Computers in Human Behavior 28 (2012) 308–317

Contents lists available at SciVerse ScienceDirect

Computers in Human Behavior

journal homepage: www.elsevier.com/locate/comphumbeh

An observational study of undergraduate students' adoption of (mobile) note-taking software

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ARTICLE INFO

Article history:
Available online 22 October 2011

Keywords:
Mobile learning
m-Learning
Cloud computing
Note taking
Portfolio
Idea generation

ABSTRACT

Mobile learning is increasing in popularity, but not all university students have mobile devices to support it. Our study investigated cross-platform software that has the potential to allow education practitioners to provide mobile support to their students' learning, while offering similar functionality to non-mobile users via more traditional computing platforms. Undergraduate students were trained in the use of multi-platform cloud-based note-taking software (Evernote), and used the software in independent study for 8 weeks. Data show adoption for a range of functions, particularly gathering and managing information, organisation and planning, and the recording of ideas. Multimedia functions were also adopted innovatively by some students. Use for reflection was rare. Non-adopters were in a minority, giving low utility appraisals and difficulty in changing habits as reasons. Subjective evaluations and recommendations showed that a majority of students felt positive about the software and found it quick and easy to use. Mobile and non-mobile users only differed on the number of locations in which they used the software, and the proportion of notes classified as ideas, both being higher in mobile users. The data provide decision support for education practitioners who wish to provide mobile learning to their students alongside traditional platforms.

1. Introduction

1.1. Background

Ownership of mobile communication and information technology is increasing rapidly, and mobile technology is becoming ever more sophisticated. Many people use mobile devices, such as smartphones, to support their personal and professional functioning. Mobile devices can also be valuable in higher education. Evidence suggests that mobile devices can influence how information is gathered and used in education (Johnson, Levine, Smith, & Stone, 2010; Martin et al., 2011). They can also facilitate time management, access to content, communication (see Corlett, Sharples, Bull, & Chan, 2005; Motiwalla, 2007) collaboration and reflection-in-action (Aubusson, Schuck, & Burden, 2009; Hsieh, Jang, Hwang, & Chen, 2011) and enhance engagement with learning both at traditional study locations and in external practice (Chao & Chen, 2009; Martin et al., 2011). Given their increasing computational power, and their potential ubiquitous use, mobile technologies are predicted to play an increasing role in education (Johnson et al., 2010; Martin et al., 2011).

In practice, embedding mobile technology into learning and teaching settings is not necessarily straightforward. Not all students own mobile devices that support mobile learning (Smith & Caruso, 2010). While it is possible to circumvent this problem during research projects, by lending students equipment (e.g. Corlett et al., 2005; Sandberg, Maris, & de Geus, 2011), such a solution cannot always be applied in actual education settings, particularly due to cost restrictions (Fallon, 2002). Thus, the lessons from such trials do not always translate readily into practice. Moreover, mobile learning is not universally accepted, with some users displaying a lack of engagement or a dislike (Liu, Li, & Carlsson, 2010; Smith & Caruso, 2010). Further, some trials have tested the use of tailor-made mobile applications (de-Marcos et al., 2010; Sandberg et al., 2011), but not all institutions have the funds to commission tailor-made applications for different learning settings (Fallon, 2002). Taken together, these three constraints make it desirable to use technology which enables mobile learning on hardware that students already own, but which also caters for learners who prefer traditional computing platforms, and which utilises relatively generic software which can be tailored to different learning tasks. Therefore, our aim was to explore a way for education practitioners to be able to offer mobile learning to students, alongside learning

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doi:10.1016/j.chb.2011.09.014

in other forms, by using multi-purpose software that ran on multiple platforms.

In our study we aimed to optimise the generalizability of our findings, by using generic independent study behaviour as a test-bed. Independent study behaviour (also referred to as private study, guided study, or directed study) includes reading, note-taking, information seeking, assessment writing, planning, organising, problem solving and reflection. On many higher education courses, independent study accounts for an equal or larger proportion of the students' time than time spent in class (Bekhradnia, 2009), and we therefore tapped into a common behaviour. If evidence emerged that students adopt the software for a range of study behaviours by free choice, it would provide strong evidence that it would be suitable for adoption in more structured settings (e.g. within a course). This is in contrast to a potential alternative test model in which students would use software within a course, or for a specific purpose. Findings from such a potential study would not necessarily generalise beyond the context in which the software was used. Moreover, it could be difficult to know whether observed use was due to a perceived "compulsion", or actual preference. A further advantage of using independent study as a test-bed is that we were able to study software use across a range of disciplines, further maximising the generalizability of the findings.

1.2. Note-taking software

Based on the criteria outlined above we searched for note-taking software that was available on as many platforms as possible, could support independent study, and that could be used for a multitude of purposes. After surveying note-taking packages that had mobile and non-mobile versions, we identified one package as having the greatest functionality, highest number of media formats, and greatest availability via multiple platforms, alongside free availability for individual users. This software was Evernote (Evernote.com a).

Evernote is a cloud-based note taking system, which allows for the storage and retrieval of text notes, voice notes, photo notes, and ink notes. It also enables web clipping, i.e. the capture of complete or partial web pages as notes by a single mouse click. It also allows users to create "to-do" items, which can be checked off as finished when completed. It has the function to search for various features, and includes character recognition (finding, for example, text in images). Evernote runs via desktop clients on Windows-based PCs and Macintosh computers, and as apps on a range of smart phones (iPhone, some BlackBerry models, Android, Palm Pre, Palm Pixi, Windows Mobile, some Nokia models), and via other mobile devices, namely iPad and iPod Touch. It also runs via a web interface, with a version optimised for larger PC screens, and one for smaller mobile screens. It operates free and premium services, with premium users, at the time of our trial, being able to store a wider range of file formats, and having a larger monthly storage allocation. Note that the file format restriction on non-premium users has since been lifted. In June 2011, Evernote had 10,026,431 users, of which 4.2% were premium users (Libin, 2011). Evernote can be used by students on any suitable devices that they might own or have access to.

1.3. Background mobile ownership and laptop data

To establish viability of offering the software to students using their own devices at our institution, we gathered ownership data via a larger induction questionnaire given out to all newly arriving first-year students in September 2010 ($N = 1539$). This revealed that at intake, 99.7% of the sample owned a mobile phone, 78% owned a mobile phone with internet facilities, and 47.6% owned a smart phone, mostly of types that supported our chosen software. In addition, 83.1% owned a laptop computer, 7.5% a netbook, and 14.1% an iPod Touch. Ownership of an iPad was rare at the time of polling, at 0.7%. Thus, a relatively high proportion of the students in the sample had access to mobile devices that enabled them to use the software in its mobile version, ensuring viability of our study and contributing to the utility of its findings. Our figures are similar to those of Smith and Caruso (2010), which suggests that our sample may be representative of similar populations.

1.4. Research aims and research questions

Our primary research question was whether students, following appropriate training, would adopt electronic note-taking in their independent study behaviour, and if so for what purposes. We aimed to record actual objective use during an observation period of 8 weeks, alongside subjective evaluations of the software, and illustrations and reports of usage. We were particularly interested in evidence of adoption for academic purposes.

