Experiencing the 'smarter' campus

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1. SUMMARY

It seems that every few years a new development (usually featuring technology), be it online learning or, more recently, MOOCs, heralds the 'death of the university campus'. The physical evidence however always appears to contradict these predictions. Campus education continues to be relevant because learning is a social process but the nature of the facilities we need to provide is changing significantly.

This paper looks at trends in the use of digital technologies on-campus and the organisational and management issues they pose. We concentrate primarily on the use of such technologies in spaces used for formal and informal learning and teaching. The paper makes the case that successful integration of digital technology is key to delivering excellent learning experiences on campus and we make recommendations as to how the EUNIS community can take steps to help develop smarter campuses in their own institutions.

The authors are professionals who have supported a range of different universities in various aspects of learning space development. In the Congress presentation that accompanies this paper we illustrate the points with worldwide examples.

2. INTRODUCTION

It seems that every few years a new development (usually featuring technology), be it online learning or, more recently, MOOCs, heralds the 'death of the university campus'. The physical evidence however always appears to contradict these predictions. Universities across the world are investing as much as ever in the physical estate and even virtual providers such as Coursera have been moved to develop physical learning hubs. Campus education continues to be relevant because learning is a social process but the nature of the facilities we need to provide is changing significantly.

Digital technology is now all pervasive in universities. There is no aspect of learning, teaching, research, administration or campus management that does not rely on IT systems. The challenge now is to make these systems work seamlessly together so that we truly develop 'smarter campuses'.

'What do we mean by the 'smarter campus'? Words such as smart, responsive and intelligent are often used interchangeably and mean many different things to many people. In its widest sense the term smarter campus encompasses a range of technologies supporting many different business functions relating to building management, environmental and access controls and monitoring and tracking of activity. The terminology smart and intelligent when applied to buildings often means a focus on efficiency. In the case of universities we are also beginning to look at how the application of technology can make the people on the campus behave in smarter, more intelligent ways.

To address the topic fully would require consideration of how the Internet of Things, artificial intelligence and learning analytics might impact on our day to day activities. For the purpose of this short paper and accompanying presentation, we have decided to focus on the use of digital technologies in spaces used for formal and informal learning and teaching because these are issues that are important to all universities right now. They are also issues that are already blurring the boundaries between different professional services in universities and, importantly for the EUNIS

audience, involving IT services in projects where some of the technologies and standards may be unfamiliar. This paper therefore looks at trends in the use of technology on-campus and the organisational and management issues they pose, concentrating primarily on spaces used for formal and informal learning and teaching. In the Congress presentation that accompanies this paper we illustrate the points with worldwide examples.

In the UK there is an increasing focus on what is termed the 'student experience'. The term pops up in mission statements, strategies and job titles of senior posts. Whilst the quality of learning and teaching is paramount, the quality of on campus facilities has an important role to play in defining the student experience. What today's students want to experience is a fully integrated, digitally enabled environment where multimedia and immersive environments are as much a feature of learning as our beloved books.

'By elevating experience over technology, innovative higher education institutions create the advanced learning environment that attracts the best students and helps them to achieve their full potential.' (infoComm 2017)

Digital is the new norm in many areas of our lives and this is equally true of pedagogic practice. There is now good evidence that the use of digital tools makes for active and engaged students and enhances their ability to learn. This has major implications for how we design formal learning spaces such as classrooms and lecture theatres. It is no longer sufficient that 'consumers of information' can see and hear adequately in the spaces. Students and researchers now want to interact, modify and share information and engage with wider learning communities using digital tools. The convergence of the physical and virtual environments is an important trend as is designing campuses where a continuous flow of formal and informal learning can take place.

3. LIBRARIES AND LEARNING CENTRES

In the digital age access to *information* is no longer a reason to bring students to campus thus the continued importance of physical learning spaces lies in them being able to support learning activities that cannot happen in other ways.

The trend towards new types of learning space supporting socio-constructivist pedagogies, such as active, enquiry-based or problem-based learning, began in the late 1990s and the early years of the new millennium with the development of new types of library and learning resource centres. There are now many excellent examples of libraries and learning centres that provide students with easy access to all the resources they need. Resources are available (physically and virtually) 24x7; ubiquitous wifi makes it possible for students to use resources and collaborate with peers on their own devices (laptops, smartphones etc) and there are university devices for those who do not have their own equipment. The environment is comfortable and welcoming with a variety of work spaces to meet different needs - silent study, collaborative group work etc. Food and drink are readily available and a lot of informal learning takes place in the social spaces.

Libraries and learning centres have led the way in creating new types of learning environment and many other parts of the campus have been slower to catch up. In the Congress presentation that accompanies this paper we will however look at some excellent examples of where the use of technology has enabled new types of learning experience.

