BRIEF SUMMARY OF EVALUATION PILOTS (ELLLUMINATE)

SEMESTER 2, 2010

An analysis and results of Elluminate S2, 2010 survey

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The second iteration of the sub-layer 1 evaluative instrument included several additional questions for subscales 4 and 5 and was aimed at providing detailed answers to the question regarding the nature of errors experienced by users (see Refinement of the TELT survey instrument doc. for more details on the changes made to the original survey). Elluminate S2, 2010 pilot had 30 complete responses.

Demographics

The demographics of the S2 pilot: 4 staff members (13.3% of the responses) and 26 students completed this survey. Since the number of the staff participating in this survey was not particularly large, we did not include any additional comparisons between the staff and students.

Regarding the users major, there were 29 participants from ASB (Australian School of Business) and 1 participant from the School of Engineering. Therefore, no faculties’ comparisons were conducted for a current sample.

Error experience and related questionnaire items

About a half of participants (53%) experienced errors during the use of application. Our previous evaluative activities with educational technology applications, such as Moodle, demonstrated that an error experience influences users’ perception of the technology to a very large degree (see TELT educational technologies pilots: brief summary of findings doc.). In particular, users’ perception of the objective features of the system, i.e. a Usability subscale, was significantly lower if they have experienced errors, and this significant difference was affecting all the groups of learners. More than that, the division by groups depending on learners’ previous technology experience and personality features was not as much affecting the final results as an error experience. This situation is somewhat contra-intuitive since the Usability subscale was designed to be an objective instrument to measure purely technological (not emotional) aspects of the application usage. However, there were no data in S1 survey clarifying the nature of errors. If the errors had a technical nature (i.e. inability to upload a file, a link that does not work), it would be quite logical that the error experience influences learners’ perceptions of an overall technology. Thus, we have included a clarification in S2 instrument.

When learners were indicating they have experienced errors while using the system they had several choices helping them describe the nature of errors. In case of Elluminate 75% of errors experienced by users were of a technical nature and the other 25% were implementation errors, Fig.1.

An overall comparison of error rates for Elluminate and Moodle pilot participants (see Brief summary of evaluation pilots (Moodle) doc. for error rates in Moodle pilot) shows that the implementation errors were occurring more often in case of a conferencing software, such as Elluminate than in a case of LMS, such as Moodle. On the other hand, users of LMS have experienced more technical errors (82%) in comparison with the Web conferencing software users (75%). Thus, similar to the results from the previous semester, users were considering the system having poor technological features / unusable if they experienced technical errors themselves.
One participant also has included course design errors in addition to technical errors as a primary choice (one of his/her qualitative comments stated that this person works in IT consulting, thus the choice of two types of errors was not a misunderstanding). Therefore, we have included course design errors in the legend but it is not visible on the chart itself.

Previous analysis of the S1 Moodle survey items also included one item that was considered to be so heavily dependent on users’ error experience that the further analysis of this item was proposed to be carried out individually outside of the five major dimensions analysis (see Refinement of the TELT survey instrument doc.). This item was related to the use of documentation and help functions in the application. The current analysis demonstrated that the main effect of the error experience was indeed significantly related to the use of documentation and help functions by survey participants, $F(1, 21) = 9.99, p = .005$. Participants who have experienced errors were more inclined to use help (group mean = 5.5) in comparison with participants who did not experience any errors (group mean = 3.64) and significant difference did not depend on participants previous technology exposure. There were no significant effects of a group membership, $F(1, 21) = .008, ns$, or a significant interaction, $F(1, 21) = 1.38, ns$. Thus, we can conclude that prior technological experience did not influence learners differentially in regard to their usage of help functions, but their error experience did. These results could also be explained by the fact that only average and techy learners groups were part of this analysis (see General Findings section).

**SUMMARY OF ERROR EXPERIENCE**

- While Web conferencing software requires an additional attention of an instructional designer in regard to its implementation, technical errors play the major role in participants’ decisions to use help and supporting documentation.
- Also, technical errors are repeatedly shown to influence the participants’ usability ratings for LMS and Web conferencing systems. High percentage of technical errors make users believe the system is unusable and indirectly reflects on all the subsequent instructional designers and developers efforts.
GENERAL FINDINGS (DESCRIPTIVES)

In the analysis of the Elluminate survey results we have applied the same method of dividing participants on more or less technologically proficient groups as we have employed with LMS Moodle surveys in Semesters 1 and 2, 2010.