An important focus of our research was to compare mobile with non-mobile users. Because ownership of internet-enabled mobile devices is not universal, it is important to establish whether the software in question is adopted as readily and perceived in the same way by non-mobile users as it is by mobile users. If not, then practitioners may feel hesitant to introduce it, because it might disadvantage those who do not own mobile devices.

A further, subsidiary, aim of our study was to explore to what extent electronic note-taking software was adopted to support reflection or reflection-in-action (Aubusson et al. 2009; Boud, Keogh, & Walker, 1985). We chose to examine this separately because reflection is an increasingly important part of the higher education experience. Further, our institution offers a range of vocational courses (e.g. teaching, nursing, midwifery, etc.), in which students produce assessed reflective writing in which they integrate experiences gained during professional placements with theory, while reflection is also used in other courses to develop subject-related skills (e.g. dance, drama, sport science, etc.). Reflection is used in a variety of further contexts including medical training (e.g. Wald, Davis, Reis, Monroe, & Borkan, 2009) and law (e.g. Hinett, 2002). We believed that the software had the potential to support this function due to its ubiquitous availability, and we aimed to observe students' use of the software for this specific function. Finally, as a by-product of our main research questions, our research also tested student use of cloud computing, forecast to play an increasing role in the future (e.g. Hammond, Hawtin, Gillam, & Oppenheim, 2010).

The objective of our study was to provide "decision support" (Hammond et al., 2010) to practitioners who may consider adopting cloud-based cross-platform note-taking software in their education programmes for a range of functions, and for whom empirical data would facilitate their decision-making process.

2. Observational study: methods and protocols

2.1. Participants

We recruited an initial cohort of 61 undergraduate students from the University of Chester. Twenty (33%) were male, and 41 (67%) female, representative of the gender balance at the institution. All participants were white/Caucasian. This is in the context of a predominance of white/Caucasian students at our institution (95% based on April 2009 data, excluding "unknown"). This percentage is somewhat higher than the 87.9% white/Caucasian people in population estimates in England and Wales for the same year (Office for National Statistics, 2011, Table 4). Thirty-three

(54%) had a suitable mobile device, while 28 (46%) did not, and only used the web and/or PC client. Note that mobile users were also free to use the Web or PC version in addition to their mobile device. Almost all students were novice users of the software, while four had used the software before the start of the study, of which two had used it to try out the software to help them decide whether to participate.

The students were from a range of courses, representative of the courses offered at the institution (Natural and Social Sciences, Humanities; as single or combined courses). The students were from all years of study: first: 39%; second: 18%; third 39%; fourth 2% (note few courses take 4 years; most involve placements in business or abroad in third year). A 2% did not declare a year of study. The mean age was 21.7 years, (minimum 18, maximum 49, SD 6.03 years). 38% reported that reflection was compulsory (i.e. an explicitly assessed or evaluated requirement) on their course. Six participants discontinued, leaving our final sample at 55. Of those discontinuing, three were Web/PC users (leaving 25 in the final sample, 10 male, 15 female), and three had mobile devices (leaving 30 in the final sample, 7 male and 23 female). Note that the gender composition did not differ significantly as a function of group, $X^2 = 1.774$, df = 1, $p > 0.05$. Representation from mobile users was significantly uneven when comparing the earliest 2 years of study (21 mobile, 10 Web/PC) to the last 2 years (8 mobile, 15 Web/PC), $X^2 = 5.77$, df = 1, $p < 0.05$.

As a token reimbursement for the time spent in training and evaluation sessions (a total of approximately 3 h), participants were paid £25 upon completion of the final evaluation session. We reasoned that offering payment would aid recruitment and reduce attrition. We also felt it would enhance the representativeness of our sample by reducing the risk of our sample being restricted to the most motivated students. Upon discontinuation, pro-rata partial payments were offered, based on attendance at training sessions. It was made clear to participants that their payment was not contingent upon the quantity or type of use of the software and it was stressed that participants should use it as much or as little as they liked for whatever purpose they chose. All information provided was anonymised. It is important to note that it was made clear to students that the content of their notes would remain private to them alone, with the exception of one note of their choice, if they chose to share one note with the project team.

The work was approved by the University of Chester Learning and Teaching Institute's Research Ethics Committee and complied with the University of Chester Research Governance Policy and with British Psychological Society Ethical Guidelines.

2.2. Training

2.2.1. Protocol of first training session

Starting mid-October 2010, students were trained in small groups (5–15 participants) in a teaching lab which had a data projector and screen for the trainer. Each student had an individual networked PC with the standard University Windows-based image, which included a "clip to Evernote" javascript "bookmarklet" on its two browsers (see Evernote.com, 2011b). A few students were trained in individual sessions due to timetabling constraints.

Students were shown an overview clip from the Evernote website (Evernote.com, 2011c). Students were given a brief outline of Evernote's functions, and were invited to sign up for an account. While accounts were activated, students watched a video on student use of Evernote (Evernote.com, 2011d). Students were shown web clipping using the web interface. They were taught how use tags, how to create "notebooks" (equivalent to folders or directories), how to use the search function, how to export notes, and how to email notes in and out of Evernote. They were also shown how to create to-do lists, and how to check items on these lists as finished. Students were introduced to the desktop client and its web clipper add-in. The concept of synchronisation to the cloud was explained, and its practice demonstrated.

For the benefit of those with mobile devices, students were informed about the availability of Evernote apps, and we checked whether they knew how to download apps for their devices. Students were shown how to take a snapshot and a voice note using the mobile phone app, and how to synchronise this. They were also shown the mobile web interface of Evernote, in case there were participants whose phones were not compatible with any version of the apps.

Ideas for use were suggested. These included reflection, recording ideas, information gathering (e.g. for essays or assignments), creating to-do lists to track work or to manage complex projects, keeping course information, and recording visual information using snapshots (e.g. whiteboards, archaeological digs, art work, experimental set-ups, etc.).

Students were issued with a handout that summarised technical advice and ideas for use. They were given access to a local dedicated website with help files and with links to the Evernote website (Evernote.com, 2011a). They were offered ongoing support via email or phone, via author CB, though there was no demand for this. At the end of the session, students were given time to explore Evernote, while members of the project team answered any queries. The initial training took approximately 70–90 min.

2.2.2. Evaluation of first training session

When providing training, it is important to check its adequacy, as background against which to evaluate subsequent usage data. We therefore checked whether students had found the training clear, the technical aspects helpful, and whether they had gained ideas for use. The responses are presented in Table 1.

We also asked students how confident they felt after training to start using the system, choosing from response options as follows: 66% felt "confident to use it right now"; 33% felt "confident [they would] be able to use it with some more exploration", and 2% indicated that they did "not feel confident on some aspects, and [would] make use of help" (note: total is above 100% due to rounding). We asked whether students had any additional training needs; 98% said no, 2% said yes. Thus, training was considered to be perceived as adequate.

