

# GAPS IN CONSTRUCTION PROJECT MANAGEMENT EDUCATION PROGRAMMES WITHIN SADC: LESSONS FOR EDUCATORS

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In English speaking SADC countries, like in a number of English Commonwealth countries, individuals become construction project managers in what may be described as by 'accident'. It has become a norm that those with technical skills (e.g. Architects) are requested to run construction projects as project managers under numerous titles due to their technical speciality. However, the technical part of a construction project is often the smallest and easiest part. Technical success does not necessarily lead to construction project success and most projects are mismanaged. This sorry state of the Southern Africa construction industry has created demand for training in construction project management (CPM). Various institutions of higher learning, have responded by providing training in construction project management in order to address the 'accidental construction project management syndrome'. However, taking a closer look at various programmes in construction project management, there are strong indications to suggest that the offering institutions may not be fully aware of what is required and are often misled by the various project management knowledge bases, floated around by various associations. The paper takes a turbulent journey to identify knowledge base gaps of selected CPM programmes from four higher learning institutions in Southern Africa to provide an indication of the gravity of the hypothesised problem. Based on the analysis, an appropriate CPM programme framework is developed and recommended for higher institutions in the SADC region.

Keywords: construction project management, education, Southern Africa.

## INTRODUCTION

For several decades, construction industries across the globe have been accused of poor performance. Work takes a long time to get started while late completion, disputes and extra costs are a common feature (Ssegawa, 2008). Some construction industries in the Southern African Development Community (SADC) have incurred a similar blame. Hindle and Rwelamila (1993) noted numerous cases of poor delivery of projects arising from ineffective procurement systems used, lack of competence of the industry players who plan, manage and execute project work. Ssegawa and Ngowi (2007) also noted that the construction industry in Botswana might not meet its developmental mandate if it continued performing inefficiently and ineffectively as in the past two decades. The major sources of the problem cited were the archaic

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procurement system being used to procure projects, ineffective contractors, inefficient clients and incompetent client representatives or 'project managers'.

Rwelamila (2000) argued the continued use of the traditional procurement system (TPS) in a majority of the construction industries of the English Commonwealth countries as a major contributor to the poor performance. Masterman (1997) noted that the inherent problems of TPS were publicly identified in UK in the 1990s but it is interesting to note that some countries have continued to use the system without appropriate adjustments. The greatest problem of the TPS lies in its fragmented nature and its resultant use of architects and engineers (AE) for building and civil engineering projects, respectively, as construction project managers (CPMs) or more exactly as 'accidental construction project managers'. While AEs may be star performers in their professions, a number of them hardly have the CPM knowledge base and thus the competence in project management. This trend has become 'normal' to an extent that its negative effects on projects are considered to be 'normal' as well. Most of the AEs who act as accidental CPMs and count on their technical knowledge to make decisions which are not based on their capacity to understand the project environment and ability to influence or motivate people. A number of studies have reinforced this argument, for example, and Gadenken (1994) strongly supported the idea that technical expertise is not the most important requirement for successful construction project management. The findings strongly reinforce the argument that any construction technical expert (i.e. AEs), a Construction Manager, a Building Services Engineer, a Building Surveyor, or a Quantity Surveyor who wants to become a construction project manager should attend a project management course. The Chartered Institute of Building (CIOB 2002) has also argued for separating the management from the design and execution functions of a project for the CPM profession. It is clear, the practice of promoting the best AEs (and related professions) without CPM training to manage projects, especially at the construction phase, is ill founded. Therefore, those who want to be effective CPMs must go an extra mile and acquire post-graduate qualifications in project management (generic) or construction project management (built environment specific). To turn things around, clients should insist on CPMs with an appropriate knowledge base and experience (Ssegawa, 2008). The appropriate starting point for a CPM expert is to acquire appropriate CPM knowledge from a higher learning institution.

The development of recognisable project management body of knowledge (BoK) continues unabated throughout the world. Several professional bodies continue prescribing what knowledge and skills a future CPM ought to have, for example, the PMBoK (PMI, 2004), APMBok (APM, 2006) and CPPMBok (IAPPM). Some of the institutions of higher learning have relied on the bases to develop their programmes. However, the question is: are programmes crafted from these and other PM knowledge bases appropriate to bridge the CPM knowledge gap? The paper seeks therefore, to answer the question by conducting a critical content analysis of four programmes from randomly selected institutions in Southern Africa and compare them with an authoritative CPM knowledge base in order to find the missing gaps. Based on the analysis, an appropriate CPM programme framework is developed and recommended.