The original Moodle survey S1, 2010 data served as a normative data for this division. S1 Moodle sample is considered to be truly representative of the students' population (Dandapani, 2004) at UNSW, and S1 answers serve as a normative model in relation to S2 answers for both Moodle and Elluminate results. Thus, the participants whose answers were within one standard deviation from the S1 Moodle survey mean in terms of technology proficiency were considered average technology proficient group. Participants whose answers were above one standard deviation in terms of technology proficiency were considered techy learners group. And participants whose answers were below minus one (-1) standard deviation in terms of technology proficiency were considered not-techy learners group. It is interesting to note that only two (2) learners from the current sample were belonging to not-techy learners group. Our speculations regarding such a small number of not-techy participants would be first related to the major of the survey participants (Taxation and Commerce) and then, to their School (School of Business). Regarding Taxation and Commerce as a major, multiple taxation software programs existed on the market as early as 1990s, were developed for a DOS environment and gained acceptance by the accountant professionals at the time when the Internet itself was only used by a narrow circle of military organizations. The usage of accounting programs required a good level of technical proficiency starting from the early 1990s, so the advanced technological proficiency might be considered to be a part of professional requirements. In this context, the small percentage of not-techy learners is not surprising. Overall, in S2 Elluminate survey, we had a large group of techy learners (40% of the total) and relatively small number of not-techy participants (2 participants - 6.7% of the total) which inevitably influenced the total results by subscale. Thus, not-techy participants were excluded from a general analysis as a group and all statistical operations were performed only with average learners and techy learners groups. Twenty-eight (28) responses were accepted for a further analysis, see Table 1.

Table 1: Means and standard deviations for subscales by participants groups (N = 28)

<table>
<thead>
<tr>
<th>Scale</th>
<th>Group means (standard deviations)</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Group 2</td>
<td>Group 3</td>
<td>Total</td>
<td></td>
</tr>
<tr>
<td>1. Usability evaluation</td>
<td>4.44(1.02)</td>
<td>4.68(1.77)</td>
<td>4.54(1.37)</td>
<td></td>
</tr>
<tr>
<td>2. Feelings toward an application</td>
<td>4.43(.83)</td>
<td>4.77(1.47)</td>
<td>4.58(1.14)</td>
<td></td>
</tr>
<tr>
<td>3. Resistance to implied authorities in relation to one's teaching and learning*</td>
<td>4.42(.83)</td>
<td>4.81(1.03)</td>
<td>4.59(.93)</td>
<td></td>
</tr>
<tr>
<td>4. Preconceived notions about eLearning</td>
<td>4.39(.89)</td>
<td>4.86(1.07)</td>
<td>4.6(.98)</td>
<td></td>
</tr>
<tr>
<td>5. Flexibility of application in relation to one's teaching and learning</td>
<td>4.68(.80)</td>
<td>5.44(.59)</td>
<td>5.01(.80)</td>
<td></td>
</tr>
</tbody>
</table>

* reverse scale

Since a Web conferencing software survey data was only collected for S2, 2010, it was not possible to present any subscale comparisons for Elluminate. However, comparing current Elluminate results with Moodle results we could notice the following trends in group-by-group comparisons:
Elluminate survey participants seemed to be more skeptical about usability, their emotions in regard to the Web conferencing software and their preconceived notions about eLearning than Moodle survey participants;

Elluminate survey participants were also less resistant to implied authorities in regard to their own teaching and learning than Moodle survey participants;

Flexibility ratings were somewhat high for both Elluminate and Moodle taking into consideration the survey scale mean (4 as a statistical mean with 4.5 often being a real mean in terms of educational measurement).

USABILITY EVALUATION

The general trend observed with the usability subscale (subscale 1) suggests that participants’ error experience was a significant factor influencing their usability ratings, $F(1, 24) = 7.92, p = .01$. As it was discussed above, participants often perceived an application as unusable if they have experienced errors. This was especially evident with techy learners groups and less evident with average learners. To explain the statement, we have observed a statistically significant interaction between average and techy learners perceptions of the usability based on their error experiences, $F(1, 24) = 4.9, p < .05$. When techy learners were experiencing errors they were more critical than average learners, yet in the error free environment they were more enthusiastic about the usability of the Web conferencing software, Fig.2.