2.2.3. Follow-up training

Follow-up training was conducted in small groups, approximately a fortnight after the initial training, with exact timing subject to availability. Students commented briefly on initial usage

Table 1
Percentage of participants choosing response options indicated following training session. Note, totals may not add to 100% due to rounding.

Clarity of training		Technical aspects of training		Gained ideas for use	
Very clear	62%	Very helpful	57%	Strongly agree	51%
Clear	36%	Helpful	39%	Agree	44%
Mixed	2%	Mixed	3%	Neutral	3%
Unclear	0%	Unhelpful	0%	Disagree	2%
Very unclear	0%	Very unhelpful	0%	Strongly disagree	0%

and any technical problems that they had experienced, and advice was offered to those individuals who experienced technical problems. At the second session, we also collected data using two questionnaires: The Need for Cognition scale (Cacioppo & Petty, 1982), and the Learning Autonomy Scale (Macaskill & Taylor, 2010). We wanted to examine whether a drive to cognise and having autonomous learner characteristics determined usage or other data. In the event, these two measures only correlated positively with each other, $r = 0.369$, $N = 55$, $p < 0.01$, but not with any other measures, nor did they differ as a function of user group, so we will not discuss these further (cf. Liaw, Hatala, & Huang, 2010, who found learner autonomy to be a predictor of mobile learning use).

2.3. Evaluation session protocol

Eight weeks after the first training session, participants returned for a final evaluation. The interval between initial training and evaluation (and thereby the duration of our observation period) varied somewhat, due to timetabling constraints on scheduling the evaluation session. The average duration of use was 56 days (SD = 16 days). In the evaluation session, participants met individually with an interviewer in a quiet room. Participants accessed their Evernote account via the web interface, but, to allow for the privacy of the participants' notes, the interviewer did not see the contents of the notes.

The interviewer recorded a number of objective measures of usage, based on the participants' user accounts, and recorded further functional uses of the software. Participants completed subjective ratings and an overall user recommendation. Participants were asked to share one sample note that represented their typical or best use, and, finally, a summary opinion was recorded. We indicated that this should be two or three sentences in length. The summary opinions were spoken, recorded and then transcribed for 44 participants, while 11 participants preferred the alternative option of providing written summary opinions. On average, summary opinions were 92 words long. For the sake of brevity, we will only report content from the summary statements where this complements the main findings.

3. Results and discussion

3.1. Usage data

3.1.1. Total usage

The number of notes and notebooks made during the project was recorded by using the count function on the directory panel of Evernote's web interface (see Table 2, and see Fig. 1 for distributions). Although mobile users had more notes and more notebooks, an independent-samples t-test showed that their mean numbers did not differ significantly from the number generated by Web/PC users, $t(53) = -1.20$, $p > 0.05$ for number of notes; $t(53) = -0.36$, $p > 0.05$ for number of notebooks. Mobile devices, despite making Evernote more readily available, did not significantly increase use. However, note that large variability may have masked a possible underlying trend. Note, further, that it is, in principle, possible that participants erased notes. Unfortunately we did not ask participants about this directly, but nobody offered information to this effect and this therefore appears unlikely.

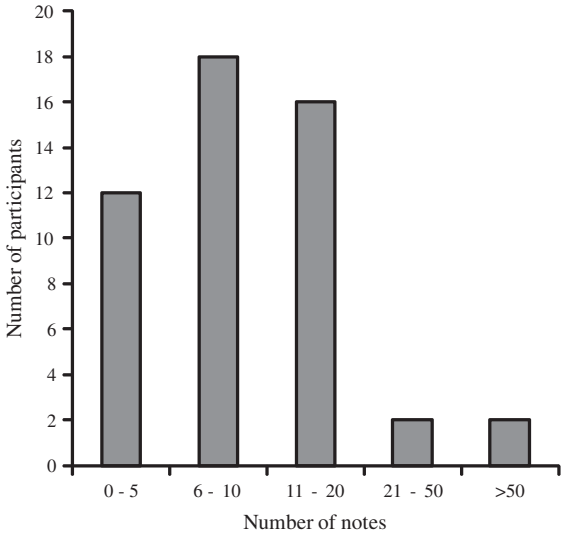

Fig. 1. Histogram indicating the number notes taken by the number of participants during the observation period.

Comparing our overall usage findings to other m-learning and e-learning usage studies, we note that Liu et al. (2010) found that of students surveyed in their study on their use of smart phones for "advanced mobile services" found that 35.4% never used those services, 34% used them 1–5 times per week, 21%; used them 5–10 times per week and 9.6%, more than 10 times per week, which is comparable to our findings. Further, with respect to more general e-learning, in a survey at King's College London (2011), a sample of 271 undergraduate students accessed their institutional Virtual Learning Environment as follows: most days: 36%; once a week: 24% ; several times a month: 8%; once a month: 5%; less than once a month: 7%; never: 10%; (note: not answered: 10%). Data varied for specific functions. For example course handouts and powerpoint slides were frequently accessed by a relatively high proportion of students, while web links to relevant sites and announcements from tutors had a majority of "once per week" responses, while some other functions were never used by a large majority of students. See also Smith and Caruso (2010) for comparable data.

3.1.2. Type of usage

3.1.2.1. Actual observed use by note type. Participants were asked to indicate how many of their notes fell into a range of usage categories pre-specified in Evernote, namely in the "contains" and "source" functions of the directory panel of the web interface (as listed in Table 3). We chose to adopt these categories because their dependable counting functions optimised the reliability of the data. We converted the raw numbers to percentages of the total number of notes (Table 3). We analysed usage patterns for differences between the mobile and Web/PC users, but found these non-significant, except, unsurprisingly, the percentage of notes made from a mobile device, which was 27% in mobile users, 0%

Table 2
Overall usage statistics for all users, and separated by user group.

	Total Mean (SD)	Total Minimum–maximum	Web/PC users ($N = 25$) Mean (SD)	Mobile users ($N = 30$) Mean (SD)
Number of notes	13.6 (18)	0–123	10.4 (9.9)	16.2 (22.5)
Number of notebooks	1.8 (1.6)	0–7	1.7 (1.6)	1.8 (1.6)

Table 3
Type of use, obtained using Evernote count algorithm, converted to percentage of total notes that fall into the relevant category. Note that categories overlap, making totals greater than 100%.

	Total		Web/PC		Mobile	
	Mean	SD	Mean	SD	Mean	SD
Notes clipped from web page	47.2	30.9	50.8	33.5	44.4	28.9
Notes containing images	32.1	28.2	30.2	28.6	33.7	28.3
Notes from mobile	15.1	26.8	0.0	0.0	27.1	31.3
Notes containing to-do items	12.7	20.8	10.6	20.6	14.3	21.2
Notes containing unfinished to-do items	11.0	19.3	9.0	20.9	12.6	18.2
Notes containing pdf	5.7	16.1	8.7	22.6	3.2	7.3
Notes containing finished to-do items	4.9	8.8	3.9	9.1	5.7	8.7
Notes clipped from email	1.9	13.6	4.2	20.4	0.0	0.0
Audio notes	1.5	6.6	0.0	0.0	2.8	8.7
Ink notes	0.6	4.5	0.0	0.0	1.1	6.1
Notes containing attachments	0.4	2.7	0.8	4.1	0.0	0.1
Notes emailed to Evernote	0.2	1.2	0.0	0.0	0.4	1.6
Notes from another application	0.0	0.0	0.0	0.0	0.0	0.0

Table 4
User-categorised and user-counted functional use, converted into percentage of total notes. Note that categories could overlap and that categorisation was not exhaustive.

