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Original Citation

Amaratunga, Dilanthi, Thayaparan, Menaha and Malalgoda, Chamindi (2012) Bellcurve: Built Environment Lifelong Learning Challenging University Responses to Vocational Education: Lifelong University for the Built Environment. Project Report. University of Salford, Salford, UK.

This version is available at http://eprints.hud.ac.uk/id/eprint/25616/

BELLCURVE

(Built Environment Lifelong Learning Challenging University Responses to Vocational Education)

Lifelong University for the Built Environment

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Executive Summary

This report provides recommendations for the higher education institutions to become continuing education centres while adequately responding to the labour market skills needs, based on a 28 month collaborative research project, which was partly funded by European Commission under the ERASMUS multilateral modernisation of higher education agenda.

The recommendations were made in order to enhance effective responses to industry requirements; facilitate lifelong learning via through-life studentship; promote to adopt, diffuse and exploit latest learning and teaching technologies and to encourage close collaboration between higher education institutions (HEIs), industries, professional bodies and communities and policy level changes.

1. Built Environment Lifelong Learning Challenging University Responses to Vocational Education (BELLCUREVE)

BELLCURVE (Built Environment Lifelong Learning Challenging University Responses to Vocational Education) is a European Commission funded research project conducted at the School of the Built Environment, University of Salford, UK, in collaboration with Department of Construction Economics and Property Management, Vilnius Gediminas Technical University, Lithuania and Department of Building Production, Tallinn University of Technology, Estonia.

This project addressed issues associated with the mismatch between graduate skills and labour market requirements as this mismatch has been identified as one of the main factors behind graduate unemployment and employer dissatisfaction, particularly in the Built Environment (BE) sector. BELLCURVE considered 'student engagement' as a continuous through-life process rather than a temporary traditional engagement limited by the course duration. This through-life studentship defines the essence of the new innovative "Lifelong University" concept, whereby providing an opportunity for learners to acquire and develop skills and knowledge enabling responds to changing construction labour market needs on a continuous basis. This requires a reform in governance systems to respond labour market needs effectively while promoting the lifelong learning agenda.

Thus, BELLCURVE aimed to promote the concept of 'lifelong university' in modernising Higher Education Institutes (HEI) to be more responsive to labour market skills needs. The objectives of this project were formulated as, to develop a framework for HEI's to promote the concept of lifelong university in capturing and responding to labour market skill needs in the Built Environment; to refine, test and validate the developed framework through built environment sectors; to provide recommendations on governance reforms for HEIs to become 'continuing education centres' for graduates while responding to labour market skill needs.

Objectives of the project were achieved through five Work Packages (WP's) led by different partner institutions. The work programme were synchronised with the work packages. The details of the work packages of the project are indicated in Figure 1.
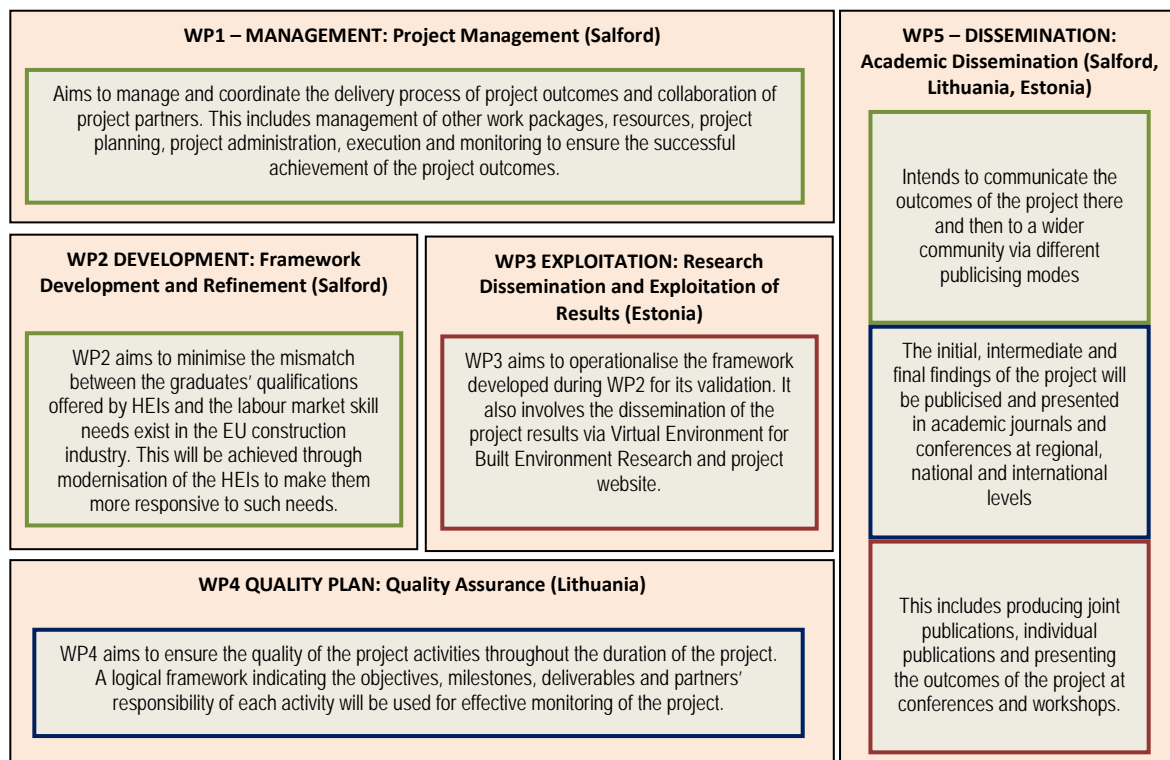

