

Education Studies Students 2.0?

Stephen Dixon, Richard Sanders, Stephen Griffin
Newman University College, Birmingham

Corresponding author: Stephen Dixon

Email: s.dixon@newman.ac.uk

Tel: 0121 476 1181 Ext 2427

Abstract

At Newman University, Birmingham, as in much of UK HE, there is a concerted effort to move towards models of e-assessment, blended and distance learning. Set against this is the ongoing and persuasive discourse that tells us our students have changed (Prensky, 2001, et al), making grandiose claims as to their digital expertise. However, the rhetoric presupposes a habitual engagement with a range of technological and immersive tools whilst never questioning basic levels of skill or access. These, we feel, are dangerous assumptions, based upon the initial findings presented in this paper. Drawing on an ongoing longitudinal study - which comprises of data from two separate academic years and approximately 800 respondents - this paper provides an initial comparison of the digital literacy levels of Education Studies undergraduates against the rest of the Newman University undergraduate population. Early findings have shown that even though high proportions of all students commonly use more than one device to access internet-based services outside of Newman, the 'nativeness' of Web 2.0 tool use is brought into question. Student engagement with online collaborative authoring tools can be related to experiences within their programme of study - with a much higher proportion of Education Studies students having an awareness of these, due to a focus on online collaborative assessments within the programme. When investigating whether students actively contribute to differing categories of tools, there is limited content creation activity outside of social networking sites, with higher levels of contribution apparent for Education Studies students who are required to use particular tools as part of their study. Declared familiarity with particular categories of tools is also brought into question, as actual knowledge of the online tools available is limited – demonstrated in this paper by closer inspection of video sharing sites such as Youtube. Initial findings suggest that our students would fit the profile highlighted by Bennett & Maton (2010), where undergraduate technological skills are not as predominant as is often assumed. The widening participation background of Newman University may also mean that socio-economic differences in the student population may be a key factor in these initial findings (Bennett et al, 2008). These initial findings will be used to inform focus group questioning of Education Studies and other undergraduates at Newman University, to further investigate whether supposed 'immigrant' lecturers are actually a significant influence on student use of technology.

Keywords: Digital divide, digital literacy, e-learning, online assessment, web 2.0, social networking, VLE

Introduction

A pervasive rhetoric has emerged that tells us that our students have changed, one that assumes that there is a new generation of learners, separated from both their forebears and current teaching staff by their immersion in digital technologies. This generation's supposed skills and interests are seen as highly significant for education. Since Prensky's concept of the *Digital Native* (2001: p1), this persuasive discourse has proliferated over the last decade, with Raines' *Generation Y* (2002), Veen's *Homo Zappiens* (2004: p3), Oblinger and Oblinger's *Millennials* (2005: p24), Tapscott's *Screenagers* (2008: p3), and more recently, Palfrey and Gasser's *Digital Settlers* (2008: p3) and Rosen's *Net Generation and I-Generation* (2010; p20).

There are remarkable similarities between each of these theories - each sees education as dangerously out of step with the behaviour and philosophy of its student population, whilst at the same time making grandiose claims as to students' digital expertise. This, it could be argued, is no modern discourse – Selwyn (2009) notes that this has been part of popular rhetoric since the concept of the 'computer hacker' and 'gamer' in the 1970s. Similarly, the new rhetoric identifies a new generation of students immersed in technology, with sophisticated technological skills and new cognitive abilities. This technological immersion (itself a questionable assumption) presupposes an innate affinity with digital constructs, and unquestioned high levels of media and digital literacy.

The supposed affordances of new media and technological tools are an inherent part of this rhetoric. In particular, web 2.0 tools are seen as empowering, leading to active, engaged users, and allowing sociable and collaborative creativity, and consequently, new learning styles. The characteristics used by O'Reilly (2005) in his appropriation of DiNucci's (1999) term web 2.0 to describe this new generation of online activity is quite revealing: "collaboration", "exchanging", "wisdom of crowds", "harnessing of collective intelligence", and an "architecture of participation". Digital natives are seen to be both au fait and immersed in a world of supposed second-generation Internet-based services — tools such as social networking sites, social bookmarking, instant messaging, social recommendation and discovery, file-sharing, wikis, communication tools, and folksonomies — that emphasize both sharing and online collaboration. Similarly, media theorists such as David Gauntlett (2011a) argue that digital media has 'fundamentally changed the ways in which we engage' and that web 2.0 tools allow us to harness 'the collective abilities of the members of an online network' (2011b: p7). Their potential is seen as not only re-shaping education, or as an alarm call for education to change (Prensky, 2001: p6) but as allowing empowered students to transform it for themselves (Tapscott, 2008: p134).

When taking this rhetoric into consideration, we [As educators] are left wondering where this leaves us with our own students. We as "digital immigrants" (Prensky, 2001: p1), would be seen as outside this prevalent discourse, yet at the same time, from anecdotal interactions with our learners, it is increasingly obvious that they do not seem to fit into the pattern of behaviour that is being described here. Are we missing an opportunity to provide enhanced technology-enabled learning that our students expect to utilise within daily life, including study, or are these views verging on a technologically deterministic viewpoint that do not fit with our students experiences and backgrounds? In order to begin to address these questions, the

following sections provide a more detailed account of our learning context at Newman and the ongoing methodology established for further investigation.

The Newman Context

Newman University College is a relatively small UK higher education institution (less than 3000 FTE students), and sits on the outskirts of Birmingham in the West Midlands. Originally founded as a teacher training college in 1968, it has since grown to encompass a broad range of undergraduate and postgraduate provision mainly within the domains of the humanities and social sciences. The Education Studies degree is offered on the Combined Honours degree programme, and recruits students within the contemporary climate of 'widening participation'. Cohorts tend to include a number of mature students, as well as learners with non-traditional qualifications. Significantly, a number of the students are the first from their family to study at University, and the entry requirements are relatively low in the national context. These, we feel, are important contextual considerations.