	Total		Web/PC		Mobile	
	Mean	SD	Mean	SD	Mean	SD
Study notes	47.5	33.8	38.3	34.9	54.8	31.6
Ideas	16.0	19.8	8.2	12.0	22.3	22.7
Organising notes	10.3	17.7	8.3	20.0	11.9	15.8
Reflections	4.0	11.6	3.6	7.2	4.3	14.3

in Web/PC users. Note that this means that those who owned mobile devices also used the software on other platforms. In addition, we asked, if participants used images, whether they contained any photos that they had taken themselves, to which 21% of the 37 participants who had images replied affirmatively. Of those with audio notes, 75% of the four stated that these contained recordings that they had made with their mobile device. In relation to the relative rarity of audio notes, a few participants told us that they felt inhibited about using voice notes, because they felt uncomfortable dictating notes into their phones in the presence of other people. Thus, social inhibition may prevent adoption of a potentially useful function (see Laughlin & Wong-McCarthy, 1975).

3.1.2.2. Functional use. In addition, we asked participants to inspect their notes, and count the number of notes that fell into each of the following categories: study notes, ideas, organising notes and reflections. Again, we converted the numbers into percentages of the total number of notes (see Table 4). There was one significant difference between user groups, namely in the percentage of notes that were categorised as "ideas". This was higher in mobile users (22%) than in web/PC users (8%), $t(45.78) = -2.93$, $p < 0.005$, with Levene correction due to inequality of variance.

3.1.2.3. Illustrations of typical or best use selected by participants: type of use and academic vs. non-academic use. We asked participants to share one note with us, selecting a note that illustrated their best or typical use of the software. We stored these notes, and authors AS and JL categorised them subsequently by function and by academic vs. non-academic use. In a few cases, notes were clearly both academic and non-academic in use (e.g. a to-do list containing academic and non-academic to-do items), while in a few other cases, it was not clear whether use was academic.

This process yielded 16 to-do lists, 14 instances of general information gathering, five literature searches/reference lists, four journal articles, three reflections, two recipes, two assignment drafts, two sets of study notes, two Christmas gift lists, two music listings, one photo of a lecture slide and one photo of an experimental set-up. One participant did not share a note.

A Chi-Square analysis was performed on the total number of categories for the clearly academic vs. clearly non-academic as a function of user category (Web/PC vs. mobile). This showed no significant difference, $X^2 = 0.023$, df = 1, $p > 0.05$. Mobile users shared 21 academic and 5 non-academic notes, while Web/PC users shared 15 academic notes and 4 non-academic notes, the remainder being mixed or unclear, and not included in the Chi-Square analysis. Thus, both user groups overwhelmingly chose to illustrate their typical or best use with a note with academic content. While this may reflect disproportionate selection of academic notes, possibly because participants may have perceived an expectation for academic uses on the part of the project team, this finding echoes other parts of the data (Section 3.2.2), which make this interpretation less likely, as these also suggest non-academic uses were rarer than academic uses. Interestingly, to-do lists were more numerous when participants were asked to illustrate their best or typical use (29% of notes), than in the usage data (12.7% in the usage count). Their disproportionate selection as "best or typical use" suggests participants found the to-do list function particularly noteworthy.

3.1.2.4. Innovative uses. In both the follow-up training and the evaluation session, individual users reported interesting uses, which we list here, as they may provide ideas for practitioners: Taking photos and annotate them with notes as a reminder of lab practicals; taking pictures of newspaper articles; taking pictures for art referencing; taking a photo of a model illustrated in a book from the library; organising and recording events; using as a diary to record activities; keeping meeting notes; using as a planner; logging discussions with dissertation supervisor; logging work timetable hours to track hours worked; and keeping placement notes. This range of uses demonstrate the versatility of the software for a range of purposes, as well as a willingness on the part of the students to adapt the software to their own needs.

3.1.3. Locations of use

We asked participants in which locations they used Evernote, from a list of pre-specified options (listed in Table 5). We counted each instance of a location that was selected, and tabulated the numbers as a function of the device used (web/PC vs. mobile). We had included an "other, please specify" option, which yielded one response, namely "partner's home", which we re-classified as "at home". The numbers thus obtained are presented in Table 5. A Chi-Square of the observed number of locations listed for web/PC (51) vs. mobile users (83) against expected values (69.9 vs. 73.1, respectively; based on actual user numbers) yielded a significant

Table 5
Locations of use. Note that users could indicate more than one location.

	Total	Web/PC	Mobile
At home	44	17	27
University in library	37	18	19
University in class	18	5	13
On computer in public place	8	6	2
Out and about	7	0	7
University in recreational or catering area	7	3	4
On transport	6	1	5
University outside on campus	7	1	6
Total	134	51	83

difference, $X^2 = 2.95$, df = 1, $p = 0.05$, with mobile users indicating more and non-mobile users fewer locations than would be expected by chance. Further, a Likelihood Ratio Test was performed on the numbers of mentions of the different locations by user category, and this showed a significantly uneven distribution of locations among web/PC vs. mobile users, $X^2 = 22.8$, df = 8, $p < 0.01$. Thus, the notion that mobile users would use Evernote in more locations was supported. Mobile users used the software more in class and more when in transit or outside traditional work areas. Interestingly, mobile users used the software in traditional computing locations (home, library) more than they did in non-traditional locations, which may reflect that ubiquitous working supplements, rather than replaces, the traditional work space. This is likely to be because it is easier to perform certain tasks in a desk-based environment.

3.2. Subjective experiences and user recommendations

3.2.1. Global ratings

As well as perceived utility and ease of use (Davis, 1989), perceived liking by users for a software tool plays an important role in decisions about adoption (e.g. Djamasbi, Strong, & Dishaw, 2010; Sanchez-Franco, 2010). To estimate participants' perceptions we asked them to rate the software's user-friendliness, reliability and speed of use, each on a scale of 1–5, where 1 was worst and 5 was best. The resulting data are presented in Fig. 2. The ratings did not differ significantly from each other as a function of user type (web/PC vs. mobile) on Mann–Whitney tests, with Mann–Whitney Us of 260, 286.5 and 326.5, respectively, N for Web/PC = 24 (note that one participant did not respond), N for mobile = 30, all $p > 0.05$. Therefore the different versions of the software were given equivalent ratings on factors that could have influenced adoption. Furthermore, the ratings for the three measures, by both groups combined, were not significantly different from each other on a Friedman test, $X^2 = 2.43$, df = 2, $p > 0.05$. Overall, ratings were at the high end of the option scale for both user groups, with no evidence of differential ratings on different dimensions. Thus, on all three dimensions, Evernote was rated positively.