## **DEFINING THE CPM KNOWLEDGE BASE**

The argument for postgraduate training in project management (whether generic or built environment specific), requires higher institutions of learning developing and

offering appropriate programmes to train a future CPM. To assess their appropriateness a project management knowledge base was constructed by synthesis of literature resulting in what may termed a well-balanced project management programme (generic or construction focused) covering seven broad topic areas as indicated in Table 1.

*Table 1: Project management curriculum dimensions*

Main Broad Dimensions	Sub-dimensions
PMCK1: Planning techniques (PT)	Ability to put together a project plan - project planning; estimating; and risk analysis techniques
PMCK2: Behavioural aspects of PM (BAPM)	Team building; motivating team members, and networking (dealing with upper managers, contributing department managers and other stakeholders).
PMCK3: Controlling techniques (CT)	Project monitoring, project reviews; skills for meetings; project audit techniques; and project close-out techniques.
PMCK4: Organisational issues (OI)	Techniques for managing across organisations when the PM has all the responsibility and little authority.
PMCK5: Business fundamentals (BF)	Business of the organisation; how decisions affect the bottom line, how to run a project as if it were a business.
PMCK6: Marketing and customer issues (M&CI)	Techniques of defining and developing a market; understanding the needs and desires of the project's customers and end users.
EPMK: Creating an environment for successful projects (CESP)	Change to project-based organisations; strategic emphasis for projects and portfolio and programme management; developing a core team process; developing PM in the organisation; organising for PM; understanding upper management influence; developing a learning organisation, planning for project manager selection; and developing a PM information system.

The dimensions were used as a yardstick for the required knowledge and skills dimensions needed for an effective future CPM. Furthermore, in order to put the seven dimensions in context, there was need to revisit research studies on critical success factors of a project. Debates on project success from various researchers and practitioners (for example, Pinto and Slevin 1988; Cooke-Davies 2002; Gardiner 2005) have led to a significant level of understanding of project success criteria. The success factors of project and their relationship with the proposed dimensions of PM curricula (Table 1) are shown in Table 2.

Cooke-Davies (2002) work provided further insight to project success by defining a two success criteria. Firstly, success criteria may be defined by the inputs to the management system that lead directly or indirectly to the success of the project (project management success). This is referred to as the project management coal-face knowledge (PMCK).

The second criteria is defined by a project's objectives which is due to executive project management knowledge (EPMK). Using the two criteria, a construction project success bridge concept was proposed by Rwelamila (2008) and is illustrated in Figure 1. The factors (Table 2) clearly indicate project success is a combination of 'Construction Project Knowledge (PMCK)' and 'Strategic PM Knowledge (EPMK)' which is a down-stream and upper-stream PM knowledge base of the project success bridge (Figure 1). Matching down-stream (B) and upper-stream PM knowledge base

(A) to ‘Critical success factors of project success’ (Table 2), strengthen the importance of all seven dimensions in any full fledged CPM programme.

*Table 2 :The relationship between PM success factors and PM curriculum broad topics (Source: Rwelamila, 2008)*

Critical success factors of project success	PM curriculum broad topics
Adequacy of company-wide education on the concept of risk management	EPMK
Maturity of an organisation’s processes for assigning ownership of risk	EPMK and PMCK1
Adequacy with which a visible risk register is developed and maintained	EPMK and PMCK1
Adequacy of documentation of organisational responsibilities on the project	EPMK
Keep project (or project stage duration) as far below 3 years as possible (1 year is better) - risk forecast considerations	EPMK
Allow changes to scope only through a mature scope change control process	PMCK1
Maintain integrity of the performance measurement baseline	EPMK and PMCK3
Existence of an effective benefits delivery and management process that involves mutual cooperation of project management and line management functions	EPMK ; PCMK2; EPMK4
Portfolio and programme management practices matched to the corporate strategy and business objectives	EPMK
A suite of project, programme and portfolio metrics that provide feedback on current project performance and future success, so that project, portfolio and corporate decisions can be aligned	EPMK; PCMK5; PCMK6
An effective means of learning from experience on projects, that combines explicit knowledge with tacit knowledge to encourages people to learn and embed learning into continuous improvement of PM processes and practices	EPMK and PMCK3

## RESEARCH METHODOLOGY

In order to interpret, verify, evaluate and establish the nature of project management knowledge base contained in various CPM programmes, a qualitative study was carried out. This required several steps taken to answer the research question posited at the beginning of the paper. Firstly, nine and one higher learning institutions offering project management programmes, were identified from South Africa and Botswana, respectively as indicated in Table 3.