4. FORMAL TEACHING SPACES

The design of many lecture theatres and classrooms has changed little over centuries. The layout assumes a *transmission* model i.e. one person will transfer information to others, who will all absorb it at the same rate, by focusing on the person at the front. One reason the lecture has survived both the invention of the printing press and the computer, is that the built environment makes it difficult to teach in any other way. The way in which space is designed shapes the learning that takes place. We need to rethink the types of learning students undertake in these collective situations.

Increasingly mobile and affordable technology offers new possibilities to design types of learning activity that encourage students to create as well as consume learning resources and to collaborate in new ways. Convergence of the physical and virtual is a significant theme in new learning space developments.

Traditional lecture theatres remain useful for teaching large cohorts and they are being adapted to new teaching practices e.g. the introduction of swivel-seating to allow students to turn and work in groups and the use of technologies such as personal response systems to allow interaction between students and lecturer. Lecture capture is enabling developments such as *flipped classroom* where students listen to the lecture in advance and use the face to face time for interactivity with the tutor.

Classrooms are being fitted with lightweight furniture that can be easily reconfigured to support group working and low-tech solutions such as writable walls are very effective in supporting collaboration. Digital technologies can also help increase the flexibility of the space as light, sound and projection can create a different ambience at different times.

Changing traditional teaching practice is less easy and academics may need support to help them work in different ways. It can be uncomfortable to teach in an innovative group space without a clear idea where is the *front* of the class. Many lecturers fear that lecture capture means students will no longer attend class although evidence suggests interactive lectures are well-attended. Students may also need help to adapt to a less passive role.

5. ENHANCING EMPLOYABILITY

The trend in the UK towards high tuition fees (funded by student loans which have to be repaid) has focused attention very firmly on the practical benefits of higher education in terms of future career prospects. Student employability is however an important theme across the rest of Europe as well. Business leaders are clear about the kind of attributes they want to see in graduates from higher education: analysis and problem solving, collaboration and teamwork, business-context communication, along with flexibility, agility and adaptability. These are precisely the type of attributes that active learning approaches can foster.

Many leading universities place great emphasis on having state of the art technologies that mirror those used in business and the presentation that accompanies this paper will illustrate some examples of this. The integration of innovative AV experiences is an important factor in preparing graduates for the real working environments they will experience.

Physical space can promote better learning but we also need to design learning *activities* that give students the problem solving skills needed for employment. An example is scientific disciplines moving away from *recipe based* experiments (following a formula to achieve a known outcome) and encouraging students to design their own experiments to solve problems. Technology has a role to play e.g. games/simulations can develop problem solving and communication skills as students can make mistakes, free from consequences and failure is a recognised and accepted part of the learning process.

6. OTHER LEARNING SPACES

Ubiquitous technology means that just about any space on campus can become a learning space. The issue of creating a physical environment conducive to learning therefore extends beyond formal teaching space to other areas. Students spend a lot of time *hanging around* so equipping circulation space to facilitate self-directed learning is important. Otherwise such spaces simply reinforce the message that students do not learn until they move into formal learning space with a tutor present.

Digital signage is increasingly important on campus and audiovisual displays in public areas help generate a buzz by being informative, entertaining and helping create a sense of community.

7. FUTURE DIRECTIONS

The use of simulations and gaming type environments in education has been around for many years. Some of the best examples in the UK occur in vocational education.

PROCAT uses virtual reality (VR) in its electrical training for apprentices. A simulated environment allows the apprentice to move around a house. If they fail to observe required safety protocols when carrying out a task, the VR goes off with a bang without risk to the apprentice. Tutors find that apprentices learn more quickly when they can be allowed to make mistakes. PROCAT is also implementing VR in plumbing and construction and cybergloves in hairdressing.

By using virtual and augmented reality, S&B Automotive Academy has reduced the time allocated to training apprentices in paint spraying techniques and made cost savings of at least £13,000 per annum in terms of teacher time and consumables such as paint. Read the case study.

Higher education institutions are now beginning to show increasing interest in the application of virtual and augmented reality on campus e.g. the University of Exeter already has an augmented reality campus tour.

With the tools to support virtual and augmented reality ranging from highly sophisticated simulations to smart phone apps and Google cardboard we can expect to see greater use of these types of AV technologies in many situations in future.

8. IMPLICATIONS FOR IT AND SUPPORT SERVICES

The richer the digital environment becomes the more boundaries between the different professional support services in universities become blurred. Whereas AV and IT used to be very separate functions there is now considerable convergence. This convergence occurs in terms of infrastructure as the more facilities go digital the more demands they place on the network. BYOD is an area where what is possible using digital tools and devices needs to be carefully handled in relation to what represents good practice in network management.