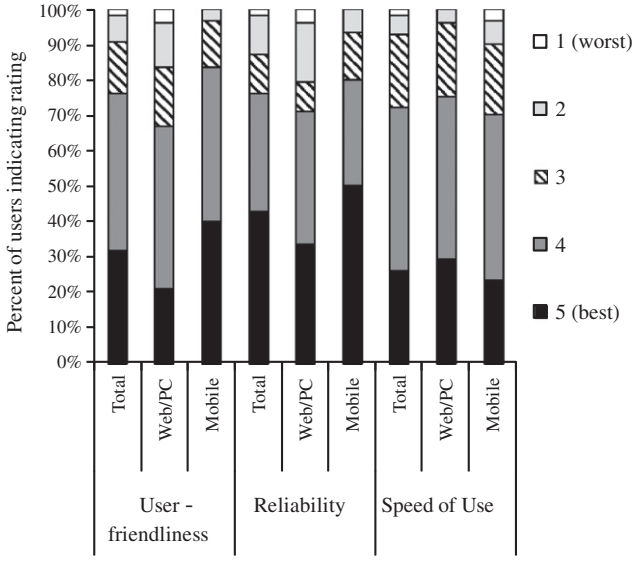

Fig. 2. Percentages of ratings on three dimensions, shown overall (total), and separately by user group. Note that the scale ran from 1 to 5, where 1 was worst, and 5 was best. For speed of use, it was further specified to participants that fastest was best.

3.2.2. Functional ratings

We also asked participants to rate how helpful they had found the software to support four potential functions, namely learning and study, reflection, organising, and uses beyond study. We included the "uses beyond study" as a control condition, in case students did not find the software useful for their studies. This allowed us to distinguish whether students found the software helpful but not for academic functions, or not at all helpful. At test we used five verbal anchors on our rating scale: very unhelpful, unhelpful, neutral, helpful, and very helpful. We converted these to consecutive numbers for the purpose of analysis by Mann–Whitney tests. The distribution of responses, with their original verbal anchor labels, is displayed in Fig. 3. User groups (web/PC vs. mobile) did not differ significantly on any of the helpfulness ratings, with Mann–Whitney Us of 287, 357, 313 and 321, respectively (Ns of 24 for web/PC [one did not respond] and 30 for mobile users). For learning and study, as well as organising, Evernote was rated as very helpful or helpful by a majority of participants, further showing the potential application of the software for university students. A large majority of participants gave neutral ratings on the helpfulness of Evernote for reflection, most probably because many had not tried it for reflection. Ratings for uses beyond study were moderately positive, but also showed a relatively large number of neutral responses, perhaps also because some users had not tried such uses. In this set there was a significant difference on a Friedman test in ratings for the different functions, $X^2 = 35.51$, df = 3, $p < 0.0001$. The statistical significance of this pattern of ratings shows that the users discriminated in their ratings for different functions, and they were not rating every measure uniformly. It also shows that there was sufficient statistical sensitivity to detect such differential ratings.

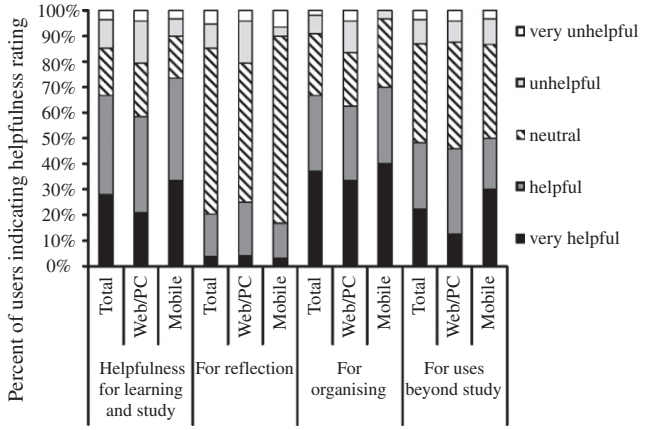

Fig. 3. Percentages of helpfulness ratings of Evernote for four different functional categories, with totals and separated by user group.

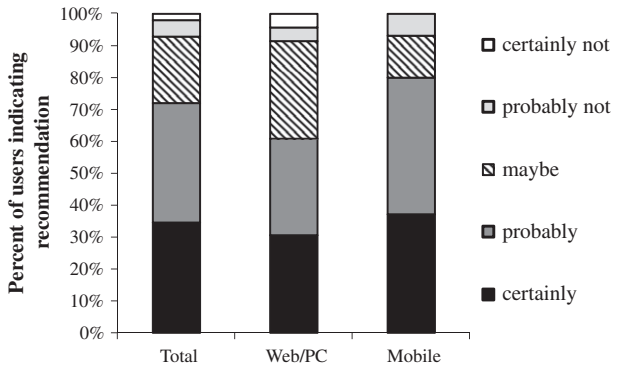

Fig. 4. Percentage of users choosing overall user recommendation categories listed, with totals and separated by group.

3.2.3. Global user recommendations

We asked participants to give a global judgement on whether they would recommend the software to other students, using a choice of five anchors, namely "certainly", "probably", "maybe", "probably not" and "certainly not". The percentage of users choosing each category is displayed in Fig. 4. Patterns in this global recommendation indicate a positive evaluation of the software, with 69% certainly or probably recommending the software to other students, 20% being neutral and only 7% probably or certainly not recommending this software to other students. A likelihood ratio analysis on the observed numbers, excluding those who did not respond, showed no significant differences in recommendation categories as a function of user types, $X^2 = 4.35$, df = 4, $p > 0.05$, indicating that mobile and non-mobile users felt similarly about recommending the software to other students.

3.3. Barriers

3.3.1. Technical problems

We asked participants whether they had encountered technical problems, and, if so, what the nature of their technical problems was. Of 55 users, 29 stated that they had not encountered technical problems, one did not answer, and of the remaining 25, 22 reported one problem, and three reported two problems. The resulting 28 technical problems were categorised in major categories, as shown in Table 6. Note that five of the web clipping problems involved not being able to clip with the favoured browser. Because of the relative rarity of the problems, we have pooled responses from mobile and Web/PC users in this instance, but note that in many cases the issues of self-evidently associated with one platform (e.g. App with mobile versions). Overall, problems were relatively rare, and about half were temporary.

3.3.2. Reactions to technical problems

We asked participants "If you had technical problems, what did you do?", listing a range of potential solutions, and a space for "Other" solutions. Thirty students in the sample chose "not applicable" (because they had not had technical problems). Of the remainder, 15 participants reported one solution, six students reported two solutions, three reported three solutions and one reported four, with a total of 40 solutions. Of these 40 solutions, most were positive reactions, aimed at solving the problem: 10 chose "try again later", 9 "ask project staff", 6 "solve problem myself", 3 "look at project web page", 2 "look at Evernote website", and 1 "download again". Negative reactions were less common: 9 chose "give up". Note, all solutions described above were listed by us, except "download again" which was written under "Other, please specify". Mobile and web/PC users had very similar distributions. Based on these data, it would appear that technical barriers are unlikely to have been a strong factor in limiting use in participants. These data may also be useful for readers in any support planning.