In the Education Studies programme we attempt to engage the students with a range of online tools with which they, according to the prevalent discourse, would be conversant. Education studies, as part of the Combined Honours degree, affords students the opportunity to study Education as an interdisciplinary subject through the varying lenses of philosophy, psychology, sociology, history and politics. The course engages readily with the use of digital media both in terms of student access to course materials through Moodle (the institution's VLE), assessment procedures, (such as audio feedback through the use of mp3 files) and collaborative work through the use of wikis, blogs, forums, posters, web design and video production. Students in the third year are able to elect the *Education and Technologies* module where they are expected to demonstrate that they can use these new technologies in their own creative educative production, which offers a critique of technologies and learning.

At Newman University College students are actively encouraged to engage with modules in a variety of ways both individually and as part of a group. Consequently module materials typically range from traditional peer reviewed articles, book chapters and readings, to multimedia formats such as video clips and mp3 files. Assessment procedures also range from the individual traditional essay to a variety of paired and group assessments. These reflect a broadly social and co-constructivist approach to student learning where knowledge is negotiated and constructed through conversation (Kanuka and Anderson, 1999). This is also borne out by a strong emphasis on tutorials where students often seek advice as part of a group rather than individually. There are links here also to Lave and Wenger's community of practice where "Knowing can be (...) understood as the intentional activity of individuals who, as members of a community, make use of and produce representations in the collaborative attempt to better understand and transform their shared world" (Wells, 2001: p76). In essence then our students are encouraged to 'negotiate' meaning through argumentation and the developing of a consensus.

Methodology

When constructing a methodology for the analysis of our students' use of Web 2.0 tools, we have been particularly mindful of existing research methodologies in this area. Since 2004, EDUCAUSE's Centre for Applied Research (ECAR) has been active in researching students' use of technology via a yearly longitudinal study that encompasses over 100 institutions in the US (Smith & Caruso, 2010); Jones & Ramanau's investigation of 1st year 'net generation' students entering university across 5 institutions in the UK (Jones & Ramanau, 2009); and Oxford Universities SPIRE (Secure Personal Institutional and Inter-Institutional Repository Environment) survey looking at the popularity of Web 2.0 services, which attracted a total of 1369 respondents (White, 2007). These, and other works with this type of focus, utilise similar methodologies that have also been employed within our own context, and these are summarised below:-

- A quantitative web based survey of Newman University College students' use of Web 2.0 tools
- Qualitative data from open ended questions within the survey.
- Qualitative data from interviews with students [At the time of writing these are still on-going, and will be fully explained in future work]

This paper provides a perspective from the initial quantitative phase of this work, which will be used to inform the on-going qualitative focus group questioning and analysis of responses to open ended questions – an important reflective phase before further investigation is undertaken with a large body of data. It is important to note that the presented initial findings provide a particular case study perspective of Newman University and it is not necessarily possible to generalise results to other institutional contexts. As such, future comparative work needs to be performed to see what possible (if any) relationships can be established. In order to aid comparison, we have based our quantitative web based survey on one previously constructed for the SPIRE project, with a few adaptations that will allow us to investigate specific lines of enquiry in relation to the *Digital Native* assumption. Originally looking at undergraduate use of Peer-to-Peer (P2P) tools, the SPIRE project shifted its focus towards a more general investigation of the use of informal participatory services. This was agreed by JISC, the funding body, on the understanding that such a survey would act as a useful guide for both recommendation and strategic implementation, as well as offering an opportunity to acquire quantitative data on the uptake of such services (White, 2007).

The Newman survey was implemented using the Survey Monkey service (similar to SPIRE), and designed on a checkbox model, in order to facilitate both faster responses from users and easier access to data from Survey Monkey datasets (Sanders, 2012). All students engaged with Foundation Degree, Undergraduate and Postgraduate courses were invited to complete the survey via email and leave contact information should they be willing to take part in the focus group phase of the work. Students engaging with the survey were required to initially declare their programme of study to enable comparative interpretation of compiled data across this particular dimension. In terms of questions relating to the use of Web 2.0 tools, these were designed to discover both general levels and context of use. The

approach is primarily quantitative, whilst allowing for qualitative discussion in follow up focus groups. Respondents are asked questions on their use of a range of tools, including social networks, calendars, image sharing, online communication, blogs, wikis and collaborative authoring tools, podcasting, video sharing, social bookmarking, file sharing and online gaming, as well as more “traditional” institutionally supported services, such as the VLE (Moodle), OPAC (Online Public Access Catalogue), email services, e-books, etc.

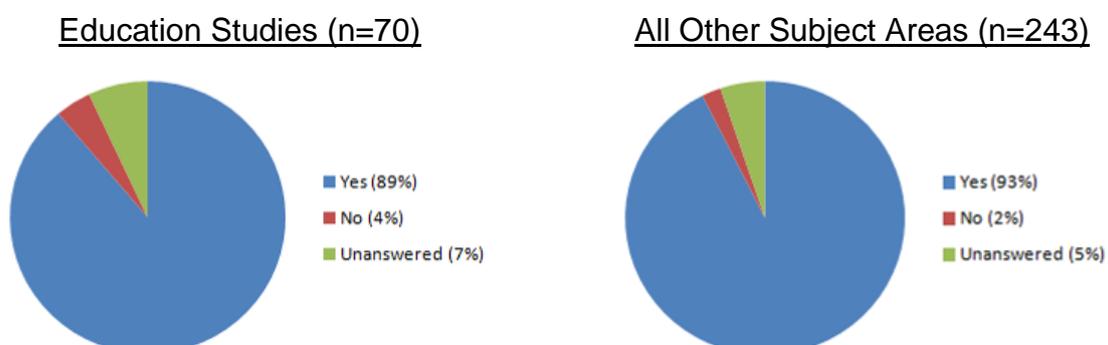
We have now completed a second year of gathering survey data for this project, with the intention of turning this method of research into a longitudinal study allowing us to compare progression of attitudes [And use) over time for our own context, as well as comparison of our own work to the existing research mentioned above. The following section provides initial data trend findings we are seeing from the most recent implementation of the survey, with the intention of highlighting areas that may require a particular focus in future analysis and data gathering.