WP1 – MANAGEMENT: Project Management (Salford)

Aims to manage and coordinate the delivery process of project outcomes and collaboration of project partners. This includes management of other work packages, resources, project planning, project administration, execution and monitoring to ensure the successful achievement of the project outcomes.

WP2 DEVELOPMENT: Framework Development and Refinement (Salford)

WP2 aims to minimise the mismatch between the graduates' qualifications offered by HEIs and the labour market skill needs exist in the EU construction industry. This will be achieved through modernisation of the HEIs to make them more responsive to such needs.

WP3 EXPLOITATION: Research Dissemination and Exploitation of Results (Estonia)

WP3 aims to operationalise the framework developed during WP2 for its validation. It also involves the dissemination of the project results via Virtual Environment for Built Environment Research and project website.

WP4 QUALITY PLAN: Quality Assurance (Lithuania)

WP4 aims to ensure the quality of the project activities throughout the duration of the project. A logical framework indicating the objectives, milestones, deliverables and partners' responsibility of each activity will be used for effective monitoring of the project.

WP5 – DISSEMINATION: Academic Dissemination (Salford, Lithuania, Estonia)

Intends to communicate the outcomes of the project there and then to a wider community via different publicising modes

The initial, intermediate and final findings of the project will be publicised and presented in academic journals and conferences at regional, national and international levels

This includes producing joint publications, individual publications and presenting the outcomes of the project at conferences and workshops.

Figure 1: BELLCURVE work packages

Two principal themes were identified: 'skills matching' and 'lifelong learning' and these were further broken down into a series of sub-themes and thereafter into survey questions or interview guidelines as appropriate for each specific stakeholder. Intention of this process was that as many as possible of the stakeholders to be surveyed with respect to the two identified themes.

Modes of empirical data collection varied from questionnaire surveys through interviews, expert opinion surveys, workshops, documentary reviews and to formal and informal discussions. The literature review also formed part of data collection methods.

Case studies were conducted on four built environment sectors to validate the different aspects of the framework using different sector based case studies. Four built environment sectors were studies where quantity surveying (QS) and disaster management (DM) sectors were dealt with by University of Salford, UK and civil engineering (CE) and construction management (CM) sectors were focused by Vilnius Gediminas Technical University, Lithuania and Tallinn University of Technology, Estonia. For QS and DM sectors, the case studies data collection was largely based on workshops and expert interviews whereas for CE and CM sectors it was based on student and graduate questionnaire survey.

2. BELLCURVE framework

BELLCURVE framework consists of three components such as strategic directions that explain the research problem, the pathway to achieve the solution and the expected outcomes; framework of understanding that discusses the knowledge associated with the subject areas, especially the major obstacles in addressing skills requirements and in incorporating lifelong learning approach within higher education system; and good practice guidelines which provide recommendations to make higher education institutions more responsive to labour market skills needs.