Table 6
Categories of technical problems encountered, with numbers of instances, and an indication of whether the problem was temporary, permanent or whether this was not stated. Note that some users reported more than one technical problem.

	Total reports	Temporary	Permanent	Not stated
Web clipping	8	4	4	0
App	7	4	3	0
Sync/load	4	1	1	2
Signal problem	3	2	0	1
Other	5	0	4	1
Total	28	11	12	5

3.4. Reasons for non-use or restricted use

We asked participants what any reasons for non-use were, if applicable. 69% of participants chose "not applicable", while a minority (31%) responded to this question, with three people giving two reasons, and 14 giving one reason. The 20 answers thus obtained fell into three broad categories. First, 45% of responses related to the opinion that other technology fulfilled the functions of Evernote either more easily or more effectively (e.g. diary, memory stick, Windows sticky notes, emailing to self, paper, cf Andrew, Karlson, & Brush, 2009); 30% of the responses were related to having to learn new habits, a new way of working, or remembering to use the new software; 15% were statements that the technology was too limited for their purposes, while 10% were associated with a lack of reliable internet access.

To illustrate the "new habits" issue, summary opinions showed a notable frequency of reports (14 instances) of a positive appraisal of the software paired with underuse. An illustrative quote is:

> *"I found Evernote a useful piece of software for creating to-do lists as it actually helped me sum up what I actually had to do. But I found myself really not using it as much as I probably should due to force of habit."*

A few participants suggested that introducing the software earlier in their programmes (or even at high school) may have made its usage more likely. Practitioners may therefore want to decide to introduce software of this kind in the early, rather than in the late stages of education programmes. While in our study the observations applied to a relative low number of participants, interestingly, the issue illustrates that a behavioural intention to use software does not necessarily equate with actual use, as assumed in some Technology Acceptance Models (Davis, 1989; see Turner, Kitchenham, Brereton, Charters, & Budgen, 2010, for a recent systematic review). In fact, even once a behavioural intention to use software is formed, further barriers, including prior habits, may need to be overcome. A discrepancy between intended and actual behaviour, via a lack of control over the behaviours, features in more general models of behaviour change (see e.g. Ajzen's 1985 theory of planned behaviour).

3.5. Stated impact of the software on user study behaviours or experiences

Echoing other parts of the data, participants felt that Evernote had allowed them to become more generally organised: *"I think Evernote is good because it gives an opportunity for people to organise themselves. It is good for me because I'm not good at organising so I would recommend it for people like me."* This concerned their time and work planning, both for tracking and for prospective memory

(see Lutters, 2004; Reason, 1984) *"...helping me remind myself of things that I need to do, especially the to-do list aspect"*. Participants also commented that they found it easier to keep track of references, when citing e.g. articles or internet sources, and this improved scholarly aspects of their work. Some said that they felt that they found it easier to put their sources into Evernote while writing assignments, so it was all in one place during the writing process, which meant that they did not have to switch between multiple internet-based sources (e.g. journal databases). Overall, the software facilitated a range of aspects of independent study behaviours by making a range of cognitive processes associated with these more streamlined.

Participants felt it was useful to use Evernote to support their work in multiple locations such as university and home: *"all the important information I found on the different websites I clipped into Evernote and ...then go back to it on Evernote when I go back home"* or university and ubiquitously *"...you have a certain checklist that can help you organise your assignments ... and you can access it really easily on your mobile"*.

Thus, in addition to giving Evernote positive evaluations, participants also told us that Evernote affected, in a beneficial way, their global organisation, how they worked and how they perceived the ease with which they could complete their work.

4. General discussion

The software was readily adopted for academic use, was viewed positively, and recommended by the majority of participants. Participants reported that the software helped them organise themselves and their information or ideas. As such, it had an impact on how they approached their studies. Self-organisation is an important part of the type of autonomous learning that is commonly expected at University (Credé & Kuncel, 2008), and a well-received tool to support self-organisation has great potential benefits.

One of our important foci was comparing mobile with non-mobile Evernote users. It emerged from our data that the two user groups were largely similar in their overall usage and recommendations, with only subtle differences between the two users groups. Some caution is necessary in interpreting the pattern, which largely shows a lack of significant differences, because it is possible that significant effects would emerge with the enhanced statistical power that would come with larger sample sizes. However, while it is possible that there are underlying differences that could be attributed user type, the general patterns in the data indicate that, if such underlying differences exist, they are likely to be small in relation to the general variation among participants. Thus, with caution, the findings indicate that the decision by participants to adopt the software was associated with the functionality of the software that is largely independent of the platform on which it is instantiated. Our findings suggest that practitioners deciding whether to adopt this, or similar, software in courses should not worry unduly about any inequality resulting from their decision for those not owning suitable mobile devices, as such potential concerns are not supported by the data. It is, however, possible, that advances in mobile technology may lead to greater use of mobile note-taking software in the future.

As might be expected, people with mobile devices used the software in more locations. However, their larger number of locations did not lead to a significantly greater overall usage, suggesting that mobile users transferred their use to different locations, without increasing their overall use significantly.

A subsidiary aim of our study was to examine whether Evernote would be adopted for reflection. While a relatively large proportion of our sample reported that reflection was compulsory on their courses (38%), the observed use of the software for reflection was very modest. This may suggest that users prefer to keep reflections in other ways, but it may also signal a general issue with students not engaging extensively in reflection in their independent study, possibly because of previously documented barriers (Boud & Walker, 1993). Boud and Walker suggest, inter alia, that cognitive barriers such as "lack of skills" or "established patterns of thought and behaviour" may inhibit reflection, alongside social or environmental factors, such as "lack of support from others" or "lack of opportunity to step aside from tasks" or factors related to the person, such as "threats to the self, one's world view or to ways of behaving" (Boud & Walker, 1993, p. 79, Table 5.1). Our data do not allow us to discriminate whether the lack of reflection is due to the use of other platforms or methods for recording reflections, or due to more general lack of reflection. As our data relied on spontaneous independent adoption, it is possible that students would adopt such software more readily for reflection if there were appropriate scaffolding, for example, via a course or teaching style (Hsieh et al., 2011) or via e-interaction (Salmon, 2011). The ubiquity of mobile note-taking software could make it attractive for students on professional placements, as they may be able to take notes and record thoughts and observations. However, this would need to be tested more fully in future research.

Interestingly, while there was little evidence of the use of the software for reflection, the higher number of idea notes in the mobile users suggests that the software was useful at capturing fleeting thoughts or insights, rather than more elaborate reflections. The increase in the ability to capture ideas as they arise is potentially of great importance, because ideas can occur suddenly, and can bring progress in complex problem solving, but their full relevance can be implicit initially (Hélie & Sun, 2010). Moreover, ideas can be fleeting and easily forgotten (Jarrold, Tam, Baddeley, & Harvey, 2011; Reason, 1984; Wixted, 2004). Thus, the ability to record ideas ubiquitously is valuable. The fact that students who had access to the software in its mobile version recorded more ideas suggests that introduction of the software could lead to potential gains in this aspect of academic functioning. Further, a series of such ideas, captured in real time, could potentially be useful for later reflection, depending on the nature of the ideas.