Survey Data on Internet Access

Extracts are presented here from an initial review of the submitted quantitative web based survey data. This initial review helps to inform further questioning of survey respondents in interview scenarios, potential directions for further detailed analysis, and modifications to the survey to enable future iterations of this research to be targeted in areas that are deemed of interest.

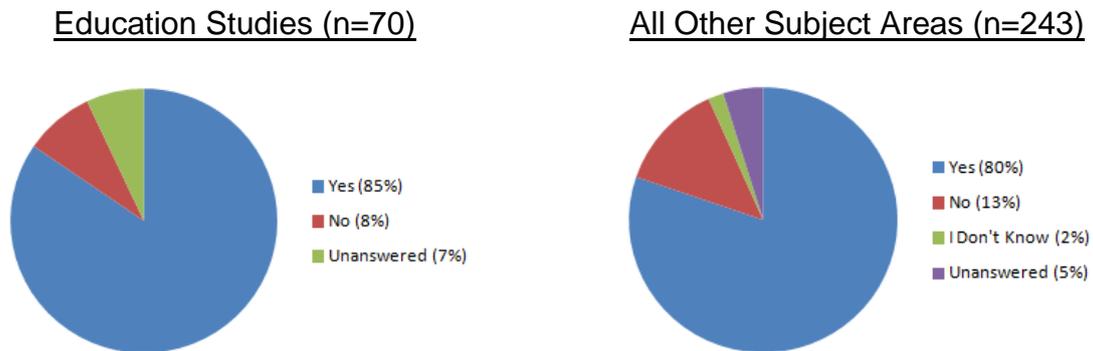
A total of 340 students responded to the survey in academic year 10-11, of which 313 respondents were deemed as appropriate for use within the analysis [After ignoring data that did not provide any meaningful responses to the categorised questions). Out of these 313 respondents, 70 were from the Education Studies subject area, leaving 243 students from other subject areas. Unlike those initially seen by MacLeod and Paterson (2011) in a similar study, return rates for the questionnaire were particularly high [Around 19%) for each cohort, which includes 31% of all Education Studies students. Respondents initially engaged with basic demographic questions, including their ability to access broadband Internet from home, which is presented in the pie charts shown below.

Graph 1 – Pie Charts Showing Student Access to Broadband Internet from Home



Respondents were also asked whether they had mobile devices that were capable of accessing the internet and/or email, producing the following results:

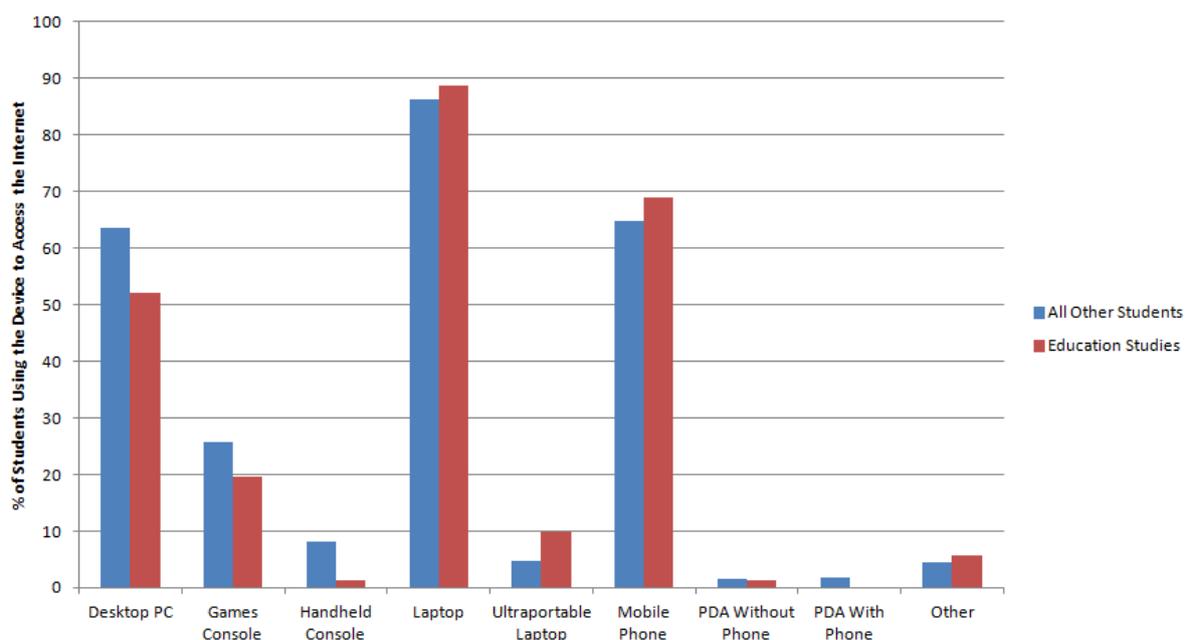
Graph 2 – Pie Charts Showing Capability of Accessing Internet and/or Email on Mobile Phones



The results show a broadly comparable range of responses between the two sets of students in terms of ability to access the Internet outside of University, with Education Studies students being slightly more likely to access the Internet via mobile devices and students from other subject areas being slightly more likely utilise a fixed line broadband connection. Interestingly, the overall number of students being able to access Internet services via a mobile device – 80% - is much higher than the 62.7% found by Smith and Caruso (2010) in their similar study.

Data was also collected on the types of devices used to access the internet and as the graph shows below, the 2 most dominant devices used by students are Laptop and Mobile Phone portable devices, with the next most significant device being a desktop PC.

