

## Baseline study on the status and degree to which the built environment curriculum incorporates the five knowledge areas

### Abstract

A baseline study was carried out by the Council for the Built Environment (CBE) to ascertain the extent to which education and ongoing professional development within the Quantity Surveying, Architectural, Engineering, Landscape Architecture, Project and Construction Management and Property Valuation professions incorporate Environmental Sustainability, Construction Health and Safety, Labour Intensity, Integrated Development Management Systems (IDMS) and Human Settlements Planning and Design. Semi structured interviews and documentary analysis was used to collect the data. The study indicates that none of the built environment professions' education and ongoing professional development programmes incorporates the five defined knowledge areas. It goes on to show that of the five knowledge areas, Environment Sustainability is most often included, followed by Construction Health and Safety and then Human Settlement Planning and Design. None of the built environment professions' education and ongoing professional development were found to have incorporated the Integrated Development Management System (IDMS) and Labour-Intensive Construction knowledge areas. The study recommends that skills modules, based on relevant Unit Standards, are developed for the five knowledge areas. These skills modules should be readily accessible and affordable to Built Environment students, candidates and registered professionals. This can be achieved by providing access through an online portal and subsidising development costs through Sector Education Training Authority (SETA) or other funding.

### Introduction

The Council for the Built Environment (CBE) is the governing body for the Built Environment. The CBE is tasked with, amongst other objectives, ensuring uniform application of norms and guidelines set by the councils for the built environment professions (Council for the Built Environment Act No. 43 of 2000). The CBE has a mandate in relation to built environment professional councils and coordinates the following councils:

- South African Council for the Architectural Profession
- South African Council for the Project and Construction Management Profession
- Engineering Council of South Africa

- South African Council for the Landscape Architectural Profession
- South African Council for the Property Valuers Profession
- South African Council for the Quantity Surveying Profession

Various studies on Construction Health and Safety, Enhancing Skills for Sustainable Buildings, Labour Intensive, and IDMS were developed in 2014 by the CBE to ascertain how skills in these areas could be improved in South Africa. These studies therefore had a focus on curricula for built environment professionals registered with the CBE professional councils.

This baseline study was undertaken to ascertain the extent to which education and ongoing development with the various professional councils incorporate

Environmental Sustainability, Construction Health and Safety, Integrated Development Management Systems and Human Settlements Planning and Design into their curricula. It was intended to facilitate engagement with the various role players in BE education and training.

## Methodology

The project employed a qualitative research approach which enables the collection of in-depth data without the big sample required in quantitative research. The reason for this option is that most qualitative studies can reach data saturation within a range of 9-17 interviews (Hennink & Kaiser, 2021). There are outliers though where data saturation can be reached with 5-24 interviews (Hennink & Kaiser, 2021). The project also utilised structured interviews as a means of data collection. The methodology for the project was developed and refined in discussion with the CBE. The terms of references indicated that the study field should assess the extent to which the five defined knowledge areas are incorporated into built environment professional education and ongoing professional development.

In order to ensure consistency, it was important that agreed definitions to these knowledge areas were developed. Therefore, during the inception stage, definitions were developed and agreed with the CBE. These definitions were then applied throughout the study. Agreed definitions are outlined below:

- **Environmental sustainability:** Environmental sustainability refers to the rate of renewable resource harvest, pollution creation and non-renewable resource depletion that can be continued indefinitely
- **Construction health and safety:** The primary objective of construction health and safety is the prevention of accidents with their consequences of injury, disablement and fatality, and ill health within the work environment.
- **Labour intensity:** Refers to the economically efficient employment of as great a proportion of labour as is technically feasible on construction projects.
- **Integrated development management system (IDMS):** The IDMS toolkit provides a documented body of knowledge and a set of processes that represent generally recognised best practices in the delivery management of infrastructure.
- **Human settlement planning and design:** Human settlements are defined as the totality of human community – whether a city, town or a village – with all social, material, organisational, spiritual and cultural elements that sustain it.

A registrar interview was developed and discussed with the CBE during the inception phase. Letters, requesting interviews with registrars including the instrument, were sent to all BE professional councils

one or two weeks prior to proposed interviews. An introductory letter from the CBE was also included in this communication.

Interviews followed the structure of the instrument and included a general introduction to the purpose of the study and the format of the interview. During the interviews, registrars were asked to identify all accredited courses leading to professional registration. This data, as well as course curricula and yearbooks, were used to identify courses.