An important observation was that none of our participants expressed any concerns about the security of the cloud-based software, while such concerns do exist among Information Technology professionals (see Subashini & Kavitha, 2011, for a recent review). This suggests that the onus would be on practitioners who introduce students to cloud-based technology to educate those students about any associated risks. For example, it may be advisable to issue warnings about the storage of sensitive or confidential data involving the student or his or her patients, clients, students, pupils or other external parties, and students may need to be warned not to store financial, identity or password information on cloud-based services. Similarly, practitioners may wish to advise students to back up data stored on cloud servers, in case access to the data is prevented.

There are some aspects of our study that have an impact on the data, and that should be borne in mind when interpreting them. As part of our protocol, we offered participants payment for participation in the training and evaluation part of the study, but made it clear that payment was not related to the use of the software. The data show that participants had understood this separation between the research protocol element and the trial usage element of the study clearly, because some participants returned to the evaluation session having made few or no notes. This supports the idea that there was not a general perception that among participants that they would be obliged to use the software as part of their payment, which suggests that the data generalise beyond situations in which users are paid. Further, in our sample, all uses were self-generated, and supported only by the training and follow-up help, but without the supportive framework of a course or module in which

the software had been embedded. It is possible that more structural embedding leads to wider use. It is also important to emphasise that ours was a relatively short-term study. With more time, students may have continued to use the software in increasingly complex ways.

As there are many ways in which Evernote or similar software could be in used in learning settings, we discuss a few possibilities. Based on our observations, the software would be useful in library work because the web clipping function would provide a quick and easy way of storing the input and output of literature searches and scholarly records. This could offer potential quality enhancement in the scholarly aspects of academic work and a potential decrease in the risk of plagiarism or poor scholarship. Students on work placements may find it useful to store brief notes that can contribute to subsequent written work such as assessed placement evaluation reports. Students may also find note-taking software useful for the purpose of Personal Development Planning and the recording of achievements. Similarly, practitioners offering fieldwork (e.g. archaeology, geology, zoo studies) may find it useful to introduce Evernote or similar software to enable students to create notes and/or photographic records (possibly with location tagging), documenting their experiences or findings. Similarly, students involved in the production of artefacts, designs or performances may find it useful to document their creative processes and the development of their work. There are many potential uses of Evernote or other note-taking software that can enhance student learning and the student experience, but practitioners would need to establish which functions would serve their students' learning and development most effectively within their own pedagogical contexts.

5. Conclusion and recommendation

We found that the majority of our sample of undergraduate students from a range of disciplines readily adopted Evernote note-taking software in their independent study behaviours, with organisation, information acquisition and information management being the most frequently cited uses. Although there were some non-adopters, these were in a minority, and resulted primarily from a low utility appraisal, or difficulty in changing habits. The software was liked and recommended by a majority of our sample. Mobile and PC users liked, used, and recommended the software similarly. Our data suggest that the software may be useful to practitioners in higher education who want to offer mobile or cloud-based learning to students who have the technologies available, while also catering for students who prefer more traditional platforms. As stated, our study was intended to provide decision support to practitioners. While practitioners would need to consider carefully how they would use this, or similar, software in their learning and teaching programmes, our findings suggest that the ubiquitous and general nature of the software enables it to be applied to a wide range of educational functions and settings. Moreover it has a high probability of student acceptance and a low risk of disadvantaging students who do not own mobile devices.

6. Conflict of interest

We are not affiliated with the Evernote company, nor with any company producing mobile devices, and therefore do not declare a conflict of interest.

Acknowledgements

We gratefully acknowledge project funding from the University of Chester, through its Learning and Teaching Institute's Pedagogy Projects Scheme. We are grateful to Jethro Newton, Kate Irving, Julie-Ann Regan for valuable feedback. We thank Lisa Rojas for her extensive practical support and Henry Blackman for computer systems support. We gratefully acknowledge the work of Nicci Banks on the background ownership data. We are grateful to our critical friends on the project, Derek France and Janice Gidman. We are thankful for very thoughtful reviewer comments, which have helped us improve this article.

References

Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In J. Kuhi & J. Beckmann (Eds.), *Action-control: From cognition to behavior* (pp. 11–39). Heidelberg: Springer.

Andrew, A. H., Karlson, A. K. & Brush, A. J. B. (2009). Investigating the use of voice and ink for mobile micronote capture. In Gross, T. Gulliksen, J., Kotze, P., Oestreicher, L., Palanque, P., & Prates, R. O. (Eds.), *Human–computer interaction – interact 2009, Part I*. Book series: Lecture notes in computer science (Vol. 5726, pp. 782–795).

Aubusson, P., Schuck, S., & Burden, K. (2009). Mobile learning for teacher professional learning: Benefits, obstacles and issues. *ALT-J: Research in Learning Technology, 17*(3), 233–247.

Bekhradnia, B. (2009). The academic experience of students in English universities (2009 report). Higher Education Policy Institute. <http://www.hepi.ac.uk/466-1393/The-Academic-Experience-of-Students-in-English-Universities-%282009-report%29.html> Accessed 28.06.11.

Boud, D., Keogh, R., & Walker, D. (1985). *Reflection: Turning experience into learning*. London: Kogan Page.

Boud, D., & Walker, D. (1993). Barriers to reflection on experience. In D. Boud, R. Cohen, & D. Walker (Eds.), *Using experience for learning* (pp. 73–86). Bury St. Edmunds, Suffolk: St. Edmundsbury Press.

Cacioppo, J. T., & Petty, R. E. (1982). The need for cognition. *Journal of Personality and Social Psychology, 42*, 116–131.

Chao, P. Y., & Chen, G. D. (2009). Augmenting paper-based learning with mobile phones. *Interacting with Computers, 21*(3), 173–185. doi:10.1016/j.intcom.2009.01.001.

Corlett, D., Sharples, M., Bull, S., & Chan, T. (2005). Evaluation of a mobile learning organiser for university students. *Journal of Computer – Assisted Learning, 21*(3), 162–170.

Credé, M., & Kuncel, N. R. (2008). Study habits, skills, and attitudes: The third pillar supporting collegiate academic performance. *Perspectives on Psychological Science, 3*, 425–453.

Davis, F. D. (1989). Perceived usefulness, perceived use and user acceptance information. *MIS Quarterly, 13*, 319–340.

de-Marcos, L., Hilera, J. R., Barchino, R., Jimenez, L., Martinez, J. J., Gutierrez, J. A., et al. (2010). An experiment for improving students performance in secondary and tertiary education by means of m-learning auto-assessment. *Computers & Education, 55*(3), 1069–1079. doi:10.1016/j.compedu.2010.05.003.

Djamasbi, S., Strong, D. M., & Dishaw, M. (2010). Affect and acceptance: Examining the effects of positive mood on the technology acceptance model. *Decision Support Systems, 48*(2), 383–394. doi:10.1016/j.dss.2009.10.002.