Graph 3 –Devices Used by Students to Access the Internet

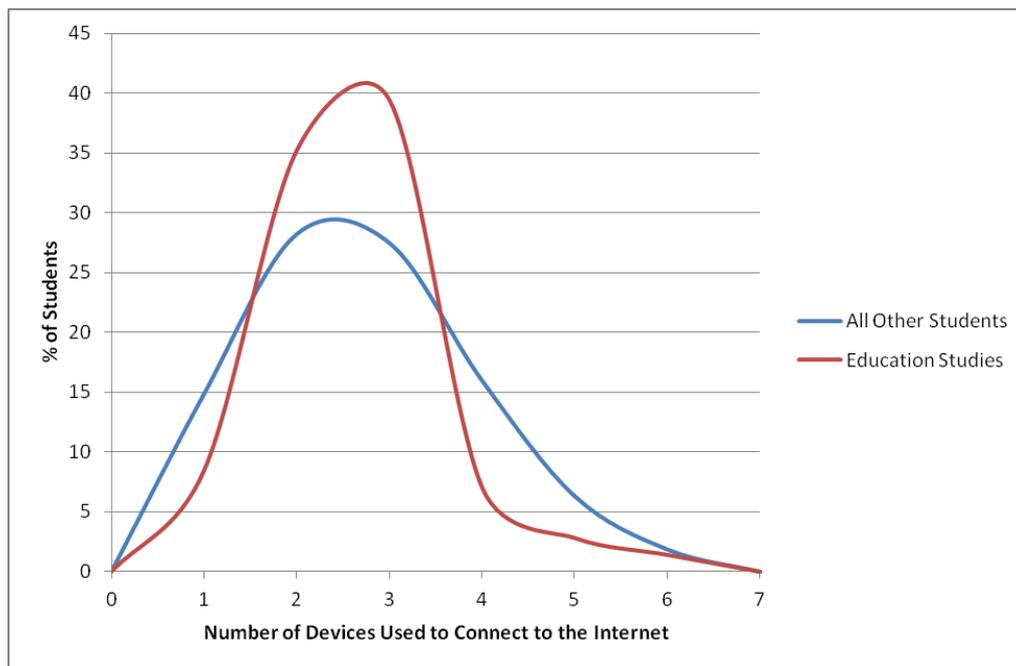


These 2 datasets of results are generally comparable, with Education Studies students showing a slightly higher likelihood of using a mobile device to access the

Internet. This is not surprising considering a marginally higher utilisation of mobile Internet connection. It is interesting to note that within both datasets, students who have identified themselves as using a mobile phone to access the Internet also use a Desktop PC and/or Laptop. Future surveys will attempt to identify which devices are used for particular types of online interaction with services.

The graph presented below shows distribution curves for the amount of devices used to connect to the internet across the 2 datasets, which provide a view on mean and standard deviation for Education Studies students compared to the rest of the student population.

Graph 4 – Distribution of the Amount of Devices Used to Connect to the Internet by Students



The graph above shows broadly comparable bell shaped distribution curves, with the most likely amount of devices used for both datasets being 2 or 3. The fact that the majority of students in both datasets are likely to be accessing online resources and tools across multiple devices indicates that respondents do not seek out access to online resources through a single device. For the majority of students, convergence of information and its subsequent access is not occurring within the confines of a physical technology, supporting the view of Jenkins (2006a: p3) that the bringing together of information is not occurring from a purely technological perspective. At face value, students would seem to be engaging with [And making sense of) streams of information from multiple devices. There is a noticeable difference between these two datasets, in terms of a lower standard deviation for Education Studies students (characterised by the steep curve) when compared to the rest of the student population. The reasons for this difference are not clear and we feel that this warrants further investigation during interviews, as well as the collation of future data to see if this difference persists. Similarly, more detailed analysis is required to investigate whether certain student demographic profiles within the submitted data (internet access, devices used, age, year of study, employment and sex) provide new perspectives within the following section on web 2.0 tools.

Survey Data on Use of Web 2.0 Tools

When considering survey data on web 2.0 tools, students were asked to respond to general questions around categories of tools as well as on their specific use. Table 1 below provides a summary of the types of tools reported on within these initial findings.

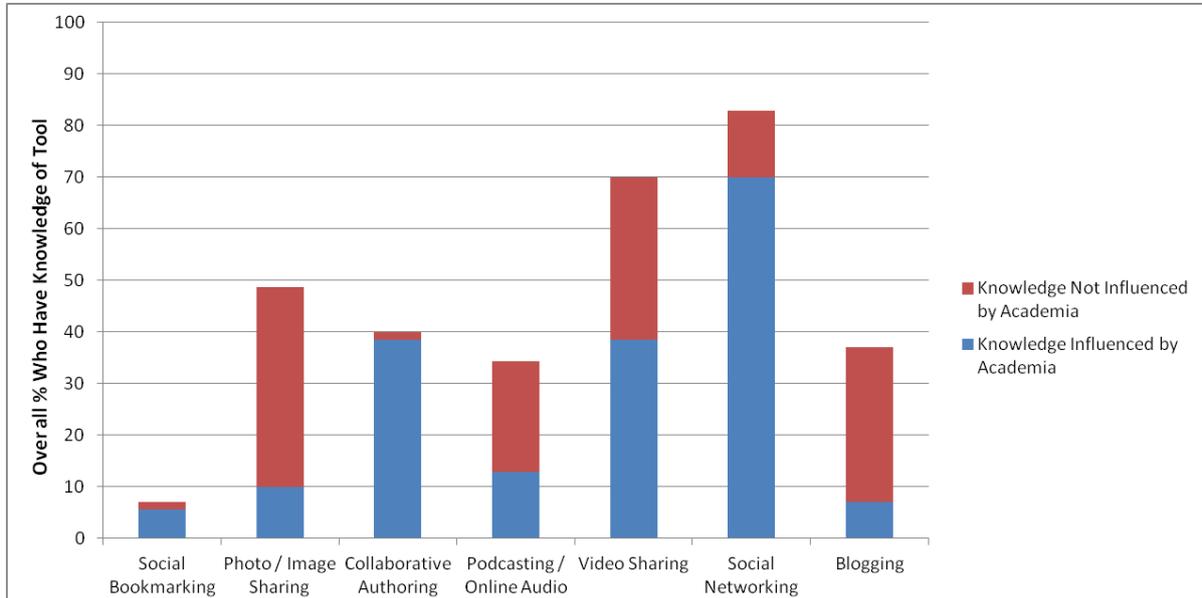
Table 1 – Categories of Web 2.0 Tools used within the Survey

Tool	Examples
Social Bookmarking	Diigo, etc.
Photo / Image Sharing	Picasa, Flickr, Photobucket, etc.
Collaborative Authoring	Wetpaint, Moodle Wiki, etc.
Podcasting / Online Audio	Podomatic, iTunes, etc.
Video Sharing	Youtube, Vimeo, etc.
Social Networking	Facebook, Bebo, etc.