2.1 Strategic directions

The mismatch between graduate skills and labour market requirements is one of the main problems behind graduate unemployment and employer dissatisfaction, particularly in the Built Environment (BE) sector (OECD, 2008). Reducing the mismatch between the supply of skills and the skills demand is the major challenge most of the higher education institutions are now facing. Due to the dynamic and competitive nature of the construction labour market, individuals are expected to increase their employability skills to enter the labour market as recruitment of qualified human resources is highly competitive.

In solving the identified problem of mismatch in the labour market, the pathway for the solutions was identified through expert interviews. Due to the dynamic nature of the industry the employers mainly seek those with good degree level qualifications; specific skills; generic or transferable skills; experience; and personal attributes (Gilleard, 2010) when recruiting employees to their organisations. This demands employees to develop a capacity to update their knowledge and skills on a continuous basis. Lifelong learning has been highlighted as the most appropriate approach to facilitate the continuous knowledge update. Thus the pathway was chosen as a reform in higher education governance in making them more responsive to the labour market skills needs by allowing a systematic incorporation of lifelong learning model within higher education institutions.

Having adopted this pathway explained above as a way to address the problem, the expected outcomes can be reduced mismatches between the graduate skills and labour market requirements; through-life studentship; lifelong learning to built environment professionals; and make higher education institutions as 'lifelong universities'.

2.2 Framework of understanding

Built environment requires a diverse range of professionals and therefore education and training of such professionals is a major aim of most built environment educational programmes in higher education institutions (HEIs). The dynamic nature of the construction labour market requires employees to possess and be able to demonstrate a range of skills in order for them to retain in their jobs. It demands the employees to improve their skills and acquire new skills. Further, the changing nature of the labour market and introduction of new technologies has also led the employees with no option but to enhance their skills. This can be achieved through training and development activities.

Construction labour market, due to its labour-intensive, multi-disciplinary and highly fragmented nature, relies highly on the skills and competencies of its workforce. As it involves workers with various disciplinary backgrounds, the industry uses a wide range of technical and managerial skills. The labour market requirements of the construction industry are of dynamic nature, changing from time to time, due to various factors such as demographic decline in the number of people entering the labour market; the changing and fluctuating nature of the market and the related decline in the operative skills; the introduction of the new technologies; the growth in

self employment and the use of specialist and labour only sub contractors; the fragmentation of the industry; the decline in the training and related resources; the changes in the industrial structure, wastage rates and industrial competition; and considerable market expansion (Dainty et. al., 2005).

Due to the dynamic factors discussed above, individuals are expected to increase their employability skills to ensure their survival in the labour market. The employability skills includes the ability to gain initial employment; the ability to maintain employment; ability to meet new job requirements; ability to make transitions between jobs and roles within the same organisation; and the ability to obtain new employment if required (Hillage & Pollard, 1998). By nature, the role of the built environment professionals is very complex and changing from time to time. According to Inalhan (2002) the built environment students and practitioners are working in demanding, challenging and competitive environments and they are required to balance their technical, human and conceptual skills while understanding the broader idea about the overall industry without limiting their skills to one profession.

As highlighted in the strategic directions lifelong learning is an approach to enhance the knowledge and skills of the built environment professional to make them more responsive to the industry needs. The learning process can mainly contain 3 classified elements namely formal, informal and non-formal learning. In short, formal learning is achieved through organised programmes delivered through schools and other providers and is recognised through a qualification or part of a qualification; non-formal learning is achieved through an organised programme or instruction, but is not recognised through a qualification; and informal learning is achieved outside of organised provision (OECD, 2004). Lifelong learning generally includes all of these three elements in its learning system. OECD (2003) defines lifelong learning as "all learning activity undertaken throughout life, with the aim of improving knowledge, skills and competences within a personal, civic, social and/or employment-related perspective". In this context the guidelines for higher education reform are focused on incorporating the lifelong learning approach within the institutionalised based higher education system.

HEIs being one of the major education providers are expected to respond promptly to industry skill needs. However, the research identified various challenges for addressing skills requirements and incorporating lifelong learning within higher education system. Such challenges are discussed below. The recommendations are provided in such a way so that one or more of the identified challenges can be addressed.