During interviews, registrars were requested to provide literature on candidacy programmes and professional registration requirements. In addition, many BE council websites included such information.

The data gathered through interviews were analysed to estimate the extent to which the defined five knowledge areas were incorporated in BE professional curricula.

Some limitations were encountered, namely a wide range of different terms were used to refer to similar courses. In addition, detailed course descriptions and syllabi for accredited courses were not always available for analysis.

Despite these limitations, the methodology provided a valuable picture of the extent to which defined knowledge areas have been incorporated into BE professional education as well as candidacy and CPD level.

## Research Findings

Through the method described, the following findings emerged:

### South African Council for the Property Valuers Profession (SACPVP)

Registration as a professional valuer requires the successful completion of an accredited course at a recognised Higher Education Institution (HEI) and the completion of a mentorship period with a registered property valuer.

Professional status is maintained through Continuous Professional Development (CPD) which require professionals to undertake specific minimum ongoing education and development activities (SACPVP, 2016).

Courses are accredited by the Council for Higher Education (CHE). In addition, the SACPVP carry out accreditation visits (SACPVP, 2016).

Accredited courses leading to registration as a property valuer are offered at the following HEIs:

- Cape Peninsula University of Technology
- University of the Free State
- University of Cape Town
- University of Witwatersrand
- University of Pretoria

- University of Johannesburg

A review indicated that accredited course curricula include some subjects related to environmental sustainability and human settlements, but do not address these comprehensively.

A review of the CPD requirements indicates that there is no direct requirement to address the knowledge areas.

South African Council for Landscape Architectural Profession (SACLAP)

Registration as a professional landscape architect requires the successful completion of an accredited course at a recognised HEI and the completion of a mentorship period with a registered landscape architect.

Courses are accredited by the CHE. In addition, the SACLAP conducts accreditation visits.

Accredited courses leading to registration as a property valuer are offered at the following HEIs:

- University of Cape Town
- University of Pretoria
- Cape Peninsula University of Technology
- Tshwane University of Technology

The knowledge areas required for a landscape architect are indicated in core competency tables. A review of these indicate that reference is made to Town Planning aspects and basic building construction, which relate to environmental sustainability and human settlements planning and design. Construction health and safety, labour intensity and IDMS are not addressed.

A review of the CPD requirements indicate that there is no direct requirement to address the particular subject areas (SACLAP, 2011).

South African Council for the Architectural Profession (SACAP)

Registration as a professional architect requires the successful completion of an accredited course at a recognised HEI and completion of a mentorship period with a registered architect.

Courses are accredited by the CHE. In addition, the SACAP conducts accreditation visits.

Accredited courses leading to registration as an architect are run at the following HEIs:

- Cape Peninsula University of Technology
- University of the Free State
- University of Cape Town
- University of Witwatersrand
- University of Pretoria
- University of Johannesburg
- Tshwane University of Technology
- University of Kwa Zulu Natal

- Nelson Mandela University
- National University of Namibia

On completion of a recognised accredited course, candidates are required to enter a mentorship period with a registered architect during which the candidate must be exposed to a specific range of experience.

A review of the knowledge areas required for an architect indicated that reference is made to environmental relationships, contextual and urban relationships and building services as well as human settlements, but do not address construction health and safety and IDMS.

A review of the CPD requirements indicates that there is no direct requirement to address the knowledge areas.

South African Council for the Quantity Surveying Profession (SACQSP)

Registration as a professional quantity surveyor requires the successful completion of an accredited course at a recognised HEI.

Courses are accredited by the CHE. In addition, the SACQSP conducts accreditation visits.

Accredited courses leading to registration as a quantity surveyor are offered at the following HEIs:

- Cape Peninsula University of Technology
- Central University of Technology
- Durban University of Technology
- Mangosuthu University of Technology
- Walter Sisulu University of Technology
- University of the Free State
- University of Cape Town
- University of Witwatersrand
- University of Pretoria
- University of Johannesburg
- Tshwane University of Technology
- University of KwaZulu-Natal
- Nelson Mandela University

On completion of a recognised accredited course, candidates are required to enter a mentorship period with a registered quantity surveyor during which the candidate must be exposed to a specific range of experience.

A review of the knowledge areas required for a quantity surveyor are outlined in the SACQSP letter of undertaking. A review of this indicated that reference is made to construction health and safety and environmental sustainability, whereas subjects to the other areas are not.

A review of the CPD requirements indicates that there is no direct requirement to address the knowledge areas.