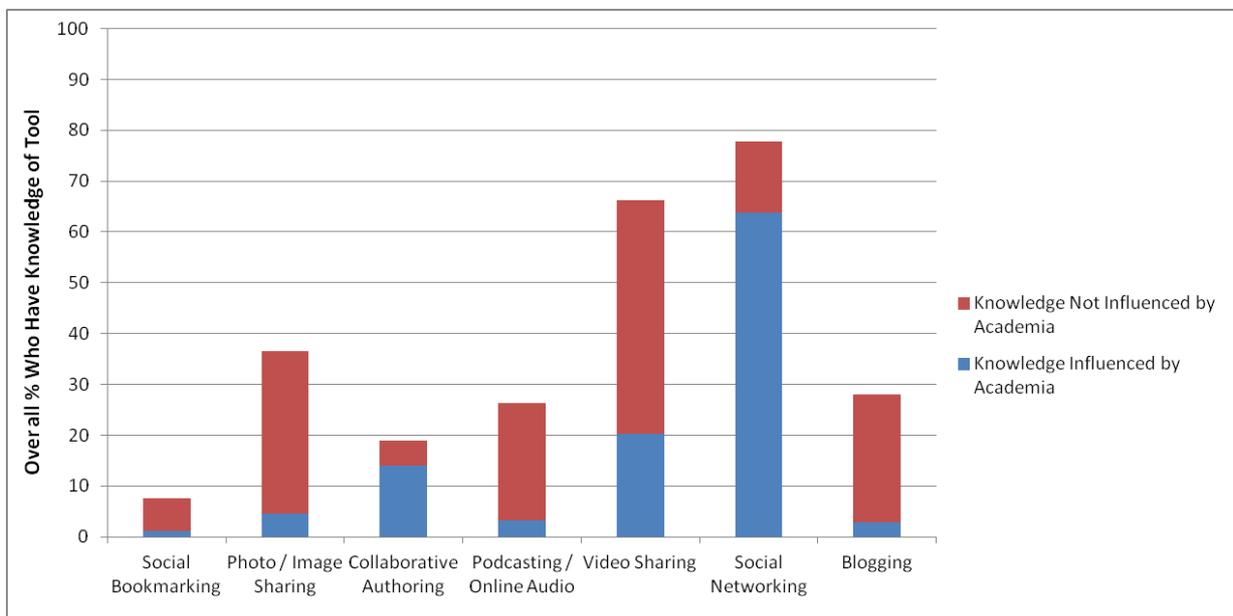
In responding to the questionnaire, students were required to indicate both an awareness and nature of their use within a range of web 2.0 tools: whether they had heard (had knowledge) of tools within each category; whether their knowledge is influenced by academia (staff and students) or by another source outside of the academic context (for example friends and family); whether they use the resource; and whether this use is viewing or viewing and contributing. We considered responses to the final question as being particularly pertinent – Bruns (2008: p2) for example, draws attention to the themes of *produsage* that new technologies afford, and we saw these as very much part of the *Digital Native* rhetoric.

The following graphs provide an overview of the results we have gathered regarding the aforementioned categories of Web 2.0 tools for Education Studies students, in relation to all other students who have taken the survey. The bars within each figure give an overall percentage of students who have stated that they have knowledge of the tool, with each bar indicating what has influenced their knowledge in this area.

**Graph 5a - % of Education Studies students who have knowledge of particular web 2.0 tools
[And how this knowledge has been influenced]. (n=70)**



**Graph 5b - % of all other students who have knowledge of particular web 2.0 tools
[And how this knowledge has been influenced]. (n=243)**

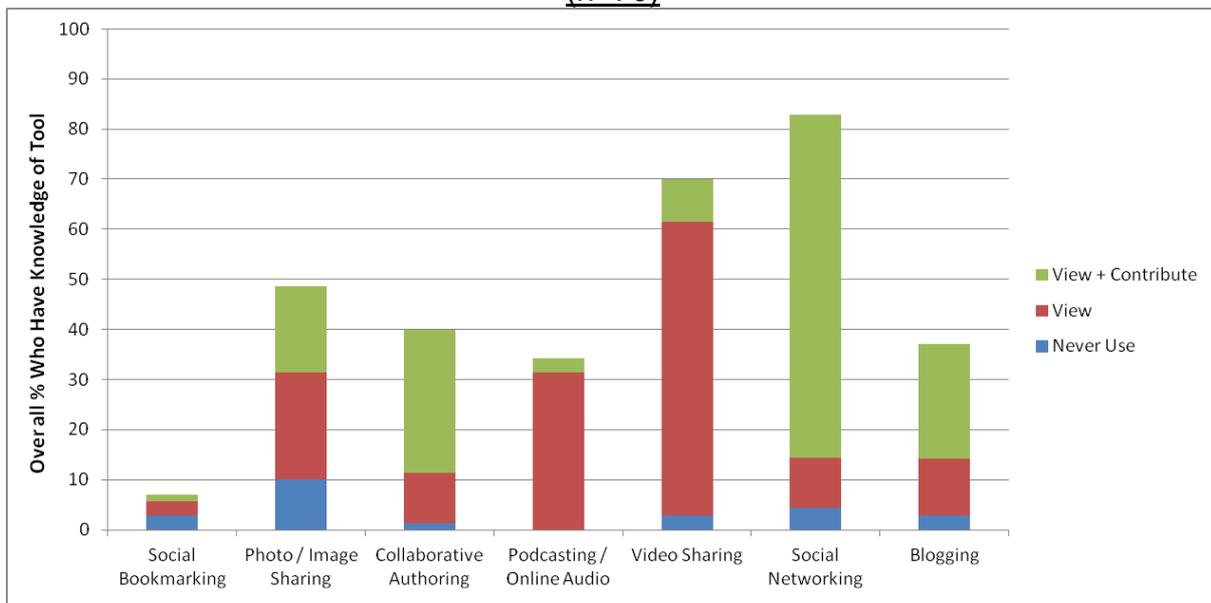


An initial overview of the data has provided us with some interesting results. We would argue that familiarity with certain tools is very much dependent on the nature of their use, particularly with regards to those that have relevance to “casual entertainment”. It is obvious that declared knowledge of certain technologies (eg