Major challenges for addressing skills requirements and for incorporating lifelong learning approach within the higher education system

Construction industry is diverse and its requirements are varied based on different scenarios. The diverse nature of the construction industry makes it impractical for the industry to have a single voice on their skills and labour requirements. Thus, it is a challenge for HEIs to address the skills requirements pertaining in the industry. Industry expects the HEIs to be effectively responsive to their skills needs, and on the other hand HEIs expect industry to be explicit and specific in their requirements. Both of these expectations seem impractical due to the dynamic nature of the industry. Further, by limiting the student engagement to the course duration, universities loose an opportunity they would have otherwise had in terms of obtaining skill requirements of the industry through a graduate feedback loop. Traditional student-engagement, therefore, acts as a contributing factor for lack of collaboration between the HEIs and their own graduates. Also, most of the built environment education programmes delivered by HEIs are based on traditional mode of course delivery such as face to face. Lack of time being one of the major barriers in obtaining lifelong learning, the industry practitioners prefer more flexible forms of learning methods than a face to face mode of learning courses. This type of flexible route of learning can attract more employed students; provide an opportunity for practitioners to enhance their knowledge and skill base; and facilitate them to become more active lifelong learners. Therefore, in creating a lifelong learning environment, it is recognised as vital to adopt, diffuse and exploit latest learning and teaching technologies. Naturally any organisation or people resist to changing environments and the universities do not speedily adopt these latest technologies into their teaching and learning methods. Another major barrier in responding to industry skill requirements is the time consuming protocols within the university system to make changes to existing course contents and to introduce new courses. Therefore it is of utmost importance to design a mechanism to make the approval processes faster without compromising the quality. There are conflicts of interest identified both within the different stakeholders of HEIs such as governance, teaching staff, programme directors and learners; and between HEIs and other external stakeholders such as industry and professional bodies. This creates a hostile environment within the higher education as they might not be able to manage the stakeholder expectations effectively. Lack of collaboration between HEIs and enterprises have been identified as one of the major barriers in addressing skill requirements and providing lifelong learning opportunities. Both industries and HEIs should commit to develop formal partnerships in order to make the lifelong learning of industry practitioners a reality.

Lack of community engagement is another obstacle in responding to industry needs effectively. HEIs hardly involve with community in their business and thus they are not sufficiently aware of the community needs and wants. If the universities can enhance their community engagement they can be in a better position to design appropriate lifelong learning opportunities to the community.

- Industry requirements are vastly varied and dynamic
- Expectation mismatch between HEIs and Industry
- Traditional student-engagement in HEIs
- Traditional mode of course delivery
- Reluctance to adopt, diffuse and exploit latest learning and teaching technologies
- Time consuming protocol to make major changes
- Conflicts of interest between the stakeholders
- Lack of collaboration between HEIs and industry
- Lack of community engagement

2.3 Good practice guidelines

Effective response to industry requirements

Universities are expected to provide an effective response to industry requirements. One method of providing effective response could be in terms of encouraging research studies which are purposive and applied directly to the construction industry. There are several ways of incentivising such research efforts. These include allocating adequate research funds, necessary resources, infrastructure and other support in order to encourage staff to engage in research projects through which the current issues pertaining in the industry are tackled. Also, it is proposed to establish formal links between HEIs and industries and encourage academics to gain industry related skills by moving from the universities to industries. At present there are several means of acquiring industry input to academia, such as arranging industry experts to deliver guest lectures, appointment of industry experts as external lecturers and examiners, and recruitment of staff with sufficient industry exposure. However, the engagement of industry experts in programmes and curriculum development, setting up of course works and assessments, students and staff training programmes are recognised important. Up to date knowledge acquisition is another major requirement in providing rapid response to industry skills requirements. As such, all academic staff especially teaching staff is required to update their knowledge and skills periodically in order to provide an up to date knowledge and skills to the students. Providing students with industry exposure during their course duration was identified as a factor that increases the employability of such students upon their graduation. At the moment, different universities provide opportunities for students to obtain industry exposure in various scales. One suggestion is to make industry placements as a mandatory requirement aligned to student's assessment. Another way of obtaining industry requirements is through the professional bodies. Professional bodies are believed to be closer to the industry and enriched with more up to date skills and knowledge. Universities can get the latest skills and knowledge requirements through closer collaboration with professional bodies. Finally, it is proposed to reduce the red tape in university governance to make the system more flexible. The approval process normally goes through several committees at different levels, such as school level, college level and university level. Due to this protocol, quite often the university system does not allow making changes on a timely manner and this hinders responding to industry needs effectively.