A systematic random selection was carried out among the nine (1-9) higher learning institutions from South Africa of which three were selected together with one institution from Botswana for the study. In order to keep the names of the universities studied anonymous to allow a focused analysis, the institutions selected were identified as UN1, UN2, UN3 and UN4.

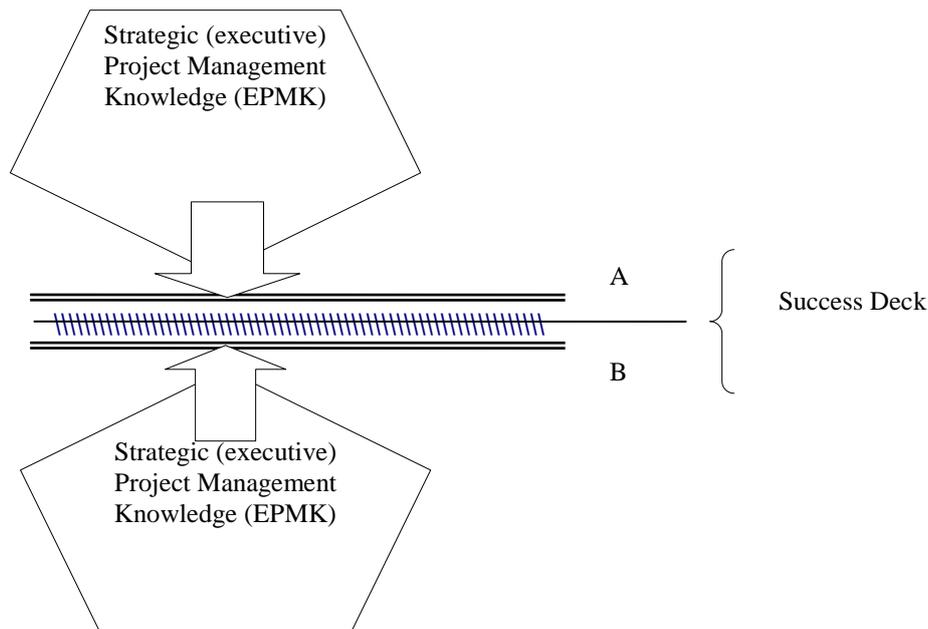


Figure 1: The construction bridge success (Source: Rwelamila (2008))

Table 3: Higher learning institutions providing project management training

Institution	Type of Qualification1	Type of Programme2
University of South Africa	D, P and Cert.	G
University of Pretoria	M and Cert.	CS
University of Cape Town	M and PGD	G
Nelson Mandela Metropolitan University	M and D	CS (M) and D (G)
University of Kwazulu Natal	M, PGD and Cert.	G
Witwatersrand University	M	CS
Cape Peninsular University of Technology	D	CS
DAMELIN	D	G
Cranefield College	M, PGD and D	G
University of Botswana	M	G

*Masters (M)/ Post Grad. Diploma (PGD) /Diploma (D)/Programme (P)/Cert. (Duration); 2Generic (G)/Construction Specific (CS)*

Using the content analysis technique (Leedy and Ormrod 2005), a detailed scrutiny of each curriculum from the four universities was conducted to establish the extent of coverage of the seven broad and sub-dimensions in Table 1. As noted before, the dimensions define a typical fully fledged project management programme. In order to establish some basic metric for comparing the curricula for the programmes, each of the seven broad dimensions was given 100% points. Therefore, if a curriculum covered in full all the seven dimensions and sub-dimensions of the project management knowledge base, the programme obtained a maximum score of 700%.

## RESULTS OF ANALYSING THE PROGRAMMES

Programme content scores are presented in two parts, the overall programmes score and scores of each dimension for each programme.

### Overall comparative picture

Results of the analysis presented in Figure 2, indicated that three of the programmes at UN1, UN2 and UN3 obtained below half (350%) of the total scores. According to the analysis, the programmes do not adequately cover the content required to train a future project manager indicated in Table 1. Therefore, all three require significant adjustments to bridge the gap. The programme at UN4 obtained slightly over half of the total scores (365/700) but also requires adjustment. The subsequent analysis that follows provides an indication which particular dimension requires significant adjustment in each programme.