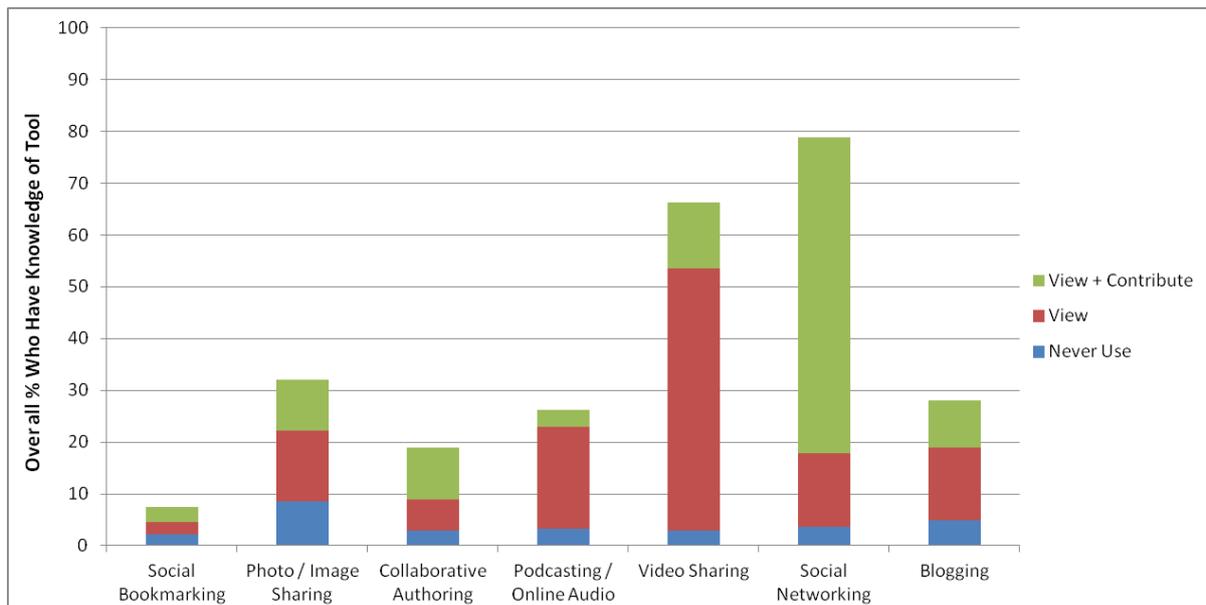
Video Sharing, Social Networking and Photo Sharing) are the highest and these can be seen more as ‘lifeworld’ technologies. Others, such as Social Bookmarking / Collaborative Authoring may be perceived as ‘systemworld’. Social networking influence from academia is unexpectedly high – one would have imagined that the majority of students attend university already having a social networking presence. However, on examination, this influence appears to come from student peers, rather than teaching staff. In contrast, the use of video sharing sites is markedly higher for Education Studies students than for those on other courses. This may be due to the fact that the programme makes greater use of these in the classroom context than other subject areas, as well as embedding them into assessment.

There certainly seems to be an overall (logical) trend, when looking at the results, that the more a particular tool is utilised within an academic setting, the more likely it is that a particular group of students will claim to have knowledge of the tool. The Education Studies programme makes strong use of collaborative authoring tools (e.g. wikis), and this is clearly shown in the data. Generally, only 20% of Newman University College students have knowledge of these, but for Education Studies students this rises to 40%. This can be seen as having a direct relationship to knowledge gained within an academic setting (the strongest influence within the academic setting is from the lecturer). In terms of *nativeness* (Prensky, 2001: p1), and linking directly to Bruns’ (2008: p2) comments on *produsage*, Graphs 6a and 6b below provide the overall percentages of students who have knowledge of the tool, and each bar within the graph indicates the nature of student use, from never used, content viewing, and content contribution.

Graph 6a - % of Education Studies students who have knowledge of particular web 2.0 tools [And how they use them] (n=70)



Graph 6b - % of all other students who have knowledge of particular web 2.0 tools
[And how they use them) (n=243)