Recommendations

- Incentivise research programmes which specifically address the industry needs
- Formal staff exchange programmes between industries and HEIs
- Demonstrate evidence periodically on up-to date knowledge acquisition
- Provide industry exposure to students
- Obtaining skills requirements through Professional bodies
- Remove process obstacles for rapid response to skills demands (in terms of lifelong learning)

Close collaboration between HEIs, industries, professional bodies and communities

At the moment there is a very limited formal partnership established between HEIs, industries and communities in terms of skill capturing and responding. There are number of informal mechanisms through which universities obtain industry and community requirements. It is proposed to formalise the skill capturing mechanism and to accommodate formal partnerships with industries and communities. Built environment is a field which consists of a number of disciplines. Every discipline in the built environment sector is regulated with professional bodies. These professional bodies do much research on the industry and are expected to be up to date with all the

industry requirements. Thus keeping a close collaboration with professional bodies and other related industries will help universities to be more aware of the industry requirements. It is also proposed to strengthen the public engagement. The needs and wants of the public are diverse. However, engaging public at local level may provide an opportunity for universities to understand their concerns, life patterns, requirements and accordingly design and deliver courses which can directly cater to their requirements. The stakeholders involved in the collaboration might receive different benefits according to their individual needs and goals. Thus, it is suggested that the healthy collaboration between the stakeholders of HEIs, industries, professional bodies and communities needs to be developed in such a way so that incentives for the individual stakeholders are aligned. In some instances, it is identified that some of the teaching staff are not up to date with the changing requirements of the industry. Hence it is the responsibility of the universities to ensure that their teaching staffs are up to date with the latest skills and knowledge required in the industry. Finally, it is proposed to build up a training platform to facilitate work placements during course duration. Thus universities are expected to create a platform which can bring together all companies in the built environment sector and allocate students to different companies in order to gain practical work experience during their programme of study. This can be converted to an assessed module and students could be assessed based on the experience they gained during the industry placements.

Recommendations
- Governance to accommodate formal partnership with industries
- Strengthening collaboration between HEIs, industries, professional bodies and communities
- Strengthening public engagement
- Development and alignment of incentives for stakeholder buy-in
- Provide opportunities for teaching staff to gain more knowledge on industry requirements
- Develop a training platform to facilitate student work placements while learning

Lifelong learning via 'through-life studentship'

Through-life studentship has been recognised as important component to make 'lifelong learning' works. Traditional student engagement in majority of the higher education institutions is limited to the length of course duration. This is one of the reasons why providing lifelong learning by higher education is a challenge. Hence the recommendation suggests providing lifelong learning via through-life studentship. Establishing through-life studentship will not only strengthen the relationship between the higher education institutions and their former students, but also lay a pathway for lifelong learning. Learning networks are suggested to be created to provide lifelong learning opportunities to built environment professionals. These networks can be designed on specific issues and within disciplinary, interdisciplinary and multi disciplinary context. Universities should champion these learning networks by demonstrating their students how these learning networks operate and can encourage them to get involved once they ate graduated from the university. As lifelong learning includes formal, non-formal and informal learning, for universities to become lifelong learning provides, they have to be flexible enough to accommodate informal and non-formal learning which are somewhat limited within HEIs. HEI should accommodate non-traditional learning such as short programmes, CPDs, distance learning, e-learning etc. to the built environment education in order to engage built environment professionals with lifelong learning opportunities. Universities need to educate their students on lifelong learning. Lifelong learning concepts can be promoted through various promotional materials, and teaching. Need of lifelong learning needs to be discussed within the programmes and modules. HEIs should be able to ensure the programme and modules that are provided explicitly contribute to lifelong learning through various means such as providing students with industry exposure; providing the students with the dynamic nature of the labour market; emphasising the importance of continuous learning; using non-traditional mode of teaching and learning environment to make the students familiar with lifelong learning. Construction is a dynamic industry and the skills and labour requirements are changing very frequently. Thus, it is suggested that the students are to be made agile to be responsive to this nature of the industry rather than making the system agile. In this context, the graduates from the university needs to be trained in such a way that they can adopt different industry needs and appropriately apply the knowledge they have gained in changing environments. Different universities have different areas of expertise. Thus universities and other professional and industry bodies could establish franchise systems to provide lifelong learning education to built environment professionals. In such arrangements, different modules can be taught by different partners based on their expertise.

