balance of choices was actually in the direction of choosing the more interesting module, even though this might have to be 'paid for' by actually achieving lower marks as a result. Secondly, the data reveals that whilst the majority of UK and Spanish students would choose 'interest' over 'grades', this is much more marked in the case of the Czech students. The chi-square analysis reveals that the differences in the preferences are significant at the 5% level. The data as a whole reveals grounds for cautious optimism that instrumentalism is perhaps not as marked as some commentators have hypothesised and predicted. An analysis by gender revealed no significant differences.

The survey also included the following question which was designed to test the thesis of increasing instrumentalism by asking students to rate three factors on a ten point scale as follows:

Q7 How important is it in your university on a scale of 1 Low to 10 High to ?

- **expand your intellectual skills**
- **obtain the grades necessary to obtaining a good job when you leave**
- **have a good source of friends**

The results revealed significant differences in the samples for each of these questions. The relevant results are summarised here:

Country	Expand your Intellectual skills	Obtain grades necessary to obtain good job	Have a good source of friends
Czech	7.22	6.99	7.18
UK	7.96	8.58	7.14
Spain	5.26	5.70	5.73
Average	6.92	7.06	6.82
ANOVA F scores and probabilities	46.76 (p=0.000)	44.74 (p=0.000)	14.12 (p=0.000)

When we examine the scores for each of the three questions, there is some slight evidence here of instrumentalism in that *Obtain the grades to obtain good job* was rated higher (by a fairly small margin) than *Expand your intellectual skills*. However, t-tests of each question against the other two failed to reveal that any of the differences achieved significance at the conventional 5% level. One would have to conclude here that these three factors are rated equal in importance to each other when considering the total sample.

However, when we come to compare the various country samples, some interesting patterns are revealed. The UK sample leads the other two countries in the ratings that are given to the *Obtain the grades to obtain good job* and *Expand your intellectual skills* questions but the differences between the Czech and UK samples are not particularly large. However, there is a fairly large and dramatic difference between these two samples and the Spanish sample which generally ranks about 2 points lower. The reasons for this finding must await further and more systematic investigation – one cannot discount the fact that the Spanish sample approached the whole exercise of rating on a 1-10 scale in a culturally different way. In any case, this difference generates ANOVA scores that point to significant differences in the country samples for these questions.

The questionnaire did not ask students to rate these factors against each other (although we can infer a ranking from the individual scores given to each question) It is therefore quite possible that students did not see these factors as being in opposition to each other but subscribed to values that gave as much weight to intrinsic factors (developing intellectual skills) as to extrinsic ones (obtaining a good job) Indeed, there is a powerful argument that implicitly students could appreciate that these two factors are intimately related. As is often the case in survey evidence of this kind, the implications are tantalising and any conclusions drawn must be tentative.

The questions were also analysed by gender with the following results

Gender	Expand your Intellectual skills	Obtain grades necessary to obtain good job	Have a good source of friends
Male	7.26	7.28	7.03
Female	6.47	6.76	6.54
	t=3.50 p=0.000	t=2.20 p=0.028	t=2.03 p=0.043

In each case, there was a significant statistical difference by gender, with males typically scaling question about 0.5 point higher than females. According to Bland (2003), the stereotype that females are more sociable than males is hard to sustain and this is certainly borne out by the answers to the *Have a good source of friends* question.

Use of multiple modes of electronic communication

The survey had elicited the amount of time that was typically spent in browsing the web in an earlier question (Q4), In this concluding part of the survey, information was sought on other modes of using the web in blogs and forums as well as use of the mobile phones for conventional talk and texting. No information was asked at this stage of other technologies such as PDAs, ipods, MP3 players, Blackberrys and the like in order to keep the required information succinct. The actual question asked was:

Q8 How many minutes do you spend each day (on average)

- reading and writing 'blogs' [web-logs]
- participating in a forum
- texting
- on your mobile phone

The results are summarised below:

Minutes per day per day:

Country	Reading and writing 'blogs' [web-logs]	Participating in a forum	Texting	On your mobile phone
Czech	10.28	21.30	32.01	36.74
UK	10.14	5.12	19.91	28.08
Spain	8.08	5.78	8.54	18.55
Average	9.712	13.70	23.45	30.27
ANOVA F scores and probabilities	F=0.43 p=0.650	F=12.60 p=0.000	F=15.10 p=0.000	F=5.40 p=0.006

These results will be analysed in turn.

Reading and writing blogs

Blogging appears to be much more extensive in the US than in Europe. One estimate has suggested that:

About 35 million workers — one in four people in the labor force — visit blogs and on average spend 3.5 hours, or 9%, of the work week engaged with them, according to *Advertising Age's* analysis. (Source: Heath, 2005)

This equates to some 42 minutes on a daily basis (assuming that USA employees in the survey work a 5 day week). The Czech and UK students spend about a quarter of this time but the USA data may provide a pointer to the future. The Spanish students were not as heavily engaged but the differences shown did not achieve any statistical significance.