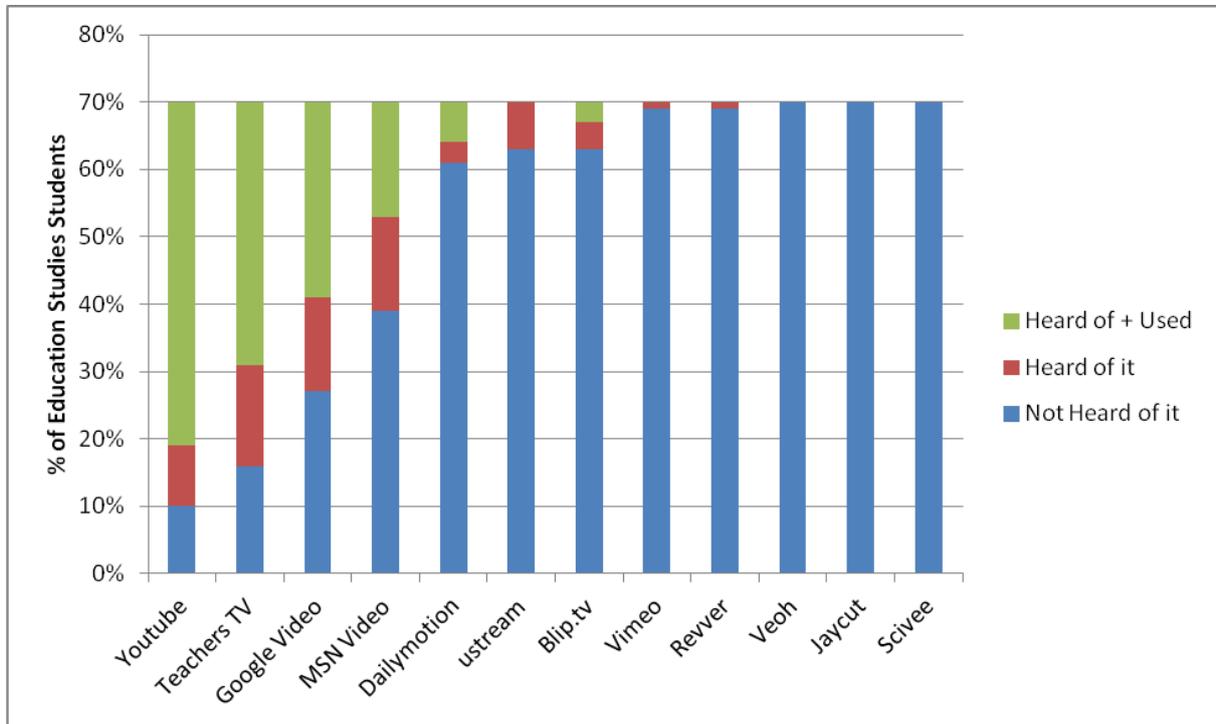
As would perhaps be expected, the majority of students across all subjects are heavily engaged in contributing to social networking sites. However, for a range of other web 2.0 tools, we are seeing a direct correlation with the amount of student contribution and their use in the academic context. For example, Education Studies students are much more likely to contribute to collaborative authoring sites, such as wikis. Again, this may be attributed to our input as lecturers, as they are expected to do this as part of their coursework. When investigating whether the type of device (Desktop PC, mobile phone, laptop, etc.) used to access the internet has any impact on viewing or contributing, no significant differences were found from the distribution of data presented above.

It is interesting that Podcasting, or Online Audio tools have the lowest relative levels of contribution compared to other web 2.0 tools. From anecdotal evidence, it is possible that this is due to the degrees of comfort that students have with different modes of communication, and a lack of confidence and expertise with audio recording techniques. Whereas Education Studies students are extremely enthusiastic about receiving audio feedback for their assessments, for example (Dixon, 2010), they are often very reticent to participate in online lectures (utilising Moodle's Big Blue Button tool) via microphone or webcam. Perhaps more alarmingly, initial discussions with students on their use of mobile phones also indicate that most feel much more comfortable communicating via text than voice. These observations from the data and our own practice will be investigated further as part of the focus group phase of our work.

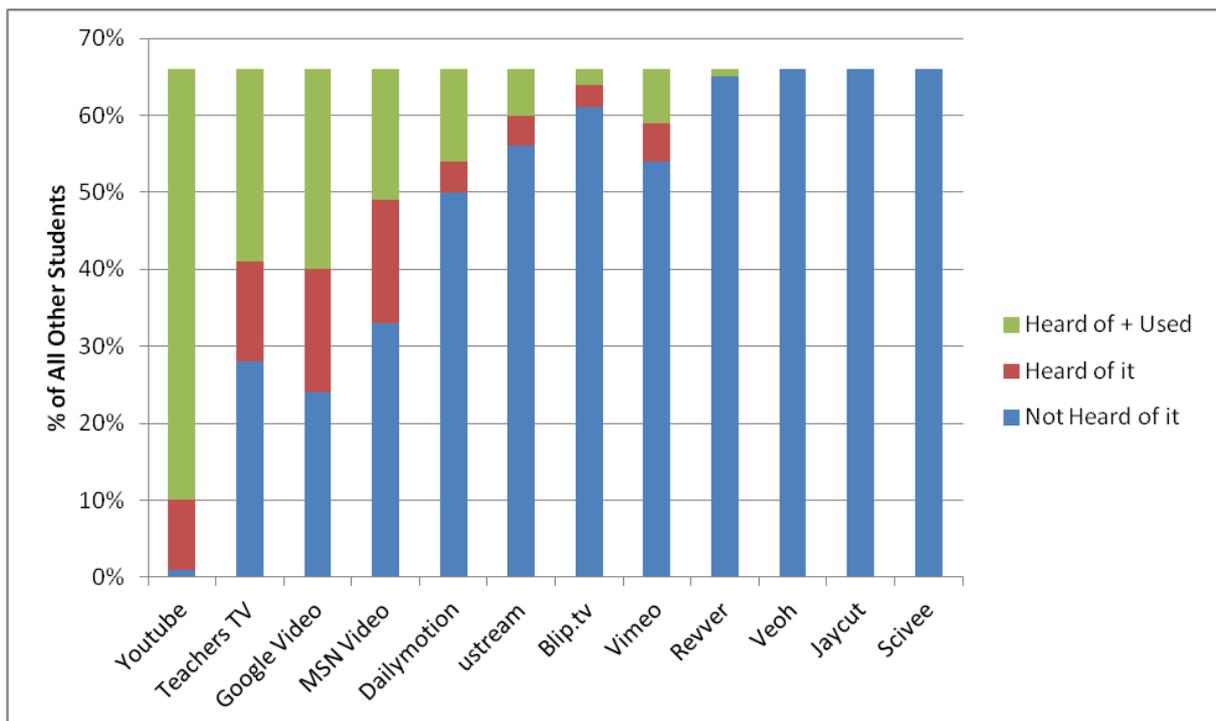
When considering MacLeod and Paterson's study (2011), where three quarters of students surveyed declared themselves as being entirely confident in their use of ICT (or at the very least looking forward to the challenges they face), it would seem that the results shown above for both sets of students do not follow this trend. For Newman University College students, only Video Sharing and Social Networking tools provide comparable declared response rates, with all remaining categories

showing a much lower level of declared knowledge. A distinction has to be made here between *declared* knowledge and *actual* knowledge, as a more detailed examination of students' use of video sharing tools shows:

Graph 7a – Education Studies Students - Knowledge of Specific Video Sharing Web Sites



Graph 7b – All Other Students - Knowledge of Specific Video Sharing Web Sites



When initially comparing Education Studies students to the rest of respondents, the one noticeable difference is the level of student interaction around Teachers TV, with a higher percentage of the former using this video sharing application – hardly surprising, given the focus of the subject area. However, what is strikingly common between the two sets of results is the limited number of video sharing sites that are familiar to, or used by students, with the vast majority of activity centred on YouTube. Due to this limited engagement with the wide range of online applications available, we would question the extent to which users' knowledge [And actual confidence] match their declared responses. Video sharing web sites have been identified as an area of interest within the ongoing interview stage, where students' knowledge and contributions (*produsage*) are being investigated to see how far this quantitative view is reflected in the qualitative interview data.