South African Council for Construction Project and Construction Management Professions (SACPCMP)

Registration as a professional construction project and construction manager requires the successful completion of an accredited course at a recognised Higher Education Institution (HEI)

Courses are accredited by the Council for Higher Education (CHE). In addition, the SACPCMP carry out accreditation visits (SACPCMP, 2016).

Accredited courses leading to registration as a professional construction and project manager are run at the following HEIs:

- Cape Peninsula University of Technology
- Central University of Technology
- Durban University of Technology
- Mangosuthu University of Technology
- Walter Sisulu University of Technology
- University of the Free State
- University of Cape Town
- University of Witwatersrand
- University of Pretoria
- University of Johannesburg
- Tshwane University of Technology
- University of Kwa Zulu Natal
- Nelson Mandela University

On completion of a recognised accredited course, candidates are required to enter a mentorship period with a registered project manager during which the candidate must be exposed to a specific range of experience (SACPCMP, 2016).

A review of the knowledge areas required to be a project manager are outlined in the SACPCMP registration policy. A review of this indicated that subjects related to construction health and safety and environmental sustainability are included, whereas subjects to the other areas are not (SACPCMP, 2016).

A review of the CPD requirements indicates that there is a direct requirement to address particular subject areas such as health and safety management, environmental management systems and ethics (SACPCMP, 2016). Subjects for other knowledge areas are not included.

#### Engineering Council of South Africa (ECSA)

Registration as a professional engineer requires the successful completion of an accredited course at a recognised HEI. It also requires the completion of a mentorship period with a registered engineer during which the candidate must demonstrate experience of a specified range of tasks.

Courses are developed by HEI departments who submit these to the CHE for accreditation. Initial accreditation visits are conducted by the CHE. Following this, there is an accreditation cycle carried out by ECSA.

Accredited courses leading to registration as an engineer are offered at the following HEIs:

- Cape Peninsula University of Technology
- Central University of Technology
- Durban University of Technology
- Mangosuthu University of Technology
- Walter Sisulu University of Technology
- University of the Free State
- University of Cape Town
- University of Witwatersrand
- University of Pretoria
- University of Johannesburg
- Tshwane University of Technology
- University of KwaZulu-Natal
- Nelson Mandela University

The knowledge areas that candidates should cover during the candidacy period is outlined in the Policy on Registration of Persons in Professional Categories in the training guide for professional engineers. A review of this indicated that subjects related to construction health and safety and environmental sustainability are included, but subjects to the other areas are not.

A review of the CPD requirements indicates that there is a direct requirement to address subject areas such as health and safety management, environmental management systems and ethics. Subjects for other knowledge areas are not included.

#### **Recommendations**

Recommendations are structured under short-term and long-term recommendations. Short-term recommendations indicate actions that can be taken immediately to support the incorporation of knowledge areas into the built environment education and professional development. Long term recommendations provide a longer-term structured approach.

Short-term recommendations: Skills modules for the defined knowledge areas should be developed. Appropriate Unit Standards for these skills modules should be identified or developed. Skills modules should ensure that defined minimum competencies are achieved on completion of the module.

Skills modules should be made readily available and affordable to all BE students, candidates and registered professionals. Skills modules developed by the SA Council for the QS Profession (SACQSP) can be used as examples. BE councils should ensure that all students, candidates and registered professionals are aware of the modules and encouraged to undertake them, for example, in CPD requirements.

Long-term recommendations: BE councils should review processes that define the core competencies required for professional registration. This review should ensure that new and emerging competencies that are deemed to be required by professionals are included in their education and ongoing professional development. Such core competencies must be reflected in all related qualifications, accredited

courses and CPD programmes. it is recommended that a standard coordinated approach is developed to enable all BE professional councils to share frameworks and draw on synergies.

## Conclusion

The study indicated that none of the BE professionals' education and ongoing development incorporated all of the five knowledge areas. It showed that of the five areas, Environment Sustainability is most often included, followed by Construction Health and Safety and then Human Settlement Planning and Design. None of the other two competencies were found in either education or ongoing development programmes.

## Areas for Future Research

Future research could look into the extent to which the findings of this study have been accepted and the recommendations implemented by the CBEP. Future studies could examine international best practices on the incorporation of all of the five knowledge areas.

## References

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This research brief draws its origins from the 2017/18 CBE Research Report: Baseline study on the status and degree to which the built environment curriculum incorporates the five knowledge areas.