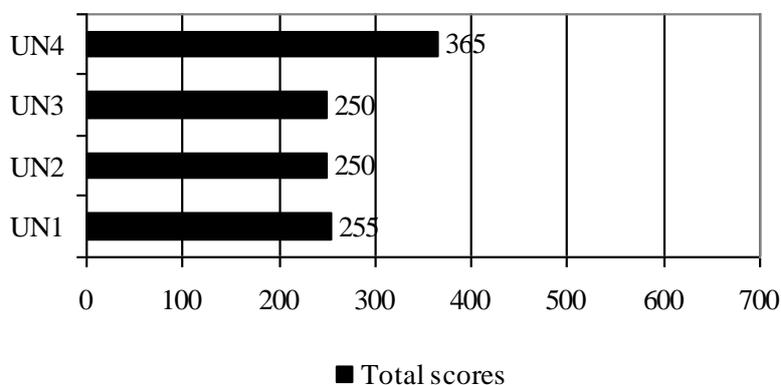


Figure 2: Comparative analyses of contents of selected programmes

### UNI1 Programme Content Analysis

The results presented in Figure 3 for UNI1 indicate the programme is stronger in project management techniques (90%) and in marketing and customer issues (60%).

While the programme focuses more on typical human resources management (HRM) fundamentals, the programme is weak in issues of team building, developing effective teams and motivating team members. The programme is also weak in business fundamentals (25%), controlling techniques (20%) and organisational issues (20%). The programme is dismally weak in the fundamentals of creating an environmental for successful projects (10%).

Based on the ‘construction project success bridge’ (Figure 1) it is clear that most of what is covered in the programme falls under the ‘Construction Project Knowledge (PMCK)’ and very little from the ‘Strategic PM Knowledge (EPMK)’ base. This strongly suggests that this programme will produce graduates with a skewed knowledge base, capable of supporting a weak ‘success deck’ of the ‘construction project success bridge’. Therefore, the programme requires an extensive review to be well balanced in both knowledge bases to remove the identified gap.

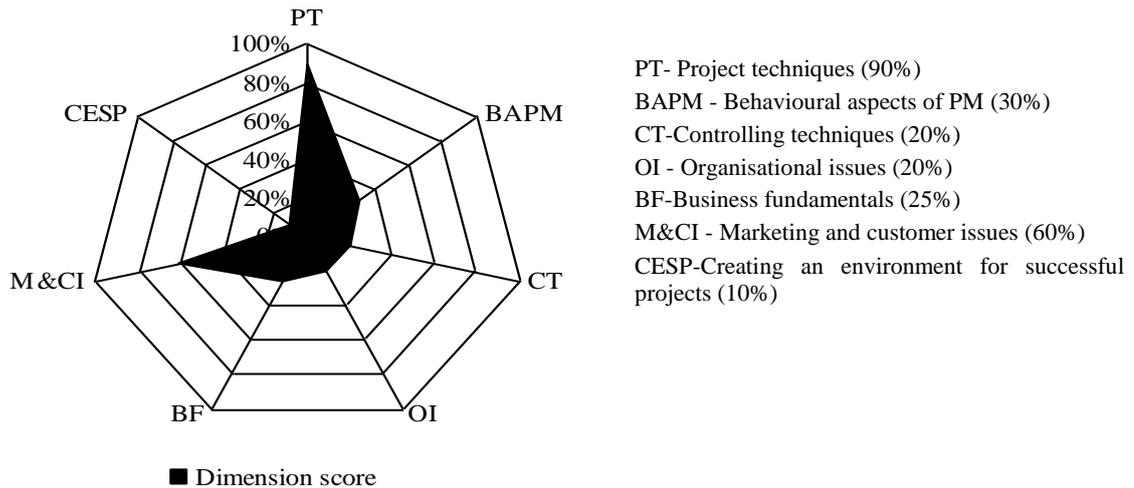


Figure 3: Content analysis of the dimensions of the programme at UNI1

### UNI2 programme content analysis

The results presented in Figure 4 indicate this programme has similar characteristics to UNI1. It has a strong score in project management techniques (90%) and in marketing and customer issues (65%). Again, like UNI1, it has a strong focus on typical human resources management (HRM) fundamentals, but weak in issues of team building, developing effective teams and motivating team members. Similar to UNI1, the programme is also weak in business fundamentals (20%), controlling techniques (20%) and organisational issues (15%). Although slightly better than UNI1 in the fundamentals of creating an environment for successful projects with a 15% score, it still falls within the same category of UNI1, dismally weak in this knowledge base.

Analysing the programme against the 'construction project success bridge' (Figure 1) results in the same conclusion as under UNI1. It is dominated by 'Construction Project Knowledge (PMCK)' and very weak on 'Strategic PM Knowledge (EPMK)'. There is a clear gap in balancing the two. Based on these results, it could be strongly argued that its graduates will have a skewed knowledge base and only capable of supporting a weak 'success deck' of the 'construction project success bridge' (Figure 1).