Recommendations
- HEIs should champion post-study learning networks
- Integration of formal, informal and non-formal learning in a manner which collectively contribute to lifelong learning

- Explicitly establish line of sight for lifelong learning in terms of teaching and learning methods, module contents, overall programme, university culture
- Ensure the programmes and modules explicitly contribute to lifelong learning
- Pedagogy - Make the students agile to cater them to work in dynamic environment
- Establish a franchise system to provide lifelong education to BE professionals

Promote to adopt, diffuse and exploit latest learning and teaching technology

Lifelong leaning could be facilitated by innovative learning and teaching technologies. Various innovative teaching and learning techniques have emerged as a result of innovation in research and practice, technological advancement and changing needs of society. Different techniques are applicable for different scenarios and the universities are expected to promote, adopt, diffuse and exploit these latest technologies to enhance the lifelong learning provision within the institutions and to provide a better service to its current and prospective students. Open source resource platforms are widely available which can be used as a platform to provide lifelong learning opportunities. These open source platforms are largely available to public. HEIs have access to all the latest teaching materials and knowledge and therefore they can either individually or collectively deposit useful materials to these platforms. In doing so, a learner who wishes to enhance the skills and knowledge on a particular area could directly access these learning materials and will be able to learn in a more flexible manner. These platform need to be equipped with online forums, where the learner can clarify any unclear matters through the forums. By doing so, universities can support the lifelong learning needs of the built environment professionals. As a result of this flexibility, HEIs will be able to attract more working students and thereby enhance the provision of lifelong learning within universities. ICT based tools help to exploit learning and teaching technologies. Thus, adopting these ICT based teaching and learning techniques will attract more students.

Recommendations
- Promote harnessing of learning and teaching technology to facilitate lifelong learning
- Use of open source resource platforms to promote lifelong learning in the built environment
- ICT based teaching and learning techniques

Higher education policies

Higher education policies are available at various levels such as EU level, national level, institutional level, department level, module level. Some of which are common to the nations and some others are specific to the institutions. The level of authority who have the power to make an influence in the policy can vary depending on what policy they intend to change. For example in UK, Higher Education Funding Council for England (HEFCE) and Quality Assurance Agency for higher education (QAA) are two of the most influential bodies who can make change in the policies across the country. In terms of policy level contributions, the BELLCURVE research team proposes that policies to be influenced to encourage incorporating lifelong learning approach within higher education governance system and to promote lifelong learning opportunities among built environment professionals. In the present context most of the contributions to lifelong learning are made on individual basis. The industry and professional collaborations are also taken place through personal contacts. Despite the benefits HEIs received through these individual based efforts, the academic recognition and evaluation of those efforts are not materialised. In this regard this project suggests that these contributions need to be recognised and evaluated on a regular basis. Further, a formalised mechanism to recognise such contributions will encourage more people to contribute towards lifelong learning. Lack of funds to support lifelong learning through higher education in the built environment sectors should be addressed in order to promote through – life studentship in such sector. In general, student work placements are not formalised within the higher education system. BELLCURVE recommends that formalising student work placement will increase the opportunities for students to get an industry exposure while providing a platform for future collaboration and lifelong learning opportunities.

Recommendations
- Recognition and evaluation of contributions to lifelong learning
- Fund allocation for lifelong learning in the built environment
- Formalise student work placements

Acknowledgements

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Sample of Respondents

	Target entities	Primary stakeholders	Secondary Stakeholders
1	Educational	Higher Education Institutions	Head of Governance Unit; Associate Secretary of Governance; and Heads of Schools, Deputy Heads of Schools, Programme Directors, Lecturers, Senior Lecturers, Research Fellows in the built environment education
2	Industrial	Construction Industry and employment market monitors	Engineers, Quantity Surveyors, Project Managers, Construction Managers
3	Professional	Built Environment related Professional Bodies and Professional Standard Agencies	Built environment industry practitioners and academics
4	Learning	Built Environment education and industry	Undergraduates, Postgraduate students, Unemployed graduates, Employed graduates

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