Conclusion

JISC's (2012) recent progress report on "*Digital Visitors and Residents*", whilst primarily focusing on individual and group motivations to engage with digital technologies rather than simply tracking which technologies are popular, still utilises the binary distinction so prevalent in the identified discourse (Residents are seen to have significant online presence and usage and a high level of online collaboration, whereas Visitors make more functional use of technology and a less visible online presence). The key difference here, however, is the identification of contextual patterns of behaviour – students may be "Visitors" whilst at university, but clearly 'Residents' in their personal use of technology, for example. Many are now questioning the blanket generational descriptions advocated by Prensky et al, through not only eliminating any assumed links between age and technological engagement, but also pointing to a much more complex picture. JISC (2012) for example, argue for the need to distinguish apparent technological aptitude from learning literacies, such as critical evaluation and information seeking. A key provisional finding of the JISC report is that many digital literacies are developed by learners in a trial-and-error manner without the direct support or advice of educational institutions. This obviously has serious implications for us as educators.

Bennett and Maton (2010) highlight that students may not be as skilled with technology as often assumed, and "that the familiar issues of equity and student training still need to be considered." This may ring very true for an institution such as Newman. The assumptions made in the *Digital Native* rhetoric also tend to ignore issues such as economic and cultural capital, which we feel need to be considered, particularly within our widening participation context. There will be opportunities to examine these issues much more closely with future cohorts – as Bennett et al (2008) highlight, the nature and frequency of young peoples' use of technology may differ between age group and socio-economic background. Similarly, Sanchez et al (2011), in their study of young people in Chile, question the uniformity of generational experience presumed by Prensky et al, and although highlighting that the variety of experiences are not necessarily determined by socio-economic context, fail to identify any implied skills described in the literature as different and distinctive from those present in previous generations. In terms of basic access, Prensky's view that 'students will find a way to get online' (2010) and Rosen's assumption that 'Students will find a way to go online because the online world is so much a part of their social

sphere...the students will find a way to connect to cyberspace,' (2010: p17) deserves close scrutiny, particularly as there are potentially 11% of Education Studies who do not have broadband access.

Although students at Newman make widespread use of social networking sites, and to a lesser extent media sharing tools, there is little familiarity [And indeed ease) with collaborative knowledge creation tools. This may be problematic when placed against our avowed intention to encourage students to 'negotiate' meaning through argumentation and the developing of a consensus. As Selwyn (2009) illustrates, much of the empirical evidence has shown that young peoples' use of technology is much more complex than the simplified assumptions of the *Digital Native* commentary would suggest. Indeed, studies such as Margaryan and Littlejohn (2008), and Bennett and Maton (2010), to some extent echo our own findings. In the first instance, we have certainly identified the need for careful consideration of the assumptions we make on student ability and levels of *nativeness*, and even on the choice of tools used to support their learning. We are also beginning to identify an inherent contradiction. It can be seen that there is a real danger that we as educators are actually influencing our students' online behaviour, as it seems that we ourselves are introducing the students to tools that we pre-suppose they are already using. Yet, whilst leading and directing the students in this, as lecturers 'of a certain age' we would ourselves be seen as outside the prevalent discourse, and classified as 'digital immigrants' (Prensky, 2001: p1). Again, this echoes Margaryan and Littlejohn's (2008) findings that students' attitudes to learning appear to be influenced by the approaches adopted by their lecturers.

As MacLeod and Paterson (2011) highlight, we as educators need to be aware that although students may feel prepared from their own informal use of ICT, we will be asking them to make use of technologies in new and challenging ways. We have highlighted apparent contradictions between a student's self declared confidence and actual use (particularly regarding video sharing sites), as well as different patterns of use in what may be termed 'lifeworld' and 'systemworld' technologies. Initial findings from both data collected and discussions with students also hint at this possibility of a Higher Education equivalent of Selwyn's "digital disconnect" (2011: p29), what Buckingham (2007) highlighted as the gap between internet and digital media use inside and outside educational institutions. Highlighting the dangers of an approach in school that could be seen as quite limited in contrast to one allowing for much communication and entertainment, Buckingham labelled this as the "new digital divide" (2007: p144).

The *Digital Natives* thesis can be a persuasive [And often seductive) understanding, one that is indeed popular with our own students, notwithstanding the apparent contradiction between users' actual knowledge and declared responses. However, although only the initial findings of an ongoing study, these would seem to question the debate's assumptions of the levels of digital literacy we would expect amongst our undergraduates. Although it would be convenient for us to assume Prensky's (2001: p1) view of digital natives when considering our students, such a generalist and over-simplified attribution does not sit comfortably with our experience. Initial discussions have shown that both mature students [A large percentage of whom are parents) and their younger counterparts appear to lack the instinctive 'native' aptitude for learning in online networked spaces that are described as new forms of literacy, and thus essential skills for participation in culture by those such as Jenkins (2006b)

and Heppell (2008). The powerful *Digital Native* rhetoric has helped to shape public expectations, but in the context of our experience at Newman, appears not merely redundant but naïve – a shift from ‘mere’ technological determinism to a form of ageist determinism and even techno-evangelism, what Bennett et al (2008) rightly claim to constitute an academic moral panic.

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