Figure 2: Perceptions of Elluminate usability by learners’ groups and learners’ error experience

Further analysis of these findings showed the error experience was especially harmful in regard to users’ answers to the most of the usability subscale items. Answers to seven of nine subscale items (see Refinement of the TELT survey instrument doc. for a further description of the items) were affected by learners’ error experience. These seven items included questions about the way information and resources are organized within the application, the clarity of search processes, the performance speed, the integration of the information and resources with one’s
teaching and learning approach, the other learners’ perception of the application, ratings the application in comparison with the other applications and the major issues with the use of the application. When learners experienced errors their ratings of the above features were significantly lower than when they did not encounter any errors (p-s ranging from .003 to .07). Thus, learners’ error experience has influenced almost all the aspects of usability ratings.

**FEELINGS TOWARD AN APPLICATION**

The general trend observed with the feelings toward an application subscale (subscale 2) indicate that participants error experience also played an important role in their emotions associated with a Web conferencing software, $F(1, 24) = 5.48, p < .05$. Participants that have not had an error experience had better feelings toward the application, Fig. 3

**Figure 3: Feelings about Elluminate by learners’ groups and learners’ error experience**

![Estimated Marginal Means of factor2](image)

However, the group membership was not a significant factor in participants feelings about the application, $F(1, 24) = .17, ns$.

Further analysis of error experience showed the error experience influenced only two of four subscale items (see Refinement of the TELT survey instrument doc. for a further description of the items). These two items included questions about feeling apprehensive about using the application ($p < .05$) and the integration of the application features with one’s teaching and learning style ($p = .058$).

**RESISTANCE TO IMPLIED AUTHORITIES**

The general trend observed with the resistance to implied authorities (subscale 3) did not show any main effects of the error experience or the group membership. The following statistical values were observed for error experience - $F(1, 24) = .90, ns$, and groups’ differences - $F(1, 24) = 1.46, ns$. However, we could notice a marginally significant interaction of the error experience and the group membership, $F(1, 24) = 2.98, p = .099$. It seemed experiencing errors was
beneficial for techy learners’ resistance, and they were not too critical, or not analysing their attitudes to implied authorities otherwise. At the same time experiencing errors was lowering resistance of the average learners. Since average learners don’t have as much technical knowledge as techy learners, experiencing errors was possibly contributing to their doubts regarding their own technical proficiency and lowering their resistance.

No further analysis was conducted for individual items level since main effects of error experience or the group membership were not significant.

PRECONCEIVED NOTIONS ABOUT ELEARNING

The general trend observed with the preconceived notions about eLearning subscale (subscale 4) indicates that average learners had somewhat lower ratings of the preconceived notions about eLearning than techy learners. However, neither participants’ error experience, nor the groups’ difference were significant for this subscale. The following statistical values were observed for error experience - $F(1, 24) = .91, ns$, and groups’ differences - $F(1, 24) = .41, ns$. A possible explanation for these findings was that the sample size of 28 participants might not be big enough to find fine-grained differences between the conditions but acceptable for finding coarse-grained differences.

Also, no further analysis was conducted for individual items level since main effects of error experience or the group membership were not significant.

FLEXIBILITY OF THE APPLICATION

The general trend observed for the flexibility of the application in relation to one’s teaching and learning subscale (subscale 5) indicate that participants error experience was not a significant factor in their opinions about the flexibility of the application, $F(1, 24) = 1.01, ns$. However, the

Figure 4: Perceptions of Elluminate flexibility by learners’ groups and learners’ error experience
groups’ difference existed, and the techy learners group had significantly higher opinion about the flexibility than an average learners group, $F(1, 24) = 5.16$, $p < .05$, see Fig. 4.

Further analysis of these findings showed that only one of the three subscale items (see Refinement of the TELT survey instrument doc. for a further description of the items) was actually illustrating groups’ difference. An item showing how much learners were considering themselves to be informed about the integration of the application with their teaching and learning had a significantly different values for techy and the average learners with techy learners considering themselves significantly better informed ($p = .028$).

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**SUMMARY OF FINDINGS**

While no longitudinal data is available for Eluminate, and, as a result, no comparisons could be made between different semesters, we observed several common trends within the existing semester data. These trends are described below:

- Error experience had a significant influence on learners’ perceptions of the usability and feelings toward the application for the Web conferencing software. This was true for the most of individual items on both of these subscales when individual items analysis was performed;

- Techy learners were consistently higher in their ratings of the flexibility of the application, its usability and had higher preconceived notions about eLearning. However, these higher ratings were not always significantly higher than the average learners’ group ratings.

These original findings are meant to serve a base for further exploration of the Web conferencing software and possible comparisons of several types of the software planned for 2011.
REFERENCES: