

Laptops for students: Understanding and evaluating the drivers for change

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Abstract

This paper describes the development of the student laptop initiative at the University of Strathclyde, examines the process by which this project became an embedded service and assesses the impact that this technology-rich, pedagogically flexible initiative has had on institutional structures, roles and processes. The authors use the MIT90s Model for Institutional Change to explore the way in which technology influences organisational development. A wealth of quantitative and qualitative evidence has been gathered over the last 7 years to support the examination of whether the benefits of the initiative justify the cost to the student and to the institution.

Keywords

student laptops
e-learning
higher education
evaluation
organisational change
support services

1. Introduction

This paper describes the development of the student laptop initiative at the University of Strathclyde, examines the process by which this project became an embedded service and assesses the impact that this technology-rich, pedagogically flexible initiative has had on institutional structures, roles and processes. The authors use the MIT90s Model for institutional change (Scott Morton 1991) to explore the way in which technology influences organisational development. A wealth of quantitative and qualitative evidence has been gathered over the last 7 years to support this examination of whether the benefits of the initiative justify the cost to the student and to the institution.

2. Organisational context

The University of Strathclyde's genesis lies in the 1796 founding of Anderson's University. It received its Royal Charter in 1964 and shares the greater Glasgow area with the significantly older University of Glasgow and two post-1992 universities, Glasgow Caledonian University and the University of Paisley. It is the third largest University in Scotland, teaching more than 20,000 full time students within five faculties, has the largest Engineering Faculty in Scotland and, following its 1993 merger with

Jordanhill College of Education, is the country's principal teacher education institution. The undergraduate population is 96% UK in origin, the majority coming from the Scottish central belt. Because of its extensive distance learning, continuing professional development and lifelong learning courses, it is the United Kingdom's largest provider of postgraduate and professional education, amassing a community of 50,000 people through these schemes. The University employs 3,700 people with 1,600 members of academic and related staff.

The University's original mission in 1796 was to be 'a place of useful learning' and there is a strong emphasis on research combined with relevance, as the University seeks to maintain its reputation as a centre of excellence and innovation and its UK position as a major research university. A 2005 survey involving 10,000 first-year students across the United Kingdom found the University of Strathclyde rated top overall, when students were asked to rate their university in a wide range of relevant areas (Wojtas 2005).

Land's model of academic landscape combines a number of models of HE organisation and is helpful here to describe the organisational landscape of Strathclyde (Land 2004). In common with many redbrick universities and, increasingly, older universities, Strathclyde combines what is inherently a collegiate environment with a hierarchical management structure, with the resultant tensions that this brings. Individual academics have enjoyed a high level of autonomy in terms of the direction of their research and their approach to teaching and curriculum design. This autonomy can be seen at the department level, where heads of department are collegiately elected, through to the decision-making devolved to the separate faculties. Placed on top of this, collegiate landscape is a hierarchical management and committee structure, where the RAE (Research Assessment Exercise) and teaching quality activities result in increased pressure to conform to standards and encourage the centralisation of decision-making.

3. Effecting organisational change at Strathclyde

Effecting organisational change within this collegiate/hierarchical environment requires a two-fold approach. Any large-scale programme of change in modern HE requires central, high level support, a champion for the programme. However in a collegiate landscape, effort must also be focussed on gaining grassroots support by engaging with individual staff through consultation and involvement, not only in the implementation of innovation but during its design. The collegiate environment demands careful and concurrent consideration of both senior management and operational stakeholders if top-down and bottom-up drivers for change are to be aligned and support services successfully implemented.

Many might argue that this type of collegiate organisation is not as adept at responding and adapting to external drivers for change as private sector organisations operating in a competitive, commercial environment (Golightly 2000).

This paper challenges that perception by examining the way in which institutional change can be facilitated from the 'bottom-up', with individual departments, faculties or support services able to react swiftly to changes in the internal and external environment because of their autonomy within the collegiate structure and their close links to their 'market' and customers.

1 For further information see <http://www.strath.ac.uk/business/accreditations/#d.en.40739>.

4. The Strathclyde laptop initiative

The planning for the SLI began in 1999 with the objective of assessing the benefits, costs and organisational issues related to student laptop usage. This was one of the earliest and largest student laptop schemes in the United Kingdom, building on the experience of similar schemes in the United States (Thornbury, Law and Henderson 2003). Through a tendering process, IBM was selected to be the laptop supplier through their 'ThinkPad' scheme. Much of the reasoning behind their selection was the intended mitigation of risk through the utilisation of IBM's uniquely extensive experience of implementing such projects in the United States. Additionally, the company was perceived as a highly respected and highly stable partner.

Following a competitive internal process, the University selected the 'Integrative Core' class (Belton, Johnston and Walls 2001) as its initial pilot. The Integrative Core (IC) was a mandatory class run centrally by the University's Business School and was taken by the majority of first year students within the Business School. The Business School at Strathclyde is one of less than 1% of Business Schools worldwide with the triple accreditation of AACSB, EQUIS and AMBA.¹ In addition to offering a substantial cohort of students, the IC was chosen because it was felt that recent changes to its pedagogic approach could be enhanced by laptop usage, and the faculty and course leaders were keen and ready to implement any changes required in the short lead time of 4 months between the project go-ahead and the start of academic year 2000/01.

The initial objective of the pilot was to examine the pedagogic and infrastructure implications of institutionally promoted laptop use. Only after the implications of this were carefully examined, and the cost-benefits to both institution and individual students assessed, did the University instigate and promote a student purchase scheme.

In the first pilot year all 354 students on the IC were given a personal laptop to keep for the duration of the academic year. Numbers have risen in successive years to over 500, as additional cohorts within the Business School adopted the class. The class currently involves 95% of the faculty's first year students with the numbers in 2006/07 reaching an all time high of 578.

After the success of this initial pilot, the scope of the SLI expanded. While recognising that many classes might benefit from all students having a laptop it would be untenable for the University either to impose such a pre-requisite on undergraduates or to fund the expansion from central funds. Consequently the University instigated a scheme for IC students to

Year 1 – 2000/2001	• 1st year business faculty – 354 laptops • John Anderson Library – 20 laptops in loan pool
Year 2 – 2001/2002	• 1st year business faculty – 510 laptops • Engineering faculty, multi-year – 60 laptops • Educational psychology, post-graduate remote – 25 laptops • John Anderson Library – 20 laptops • Open contract for sales to staff and students
Year 3 – 2002/2003	• 1st year business faculty – 480 laptops • Engineering faculty – 60 laptops • Educational psychology, PG remote – 25 laptops • John Anderson Library – 20 laptops • Jordanhill Library – 10 laptops • Open contract • Special needs
Year 4 – 2003/2004	• 1st year business faculty • Engineering faculty, multi-year • John Anderson Library – 20 laptops • Educational psychology, PG remote – 25 laptops • Jordanhill Library – 10 laptops • Open contract • Special needs
Year 5 – 2004/2005	• 1st year business faculty • Engineering faculty, multi-year – 60 laptops • Educational psychology, PG remote – 25 laptops • PGDE primary – 330 students • Open contract • Special needs provision
Year 6 – 2005/2006	• 1st year business faculty • PGDE primary • Jordanhill Library – 10 laptops • Law school pilot • B Ed pilot • Open contract • Special needs
Year 7 – 2006/2007	• Business faculty, integrative core – 480 laptops • PGDE primary • Engineering faculty NEW teaching space – 50 laptops • Law school pilot • B Ed pilot • Jordanhill Library – 10 laptops • Open contract • Special needs

Table 1: Timeline for the Strathclyde laptop initiative.

purchase laptops from IBM through the University. Constant access to a laptop was still a requirement for students on this course, but from Year 2 of the initiative onwards there were three ways to satisfy this condition. Firstly, a student could buy through the SLI scheme. Secondly, they could bring their own laptop purchased from elsewhere and lastly they could, if unwilling to purchase, borrow one from the University for the academic year ahead for a returnable deposit of £100. Thus, the University could make the use of laptops in this class mandatory as no student need be without a laptop, whatever their financial position.

In order to further expand the use of laptop technology, an open contract was implemented in 2002. This allowed all students and staff to purchase laptops, regardless of their involvement in one of the mandatory classes. Numbers for this contract have risen each year. Concurrently the number of 'mandatory' laptop classes (i.e. classes where all students are expected to have bought a laptop or borrowed from the University) increased with implementations in the Engineering Faculty (60 laptops) and with a cohort of Educational Psychologists (25 laptops). As part of this explicit plan to spread the SLI through the University, the SLI also became the laptop supply vehicle for University special needs students.

The development and expansion of the scheme is summarised in Table 1.

5. The MIT90s model for change

In order to explore the way this initiative developed in the institution, it was useful to adopt a framework through which the complex set of inter-related factors that affected the SLI could be examined and better understood. A number of criteria were defined to inform the selection of a suitable change model. The model must:

- Focus on the role of technology in driving and facilitating organisational change;
- Recognise that in organisations such as universities 'culture' may have a significant effect on change;
- Accommodate 'top-down' and 'bottom-up' drivers for change.

Considering these, the MIT90s Model for Institutional Change (Scott Morton 1991) was selected as a suitable framework. The MIT90s model (see Figure 1 below) was developed by Prof. Michael Scott Morton in Massachusetts Institute of Technology to describe the way in which technology influences organisational development. This framework comprises five components – strategy, technology, structures, management processes and individuals and roles – that operate within and interact with the external environment.

Although its initial development was based on research conducted in the commercial sector, its holistic view of organisational change and the fact it's recognition that change can be driven from a number of directions

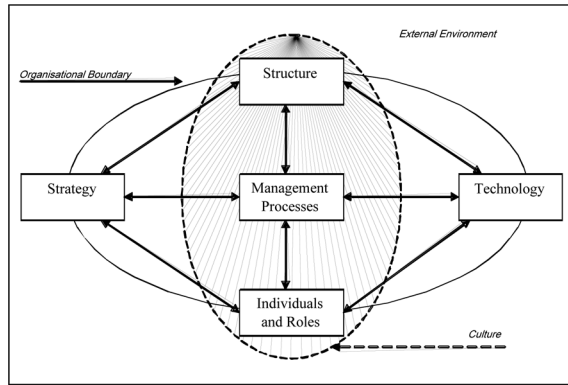


Figure 1: MIT90s framework.
Source: Adapted from Scott-Morton; 1991.

concurrently make it a suitable model for the purpose of reviewing the SLI. The framework has previously been utilised by Coen and Nicol (2007) to examine organisational change in the HE sector driven by the adoption of e-learning technologies and the changing expectations of students. Yetton at the University of New South Wales has also used it to examine the impact of IT on Australian universities (Yetton 1997).

The development of the SLI and its impact on the organisation is examined below through the five-component elements of the MIT90s plus the ‘external environment’ within which the initiative developed.

6. External drivers for change and strategic reaction

In the late 1990s a number of external factors converged to raise the issue of student laptop computing within the University of Strathclyde. Firstly, Recommendation 46 of the Dearing Report into HE (1997) stated

‘We recommend that by 2000/01 higher education institutions should ensure that all students have open access to a Networked Desktop Computer, and expect that by 2005/06 all students will be required to have access to their own portable computer’.

The Government’s response (UK Government 1998) noted:

‘. students are increasingly equipping themselves with PCs and that the trend towards student ownership of PCs may be expected to continue’.

Although HEIs had a variety of responses to these reports, they did put access to computing facilities, laptop ownership and questions of funding firmly on the agenda. Additionally it was becoming evident that the emergence of new approaches to learning and teaching facilitated by new technologies would also require greater access to computing equipment.

Internal research at that time within Strathclyde University showed that over 80% of the University's undergraduate population would invest in a personal computer during their degree studies, constituting a significant existing investment by the student body. Increasing use of e-mail and the web by existing and incoming students raised expectations of the use of ICT in their studies, an example being the growing requests for digital access to course material directed to teaching staff. It was against this backdrop that the University of Strathclyde sought to develop an innovative and coordinated approach to teaching and learning at the cusp of the millennium.

Sir John Arbuthnott, the then Principal and Vice Chancellor of the University of Strathclyde, was a member of the Dearing Committee and chaired its IT Working Group. Consequently the institution's strategy for 1997–2001 reflected many of the aspirations of the Dearing Committee. The strategy also recognised the need to utilise new technologies and approaches to enhance the students' learning environment. These aspirations were encapsulated in the University of Strathclyde's Millennium Student Project, an overarching initiative comprising a number of inter-related activities designed to deliver, in the words of the vision statement for the Millennium Student Project, 'a leading-edge learning environment in which students have a rich learning experience, acquire the skills to take advantage of it and have access to the tools which will manage it'.

The University also gave consideration to the relative exposure to risk that these projects represented. Although the HE sector can draw upon best practice from other sectors, when it comes to embedding technology in the teaching and learning process much of the applied research and development has to be conducted within the sector. Organisations like the Joint Information Systems Committee (JISC) and the HE Academy can help manage this risk by funding projects and encouraging collaboration, but institutions which wish to differentiate themselves in some way have to bear the risk associated with being an early adopter within the Sector. By taking a lower-risk approach to many of the other aspects of the Millennium Student Project, Strathclyde was comfortable in taking a lead within the sector, and thereby potentially differentiating itself, through its approach to student laptop computing, which did bear significant risk.

Although the Dearing report correctly assumed that student laptop usage would grow greatly during 1998–2005, the vision and implementation of the SLI at Strathclyde was also affected by a number of other factors:

- The reducing cost of laptop technology, making it more affordable for students and institutions
- The desire of some major manufacturers to make inroads into the UK HE market through collaboration with institutions
- Pressure to better utilise the physical campus, and the assumption that laptop computers can allow more flexible use of teaching and learning spaces.

Visits were made to allow senior University staff to view how several US campuses had implemented widespread programmes of supported student laptop initiatives. (Sargeant and Svec 2003). Although the US education sector is markedly different from that in the United Kingdom, most noticeably in relation to the acceptance that students, in the main, will fund their own education and all associated costs, the visits proved extremely informative. The existence of successful exemplars, from which lessons could be drawn, increased institutional confidence regarding the way forward and also helped reduce the risk of being one of the first UK institutions to consider implementing such a scheme.

From the experience of the US universities, it was clear that only a pilot implementation of substantial size would allow the University to answer the questions posed by the Dearing Committee and by the University's own desire to improve the quality of the student experience. The SLI team were also very aware that only a pilot of considerable scale would provide the basis, both in terms of profile and knowledge, from which to expand. This large-scale pilot allowed the University and faculties to develop a plan for financial sustainability – a pre-requisite for any areas that wanted to join the growing initiative.

7. Technology

Unlike many other e-learning initiatives, the SLI does not require a specific pedagogical approach. The SLI provides a technological infrastructure or basis, which can then be harnessed to aid different models of teaching and learning as appropriate to the situation. A key aspect of its flexibility is the removal of traditional constraints on use of ICT, as this is no longer restricted to classes held in computer labs.

Freeing the curriculum from the restrictions that the physical estate previously imposed introduces significant opportunities. For example, problem-centred learning can be more easily supported as there is no need to anticipate and make specific provision for ICT use as it is always to hand. There are many ways that this ubiquitous aspect of ICT use can be harnessed in teaching and learning, and from this perspective, the SLI can be considered pedagogically flexible, in that it does not require or dictate that a specific pedagogy is applied but can support any pedagogic approach underpinned by ICT.

Clearly, the successful integration of numerous types of individual technologies into a teaching and learning environment could be a very difficult task. Additionally, local experience at the University indicated that the support of these devices from an ICT perspective becomes more time-consuming as the number of variants increase. These factors provided a further rationale for the standardisation achieved through the SLI. As skills develop, it allows for a deeper and wider level of support for the preferred devices, whilst not disenfranchising students who bring other laptop technology. Thus the benefits above can be achieved in an environment where resource is traditionally constrained.

The sense of the above approach is highlighted through the results of the survey work undertaken by the SLI team. General laptop ownership has increased year on year to the point where it is estimated there are over 4,500 on campus. Well over half of these are SLI purchases, allowing for the provision of a high service level. Purchases outside the initiative have also risen as societal influences and expectations influence our customer base. From University survey results, the value attributed by students to such technologies is clearly growing, both at the wider societal perspective and teaching and learning, (see Figure 2 below).

The emergence of other technologies (e.g. mobile telephones, MP3 players, PDAs) has lead to a number of models for mobile learning. A 2005 SLI survey of 356 laptop-using students showed 90% of students would still wish to use a laptop in University even if they were able to read e-mail, surf the web and use a cut down version of Office on another mobile device. Although it may be a number of years before the current era of experimentation resolves to a number of stable models, it is clear that the requirement for fixed-place student computing is likely to reduce in the future. A 2005/06 SLI survey of 350 post-graduate students in a mandatory laptop course found that 81% of them never or rarely used fixed-place computing labs in their studies. A number of American institutions have found that they have been able to reduce the size of their fixed place provision and have migrated them to be specialised machines for such activities as CAD. This is the current point of debate at Strathclyde.

Although the SLI focussed on laptop computers, the benefits derived from this technology was dependent on a concurrent enhancement of the institution's wireless network, which was expanded beyond a number of teaching areas to cover areas such as the University Library, the Students' Union and refectories. The SLI has been a major driver for the University

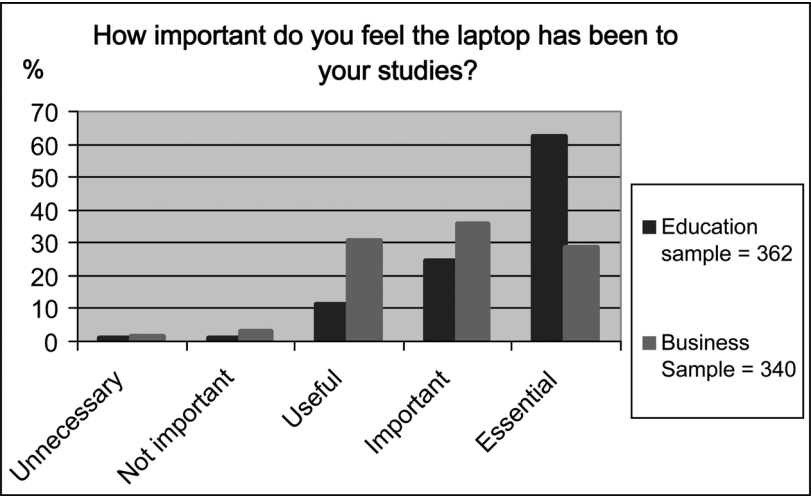


Figure 2: Mandatory class students at the end of the 2005/06 academic year rate the importance of the laptop.

both in terms of the adoption of wireless and also its continued expansion across the campus. Currently, Strathclyde has one of the most wireless enabled campuses in the United Kingdom, with well over 150 wireless hotspots across both social and teaching areas and plans for continued development of these services.

8. Organisation structures

Organisational structures within the University of Strathclyde were a key element in facilitating the SLI and were, in turn, affected by the requirements of the SLI.

Part of the University's institutional strategy for 1998–2005 involved the consolidation of a number of 'information support' departments and functions under the umbrella of the 'Information Resources Directorate' (IRD) under a newly appointed director. This consolidated structure facilitated a greater level of initial funding, and senior support for the SLI then may have been possible under the previously compartmentalised structure. Furthermore, the role of Head of IRD was a permanent position unlike many of the other senior management positions within the institution, which provided continuity of support for the project at the most senior levels.

Prior to implementation a project team was put in place to manage the initiative. This was headed by the Head of User Services within the IT Services Department and also crucially included a member of academic staff from the Business Faculty. At this point a change was also implemented with regard to the reporting structure, in that for the SLI, the Head of the User Services reported to the Director of the IRD. This decision was taken as the new project did not sit comfortably within the confines of the IT Department, and it was clear that a number of areas within the newly formed Directorate could be affected by its inception.

However, operation of the SLI does require staff and resources from User Services and it is fair to say that some tension has arisen over the duality of this situation. At an operational level the SLI, as it expanded, has had an increasing impact on the extant IT support structures. The Head of the SLI has a dual responsibility to both expand the initiative but also ensure that the support services are not over-stretched. This has been accomplished through close consultation with User Services colleagues and also firm adherence to the principle that the integrity of the overall support services has precedence over any one initiative.

The cross-functional nature of the project team undoubtedly contributed to the successful implementation in September 2000 by engendering joint ownership and facilitating the speedy resolution of issues as they arose. Although high-level support has been crucial, much effort has been placed in gaining grassroots support through a collaborative approach to development and implementation. A collegiate environment demands careful consideration of the stakeholders in any area, and the multidisciplinary nature of the project team has been crucial in addressing this.

9. Individuals and roles

Any project of this type requires both ‘champions’ amongst senior staff, to promote the initiative and to navigate a course through the often complex decision-making processes within HEIs, and commitment from the staff actually charged with managing and implementing the process. Having embarked upon the project in the Spring of 2000, the date for initial implementation was set for September 2000. With such tight timescales the commitment of several key individuals was crucial.

Firstly the Director and Deputy Director of the University’s Information Resources Directorate (IRD) helped to define the project and committed the IRD to providing funding and technical support for the project. Secondly, the commitment of the participating class teaching team and the course leader for the IC class ensured that the institution, in addition to piloting the technology, was also piloting its integration into teaching and learning.

The student response to the laptop initiative has been positive. The figures for the IC class (now called the Management Development Program and the longest running of the ‘mandatory’ laptop classes) are shown in Table 2. The table shows a consistent increase in the percentage of students purchasing a laptop and a corresponding drop in the number of laptops that the University has to purchase and loan to students. The slight reversal in this trend in 2004/05 coincided, according to IBM, with a worldwide plateau in laptop sales caused by economic factors such as a rise in interest rates. This is an example of how external factors continue to affect the development of the SLI.

Table 3 shows the percentages of students who own a laptop in two faculties within the institution. The impact of the ‘mandatory’ class in the Business faculty clearly encourages greater laptop ownership than in

Year	No of students in class	Purchased (%)	Loans (%)
2001/2002	510	28	72
2002/2003	480	49	51
2003/2004	467	73	27
2004/2005	532	66	34
2005/2006	476	67	33
2006/2007	578	84	16

Table 2: Sources of student laptops in 1st year business faculty.

UG level	Business faculty (%)	Education faculty (%)
1st	95 ^a	52
2nd	85	62
3rd	85	58
4th	79	48

^aIncludes loans through IC Class.

Table 3: Percentage Laptop Ownership in 2006/07.

the Education faculty, even though the curriculum of many students in the Education faculty (e.g. teacher training placements in schools) might encourage them to acquire mobile technologies.

In the early years of the SLI, proactive steps were taken to expose students to the benefits of laptop usage. For example, the University funded the operation of two pools of loan laptops. Each of the University's two libraries held a group of fully-configured devices that students could borrow for up to 2 hours. Although the devices had to remain within the Library, they could be taken to any point within a secure area. This scheme received very positive feedback. However, as awareness of laptop technologies grew within the student population, this outgrew its usefulness as it dissuaded some students from purchasing a laptop of their own. Ultimately, the scheme lapsed when the laptops needed renewal.

10. Management processes

The project team put in place an organisational model that could respond quickly to market forces. In the early years of the project the market was untested, and although students were asked for their anticipated actions, it was unclear how many students would actually opt to buy laptops and consequently, how many laptops the institution would have to buy to support a loan pool for the 'mandatory' laptop classes. This responsive business model was based on continually updated information on student numbers and purchasing patterns flowing from across the institution (e.g. from the Business School itself, the Finance Office, the Student Registry) to the project team, and from the project team to the suppliers.

An existing University committee (the University's 'Hub' committee which contained representatives of all relevant stakeholders) acted as the Project Steering Committee. The project team has reported to the Hub Committee at least annually, and more frequently when required. This reporting arrangement is indicative of the high degree of autonomy afforded the project team and the concurrent responsibility for success that rested on their shoulders.

11. Contrasting cultures

The MIT90s model (Figure 1 above) suggests that the institutional culture is a product of its structure, management processes and its individual stakeholders and their roles. However in devolved, collegiate organisations, such as the University of Strathclyde, multiple cultures can co-exist. Consequently, fostering and facilitating change across the institution required the project team to recognise the differences in culture that exist and then to adapt their approach as appropriate. Two of the SLI's pilot implementations provide an example of this.

The University of Strathclyde has two campuses, the John Anderson campus in Glasgow City Centre and the Jordanhill campus, some 6 miles away, which is primarily the home of the University's Education Faculty and was formerly a teaching training college prior to the merger of the two

institutions in 1993. This distinct history means that departments in the Education Faculty, in general, don't exhibit the highly devolved, collegiate culture to the same extent as, for example, departments in the Business School.

These different cultures and separate locations have a number of implications for a change project such as the SLI implementation. For example, in terms of management processes, there was less debate over the validity of SLI proposals amongst the staff in the Education Faculty than in the Business School, where more resources had to be applied to 'selling' proposed changes to individuals. This could be attributed to the less collegiate culture within the Education faculty where top-down initiatives are more readily accepted.

In the Business Faculty the seed-funding for the scheme was provided from internal sources, with the expectation that on-going funding would be provided by the faculty once the laptops required replacement. In contrast, the Education Faculty drew upon existing direct links to the Scottish Executive Education Department to seed-fund their initiative.

The students in the Education Faculty are post-graduate trainee primary school teachers, using their laptops both in the learning context and in their work placements throughout their course. This contrasts with the undergraduate students in the Business School, who typically only bring their laptops onto campus when they are required to.

The Education Faculty student use of their laptops on placement raises unique support issues. In Semester 1 of the 2005/06, 73% of the students were regularly using their laptops while on placement in schools – environments for which the laptops are neither configured nor supported.