Evernote.com (2011a). Evernote Corporation, 710 Lakeway Drive #290 Sunnyvale, CA 94085, USA <http://www.evernote.com/>. Accessed 28.06.11.

Evernote.com (2011b). Evernote Corporation, 710 Lakeway Drive #290 Sunnyvale, CA 94085, USA. <http://www.evernote.com/about/download/web_clipper.php>. Accessed 28.06.11.

Evernote.com (2011c). Evernote Corporation, 710 Lakeway Drive #290 Sunnyvale, CA 94085, USA. <http://www.evernote.com/about/video/#zHom6bgqg9Y|1|1>. Accessed 28.06.11.

Evernote.com (2011d). Evernote Corporation, 710 Lakeway Drive #290 Sunnyvale, CA 94085, USA. <http://www.evernote.com/about/video/#GxDCZlXB8uU|2|2>. Accessed 28.06.11.

Fallon, M. (2002). Handheld devices: Toward a more mobile campus. *Campus Technology*. <http://campustechnology.com/articles/39270/>. Accessed 28.06.11.

Hammond, M., Hawtin, R., Gillam, L., & Oppenheim, C. (2010). *Using the cloud for research – Final report*. Cloud Computing for Research. JISC Project report, via <http://www.jisc.ac.uk/media/documents/programmes/research_infrastructure/cc421d007-1.0%20cloud_computing_for_research_final_report.pdf>. Accessed 28.06.11.

Hélie, S., & Sun, R. (2010). Incubation, insight, and creative problem solving: A unified theory and a connectionist model. *Psychological Review, 117*(3), 994–1024. doi:10.1037/a0019532.

Hinett, K. (2002). Improving learning through reflection. Part 1 and part 2. York: Higher Education Academy. <http://www.heacademy.ac.uk/resources.asp?process=filter_fields&section=generic&type=some&id=29>. Accessed 21.09.11.

Hsieh, S. W., Jang, Y. R., Hwang, G. J., & Chen, N. S. (2011). Effects of teaching and learning styles on students' reflection levels for ubiquitous learning. *Computers & Education, 57*(1), 1194–1201. doi:10.1016/j.compedu.2011.01.004.

Jarrold, C., Tam, H., Baddeley, A. D., & Harvey, C. E. (2011). How does processing affect storage in working memory tasks? Evidence for both domain-general and domain-specific effects. *Journal of Experimental Psychology: Learning, Memory and Cognition, 37*(3), 688–705.

Johnson, L. F., Levine, A., Smith, R. S., & Stone, S. (2010). Horizon report. Austin, TX: The New Media Consortium. <http://www.nmc.org/pdf/2010-Horizon-Report.pdf>. Accessed 28.06.11.

King's College London (2011). Survey of arts and humanities students on technology enhanced learning. <http://www.kcl.ac.uk/content/1/c6/08/34/76/AHe-learningsurveyresults.pdf>. Accessed 22.09.11.

Laughlin, P. R., & Wong-McCarthy, W. J. (1975). Social inhibition as a function of observation and recording of performance. *Journal of Experimental Social Psychology, 11*(6), 560–571. doi:10.1016/0022-1031(75)90007-4.

Liaw, S. S., Hatala, M., & Huang, H. M. (2010). Investigating acceptance toward mobile learning to assist individual knowledge management: Based on activity theory approach. *Computers & Education, 54*(2), 446–454.

Libin, P. (2011). Evernote tops ten million users. <http://blog.evernote.com/2011/06/page/2/>. Date: 06.06.11. Accessed 28.06.11.

Lutters, W. G. (2004). Identifying expertise markers in routine work artifacts: Exploring micronote taking behaviour. *Computers in Human Behavior, 20*(2), 185–199. doi:10.1016/j.chb.2003.10.014.

Liu, Y., Li, H., & Carlsson, C. (2010). Factors driving the adoption of m-learning: An empirical study. *Computers & Education, 55*(3), 1211–1219. doi:10.1016/j.compedu.2010.05.018.

Macaskill, A., & Taylor, E. (2010). The development of a brief measure of learner autonomy in university students. *Studies in Higher Education, 35*(3), 351–359.

Martin, S., Diaz, G., Sancristobal, E., Gil, R., Castro, M., & Peire, J. (2011). New technology trends in education: Seven years of forecasts and convergence. *Computers & Education, 57*(3 1893-190). doi:10.1016/j.compedu.2011.04.003.

Motiwalla, L. F. (2007). Mobile learning: A framework and evaluation. *Computers & Education, 49*, 581–596.

Office for National Statistics (2011). *Population estimates by ethnic group 2002–2009: Statistical bulletin*. <http://www.ons.gov.uk/ons/rel/peeg/population-estimates-by-ethnic-group–experimental-/current-estimates/population-density–change-and-concentration-in-great-britain.pdf>. Accessed 27.09.11.

Reason, J. T. (1984). Lapses of attention in everyday life. In R. Parasuraman & D. R. Davies (Eds.), *Varieties of attention*. New York: Academic Press.

Salmon, G. (2011). *E-moderating: The Key to online teaching and learning* (3rd ed.). London: Routledge.

Sanchez-Franco, M. J. (2010). WebCT – The quasimoderating effect of perceived affective quality on an extending Technology Acceptance Model. *Computers & Education, 54*(1), 37–46. doi:10.1016/j.compedu.2009.07.005.

Sandberg, J., Maris, M., & de Geus, K. (2011). Mobile English learning: An evidence-based study with fifth graders. *Computers & Education, 57*(1), 1334–1347. doi:10.1016/j.compedu.2011.01.015.

Smith, S. D., & Caruso, J. B. (2010). *The ECAR study of undergraduate students and information technology, 2010* (research study, Vol. 6). Boulder, CO: EDUCAUSE Center for Applied Research, 2010, Note: with an introduction by Kim, J. <http://www.educause.edu/Resources/ECARStudyofUndergraduateStuden/217333>. Accessed 28.06.11.

Subashini, S., & Kavitha, V. (2011). A survey on security issues in service delivery models of cloud computing. *Journal of Network and Computer Applications, 34*(1), 1–11.

Turner, M., Kitchenham, B., Brereton, P., Charters, S., & Budgen, D. (2010). Does the technology acceptance model predict actual use? A systematic literature review. *Information and Software Technology, 52*(5), 463–479. doi:10.1016/j.infsof.2009.11.005.

Wald, H. S., Davis, S. W., Reis, S. P., Monroe, A. D., & Borkan, J. M. (2009). Reflecting on reflections: Enhancement of medical education curriculum with structured field notes and guided feedback. *Academic Medicine*, 84 (7), 830–837, doi: 10.1097/ACM.0b013e3181a8592f, via <http://journals.lww.com/academicmedicine/Fulltext/2009/07000/Reflecting_on_Reflections__Enhancement_of_Medical.9.aspx>. Accessed 21.09.11.

Wixted, J. T. (2004). The psychology and neuroscience of forgetting. *Annual Review of Psychology, 55*, 235–269.