Participating in a forum

It is evident that the Czech students had enthusiastically embraced the 'forum' culture whilst the data from the UK and Spanish were broadly equivalent. Some of the differences could be accounted for by the extent to which the contributing universities encourage the use of forums within their Virtual/Managed Learning Environments (VLEs, MLEs)

Texting

According to data reported by the National Literacy Trust, mobile phone users in Britain sent a record 25 billion text messages in 2004 (75 million texts per day) and this represents a doubling in Britain since 2001. The figure was projected to rise to 30 billion in 2005. (National Literacy Trust, 2006a, Franchises in the UK, 2006)

The average Briton spends 88 minutes a day on a fixed landline phone. A further 62 minutes is taken up on the mobile, 53 minutes emailing and 22 minutes texting (National Literacy Trust, 2006b)

The survey data gathered here indicated a UK result broadly consistent with this picture. However, there were large differences between the European samples with the Czech students spending approximately 50% more time per day texting compared with their English counterparts (32 minutes compared with nearly 20) The low Spanish figure is again a surprising feature with a figure less than half of the UK level.

Use of mobile phones

The gradient between the three societies evident in the use of texting is again evident when it comes to overall mobile phone use, although the variations are not as marked. What might appear to be surprising is that the UK students self-report an average figure of 28 minutes per day compared with the reported national figure of 62 minutes.

Gender differences in the minutes per day spent using ICT

Minutes per day per day:

Gender	Reading and writing 'blogs' [web-logs]	Participating in a forum	Texting	On your mobile phone
Male	9.3	14.6	26.1	31.3
Female	10.3	12.5	19.9	28.9
Average	9.71	13.7	23.5	30.3
	t=-0.52 p=0.60	t=0.61 p=0.54	t=1.80 p=0.07	t=0.54 p=0.59

Although there are some gender differences, none achieves statistical significance. However, the figure for *texting* indicates that male students in this sample spend more of their time texting than their female counterparts and the t-test (at p=0.07) almost achieves significance at the conventional 5% level.

All forms of electronic communication – combined

Minutes per day per day:

Country	All forms of electronic communication	Males	Females	t-test	Probability
Czech	214.9 (3.6 hours)	212 (n=155)	226 (n=37)	-0.46	0.65
UK	146.5 (2.4 hours)	139 (n=40)	153 (n=42)	-0.58	0.56
Spain	93.6 (1.6 hours)	78.0 (n=13)	99 (n=35)	-1.25	0.22
Average		190 (n=208)	160 (n=114)	1.84	0.07
ANOVA F scores and probabilities	F=16.96 P=0.000				

This concluding table brings together the total amount of time (minutes per day) that members of the sample spent in all forms of electronic communication. This includes data drawn from various parts of the survey i.e. amount of time spent browsing, reading emails, reading/writing blogs, participating in forums, texting and use of mobile phones

The results demonstrate significant differences by country. The Czech sample spend 50% more than their UK counterparts using all forms of communication (3.6 hours compared with 2.4 hours). Similarly, the UK students also spend 50% more time than the Spanish sample (2.4 hours compared with 1.6 hours)

The UK data indicates that students spend as much time in electronic communication of various forms as they do in formal class-contact time.

The figures are worth putting in the context of a recent national survey of communication patterns:

Conversation killer? - We spend 4 hours a day emailing, phoning or texting

The average Briton now spends a quarter of their waking hours either on the phone or using email research shows.

Individuals are spending 225 minutes a day (15 minutes short of four hours) on the phone or sending messages online. This is more than the time spent watching television. However, the art of conversation is dying because so much of this communication is done by text, email or talking to voice mails.

According to the research by the telecommunications division of British Gas, the average Briton spends 88 minutes a day on a fixed landline phone. A further 62 minutes is taken up on the mobile, 53 minutes emailing and 22 minutes texting.

Those with full-time jobs, a permanent partner and children will spend longer than the national average - a total of 250 minutes a day communicating.

Source: National Literacy Trust (2006b)

In order to make more exact comparisons with the UK national sample and the UK student sample, the figures that are directly comparable are extracted and presented in the following table:

Type	National Sample	UK Student sample
Email	53	19
Text	22	20
Mobile	62	28
Total	137	67

These data are especially interesting. The National Sample email figure will evidently be inflated by the fact that it is a large part of an individual's occupational life that they read and take action upon the emails they receive and so this discrepancy is not particularly surprising. As previously noted, the figure for *texting* is completely comparable. The figures for mobile phone usage might appear to be somewhat lower than would have been expected for a student group – possibly explained in part (but only in part) by the fact that the use of mobile phones is typically prohibited in universities within timetabled classes and workspaces such as lecture theatres and libraries. The raw figures indicate a level of usage which is only half that of the national sample.

Nonetheless, it does tend to put into context whether the younger generation are as 'leading edge' in their use of electronic modes of communication as has been hypothesised.

Pen-portraits of the three national samples

It is possible to provide a 'broad-brush' portrait of the characteristics of the national samples, as revealed by the raw statistical data. However, several important caveats are in order. Succinctly, these are:

- each university will not necessarily be typical of the society in which it is located
- students may well answer the questions with differing mind-sets, making comparisons difficult
- one enduring problem with all survey data of this type is that expressed attitudes (e.g. in response to a rating scale) may only be an imperfect indicator of actual behaviour patterns
- self-reported data may well be subject to wide margins of error as recall or 'guesstimates' of time spent on activities is evidently inexact.

Nonetheless, it is felt worthwhile to point to some broad conclusions, as revealed in the survey data.

Czech sample

The Czech sample seemed to be easily the most 'informationate' of the three national samples. They spent more time browsing the web, participating in forums and text-messaging. The amount of time spent using all electronic media was much in excess of the other two national samples. When preparing assignments, they used web-based materials to a greater extent than traditional materials. In their choice of modules, they were somewhat more inclined to choose on the basis of intrinsic interest rather than the possibility of attaining higher marks.

UK sample

The UK sample had more access to the internet in their domiciles than the other samples. The amount of time that they spent using electronic modes of communication was approximately two-thirds that of the Czech sample but about 50% more than the Spanish sample. Although they used the web much more extensively than other samples in order to prepare assignments, they devoted almost equal amounts of time to more traditional sources of material. There was some evidence that the UK students displayed a more instrumental orientation towards their studies by giving the highest rating to the question indicating the importance of obtaining good grades to secure future employment – however, they also rated the importance of enhancing intellectual skills nearly as highly.

Spanish sample

The Spanish sample were markedly less likely to have access to the internet – and their usage of all forms of electronic communication appeared markedly lower than the other two national samples. When preparing assignments, they typically used traditional rather than web-based sources. They were somewhat more inclined to choose courses on the basis of achieving better grades more easily rather than for intellectual stimulation. The ratings that they gave to the importance of factors such as developing intellectual skills, achieving good grades or thinking of the university as a source of friends were exceeded by the other two samples.

Gender differences

Gender differences were statistically significant in the following cases:

- Access (males more likely to have access to the internet at home)
- Browsing and email time (males spent longer browsing, females spent longer emailing)
- University expectations (males more likely to report that
 - universities expand intellectual skills,
 - importance of grades to secure good jobs,
 - universities are a source of friends)

However no significant gender differences were ascertained in the following areas:

- Amount of time spent preparing and researching assignments
- All forms of electronic communications combined (browsing, emails, blogging, participating in forums, text-messaging, mobile phone usage) although within this global category males are likely to browse and females to email)

Conclusions – Generation 'Y'

'Generation Y' is a term introduced by marketing analysts at Saatchi and Saatchi to identify the characteristics of the generation born between 1977-2003 and which, in the USA, number some 78 million. The defining characteristic of this generation is said to be technology and, in particular the digital media, which it is claimed, assist this generation both to play, work and communicate with peers, workmates and family. The availability and instantaneous nature of

digital communication offers unlimited access to knowledge and ideas, exploration and communication (Stark, 2000; Wikipedia, 2006)

However, a more recent British study (Chess Partnership, 2004) that has conducted research amongst students enrolled in hospitality courses in further education colleges and universities argues a somewhat different view. The authors argue that their research shows an adverse reaction to the ways of Generation X with a movement back towards traditional modes of communication.

Modern technology is not as important as it may appear.

The research shows an adverse reaction to the ways of Generation X with a

- ▶ movement back towards traditional modes of communication.
- ▶ 66% of Generation X have a mobile as their only phone
- ▶ 94% of Baby Boomers use a mobile as their secondary phone
- ▶ Yet 30% of Generation Y use their mobile as their only phone – a reaction to the immediacy sought by Generation X
- ▶ 14% of Generation Y use Text Messaging as a primary source of communication
- ▶ 56% use email as a primary source

Modern communication technology is not dictating the way that Generation Y communicate, whether on a professional or personal level. With a Generation that has grown up with mobile phones, text messaging and email they are more IT literate than previous generations. However, they are also showing signs of rejecting the informal, immediate communication approach of recent years.

Source: Chess Partnership, 2004

What light does our survey throw upon these emerging cultural patterns? Where we have managed to make comparisons of the survey data with national trends of the whole population, then it is not apparent that the students in our survey displayed markedly different characteristics. For example, text-messaging and mobile phone usage appeared to be lower (not higher) than the whole population characteristics. This is not to deny the importance of newly emerging cultural patterns – as we have seen, present generations of students now devote approximately one half of their research and preparation time utilising internet-derived sources. But the findings revealed by this survey do not immediately suggest a pattern of 'Generation Y' as defined by the American marketing analysts. There is, however, a greater possibility of congruence with the British formulation of 'Generation Y'

Technical note

A questionnaire was distributed to business/social science students in three universities (one in the Czech Republic, one in southern England, one in northern Spain). The data was statistically analysed using MINITAB version 12. ANOVAs deployed for the country analyses were one-way ANOVA with 'Country' as the factor. The Gender analyses were conducted using 2-Sample t with subscripts in 'Gender' Occasional use was made of the tables..cross-tabulation function.

The following files are available on a website for consultation and download for interested researchers:

Website <http://ecel2006.visit.ws/survey>

- esurvey.mpj MINITAB project file
- esurvey.txt exported test version of the above
- results_1.doc raw results file
- survey2.doc introductory letter, copy of questionnaire

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