Figure 3 below shows that the majority of Education Faculty students bring their laptops onto campus 3 days per week (the maximum number

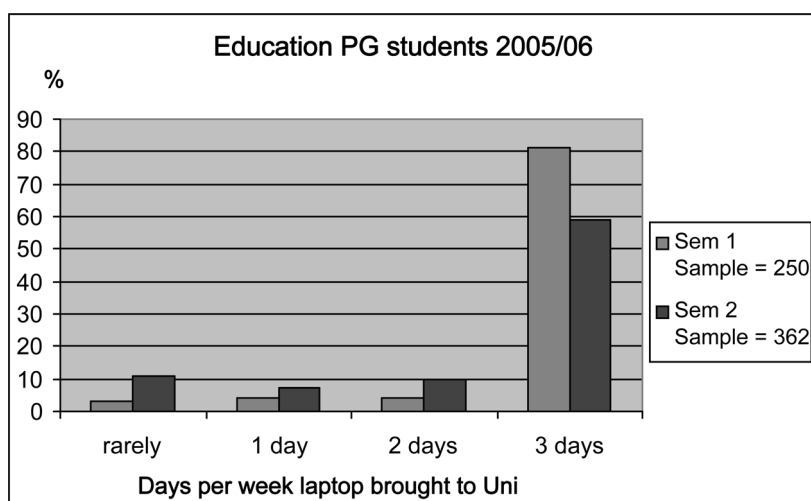


Figure 3: Education faculty laptop usage.

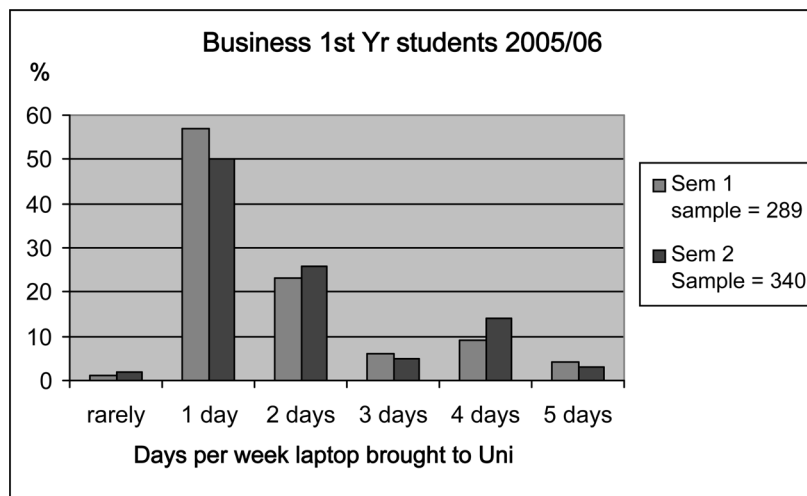


Figure 4: Business faculty laptop usage.

of days that they are on campus). This contrasts with the figures for the Business faculty (shown in Figure 4) where students tend to bring the laptop to the campus when it is required, typically 1–2 days per week.

12. Issues for the future

Although the SLI continues to run successfully at the University of Strathclyde, it is not yet fully embedded and, in many respects still operates in ‘project’ (as opposed to ‘service’) mode. For example the support team still report through a *de facto* steering group, rather than through the institution’s hierarchical reporting structure, and central funding for the initiative is still subject to annual review. This is indicative of the fact that, despite the initiative having been in place for 6 years, there are still issues that are not yet fully resolved or fully mature.

Firstly, a simple cost/benefit model cannot be promoted across the institution. The value that the department and the students derive from a ‘mandatory’ laptop scheme will vary depending on the pedagogical approach that is used. Likewise the costs will vary depending on the number of ‘loan’ laptops that the department themselves have to purchase.

A second and related point is that laptop ownership is rising amongst the student population as technology prices continue to fall. More students are purchasing laptop computers during their school rather than university years, affecting the attractiveness of SLI to incoming first year students.

Finally, in England, if not Scotland, the introduction of top-up fees has forced HEIs to think in more commercial terms about their pricing policies. A number of institutions have included a standard laptop as part of their offering to incoming students. Will student expectations change if this type of offering becomes prevalent?