We are also seeing increased convergence in terms of teams and roles. There is a, fairly understandable, tendency for senior managers to see that digital is the way forward for AV facilities and therefore assume that the function can simply be rolled into existing IT support. This is a somewhat shortsighted view that underestimates the amount of specialist knowledge required to get the best from digital AV and create an outstanding on-campus learning experience.

The picture is further complicated by 'smart campus' technologies that extend into the estate management domain such as digital signage, access control and building management services such as environmental controls.

Close collaboration between AV, networking teams and other support services is certainly needed. Often there are significant change management aspects to creating new service delivery teams. It is also not uncommon for different professional services to come into conflict over campus development projects.

'*Often, AV people see the network people as the people with the firewalls and the rules that stop their cool gizmos working, and networking see AV as having unmanaged devices with no authentication that break their security policies.*' (SCHOMS *et al* 2016)

Some institutions are taking the approach of situating responsibility for all digital devices within IT services and extending training for IT staff to encompass more audiovisual expertise.

In many European countries there are different professional associations representing AV and IT staff (often with yet another association for learning technologists) so that a broad organisation such as EUNIS can provide a useful forum for debate, exchange and updating across the full range of relevant services.

9. THE IMPORTANCE OF STANDARDS

IT people are generally knowledgeable about the existence, and importance, of standards in their own area of work. Discussions within the EUNIS community however indicate less general awareness about the range of design standards relating to AV technologies (and discussion with AV industry profesionals suggests that standards are indeed less established and developed than in many other industries).

InfoComm is the trade association for the AV industry worldwide and, as an accredited standards developer, it sets the standards for the industry. InfoComm works closely with the AV professional associations in higher education in many parts of the English-speaking world and it appears as though greater awareness of its role would benefit the EUNIS community. The references section of this paper includes links to some of the InfoComm guidance that is freely available to the higher education sector.

10.   MANAGING A LEARNING SPACE PROJECT

Many learning space projects tend to go through their own version of the Gartner hype cycle that is to say initial ideas lead to inflated expectations that ultimately descend into the trough of budgetary disillusionment.

There are various reasons why this type of situation occurs so frequently and many of them relate to the relationship of AV and IT with projects that are often led by other parts of the institution. The two key issues are:

- AV and IT professionals are not brought into discussions sufficiently early in the project and often major design decisions have been made before they hear about it.

- Budget overruns are common and when this happens project leads often look to make savings on AV and IT equipment that is installed in the later part of the project life cycle.

The UK Higher Education Learning Space Toolkit (SCHOMS *et al* 2016) contains some very good guidance on managing learning space projects. It looks at topics such as:

- bringing the right people to the table from an early stage;

- techniques to aid both creative thinking and practical requirements definition;

- transitioning to new ways of working and evaluating their success.

Every learning space project is unique; there is no template that will apply to all situations but by taking inspiration from elsewhere, involving the right people and following good practice guidance you can deliver innovative solutions that will improve learning and teaching in your university.

11.   RECOMMENDATIONS

This paper makes the case that successful integration of digital technology is key to delivering excellent learning experiences on campus and we have the following recommendations to make to the EUNIS community:

- Be proactive in suggesting the benefits that a smarter, more digitally enabled campus can bring to your institution. To do this it helps to be aware of developments elsewhere including seeking out the very best examples on a worldwide scale.

- Recognise the full range of professional skills needed to deliver successful outcomes and try to achieve the right blend of IT and AV skills in your support teams.

- Recognise the importance of design standards in both AV and IT areas and seek to implement good practice by following recognised standards across your campus.

- Make good use of links to professional associations and authoritative guidance materials to keep your staff up-to-date in this rapidly changing area. The sources mentioned in the references section of this paper are a good starting point.

12.   REFERENCES

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13.   AUTHORS' BIOGRAPHIES

Gill has teaching and research experience and has held senior management positions in a number of university administrative functions as well as directing a UK support service enhancing the use of ICT in further and higher education. She acts as a consultant to universities and national agencies in both the UK and Europe and has been an invited speaker at many national and international events. Current interests include: data and information management, technology enhanced learning, assessment and feedback and learning space design.

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Chris Lavelle studied sound engineering in the late nineties while doing freelance work in the audio industry. He studied IT and became a freelance web developer in 2001. Lavelle focused on the property development web portal market specialising in CAD drawings online. As IT started to be used more in the production and presentation industries, Lavelle returned to what he enjoyed most, audio and video communications. After managing event and ICT technology at London's Claridge's Hotel for PSAV Presentation Services for five years, Lavelle went on to become Director of Event Technology at PSAV for the Maybourne Hotel Group, and ultimately joining InfoComm International ® as Regional Manager for the UK and Ireland. Now in his ninth year at InfoComm, Lavelle holds the position of Regional Director for the region. InfoComm is the international association representing the professional audiovisual and communications industries.

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