SLI has an unusually high commercial profile in comparison to many activities within the University. 2007 brings a specific challenge as Microsoft releases their new VISTA operating system. As SLI laptops go on sale in academic year 2007/8, if they are to be commercially attractive they must be VISTA loaded and academic software must be configured to utilise this environment. This is in contrast to the University central population, which will utilise VISTA at the very earliest in summer 2008. In order to ensure that laptop users who purchased outside the SLI are not disenfranchised, significant technical effort is undertaken by the SLI team to construct effective technical processes to load required software packages to these laptops. Though this comes with no guarantee of functionality, it is extremely successful. Whilst benefits will accrue to the University through the experience of the SLI team being passed to other colleagues, this exemplifies the way in which the SLI continues to involve a higher degree of risk than other models of student computing because of the impact of external market forces.

13. Conclusions

The experience of the SLI has shown that HEIs who wish to differentiate themselves through their use of such technology have important factors to consider. Operationally, they have to prepare to move quickly in order to satisfy the commercial requirements of their customers and ensure that supply chain partners are similarly able. Strategically, given that major technological changes can often only be implemented at the beginning of an academic year, institutions may be forced to decide to either be an early adopter, and bear the associated risk, or wait for one or two years, losing potential advantage but learning from the experience of others.

Having opted to be an early adopter, the SLI managed to put in place a flexible, responsive and student-centred service in a relatively short period of time, but this was dependent on several key factors. The project team were given a reasonable degree of autonomy within which to operate but were supported at senior management levels. The relationship between the project team and those with a governance remit was reinforced by the regular, robust and evidence-based reporting by the team to those tasked with governing the project.

Whether true differentiation in the market place (i.e. the annual cohort of school leavers applying to universities) was achieved is a moot point. The factors that influence choice of institution and course are too complex to suggest a simplistic cause and effect relationship. Nevertheless the SLI appears to have contributed positively to retention rates within the IC class which is amongst the best in the institution.

Works cited

Belton, V., Johnston, B. and Walls, L. (2001), 'Developing Key Skills at Strathclyde Business School through the Integrative Core', *Innovations in Teaching Business and Management* (SEDA) 111, pp. 75–86.

- Coen, M. and Nicol, D. (2007), 'Managing Investment in Teaching and Learning Technologies', *Perspectives: Policy and Practice in Higher Education*, 11: 1, pp. 25–28.
- Dearing, R. et al. (1997), *Report of the National Committee of Enquiry into Higher Education*, London: HSMO.
- Golightly, M. (2000), 'Narrowing the Gap', *Australian CPA*, 70: 7, pp. 48–49.
- Land, R. (2004), *Educational Development: Discourse, Identity and Practice*, Milton Keynes: Society for Research into Higher Education and the Open University Press.
- Sargeant, D. and Svec, A. (2003), 'University of Minnesota: Crookston: It's the Right Thing to Do – A Success Story', in Brown, D.G. (ed.), *Ubiquitous Computing: The Universal Use of Computers on College Campuses*, Bolton, MA: Anker Publishing Company, Chapter 6, pp. 88–103.
- Scott Morton, M.S. (1991), *The Corporation of the 1990s: Information Technology and Organisational Transformation*, New York: Oxford University Press.
- Thornbury, H., Law, D. and Henderson, B. (2003), 'Case Study: The University of Strathclyde in Glasgow', in Brown, D.G. (ed.), *Ubiquitous Computing: The Universal Use of Computers on College Campuses*, Bolton, MA: Anker Publishing Company, pp. 71–87.
- UK Government Report (1998), *Higher Education for the 21st Century: Response to the Dearing Report*. <http://www.lifelonglearning.dfee.gov.uk/dearing/index.htm>. Accessed 19 January 2007.
- University of Strathclyde (2007), *Draft Strategic Plan 2007–2011*, Glasgow, Scotland: University of Strathclyde.
- Wojtas, O. (2005), 'Strathclyde: Best Overall', *Times Higher Education Supplement*, 17 June 2005.
- Yetton, P. (1997), *Managing the Introduction of Technology in the Delivery and Administration of Higher Education*, Department of Employment, Education, Training and Youth Affairs, Australia. <http://www.dest.gov.au/archive/highered/eipubs/eip9703/front.htm>. Accessed 29 January 2007.

Suggested citation

- Coen, M., Gould, H. & Henderson, B. (2007), 'Laptops for students: Understanding and evaluating the drivers for change', *Journal of Organisational Transformation and Social Change* 4: 1, pp. 39–55, doi: 10.1386/jots.4.1.39/1

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