Like UNI1, this programme will need an extensive review where its content should have a balanced knowledge base from both 'Construction Project Knowledge (PMCK)' and 'Strategic PM Knowledge (EPMK)'.

### UNI3 programme content analysis

The results presented in Figure 5 indicate that though the spread of programme content score are different from UNI1 and UNI2, its total content score falls within the same bracket as UNI1 and UNI2. Like UNI1 and UNI2, is stronger in project management techniques (90%) and equally stronger (45%) in business fundamentals and behavioural aspects.

This is the only programme, which, in addition to being more focused on typical human resources management (HRM) like UNI1 and UNI2; it is far better in issues of team building, developing effective teams and motivating team members. Along the lines of UNI1 and UNI2, the programme is also weak in controlling techniques (25%), marketing and customer issues (20%) and organisational issues (20%). The programme is dismally weaker than UNI1 and UNI2 in the fundamentals of creating

an environment for successful projects (05%), hence a clear gap exists between the ideal PM programme and this programme.

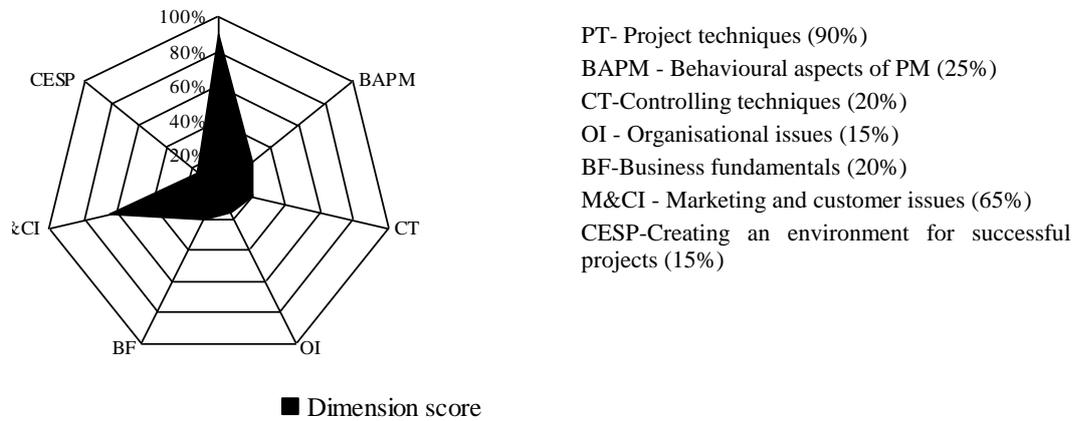


Figure 4: Content analysis of the dimensions of the programme at UNI2

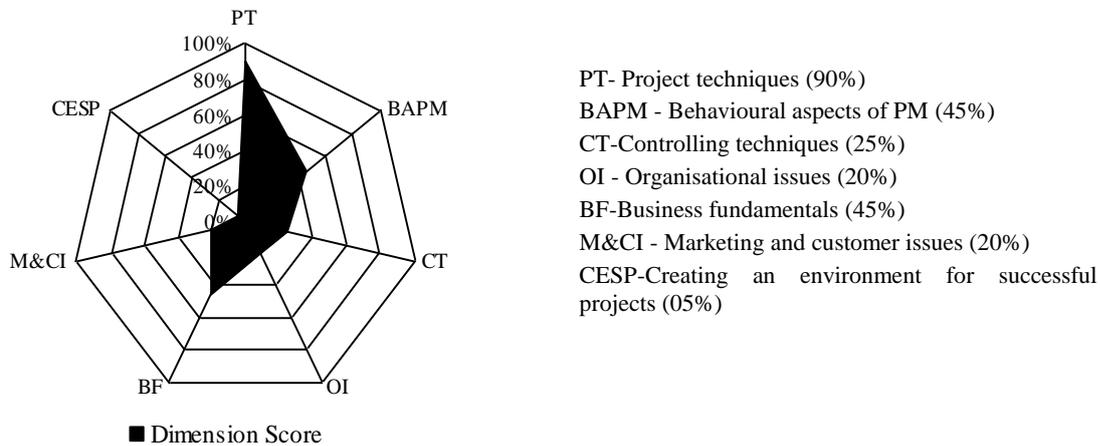


Figure 5: Content analysis of the dimensions of the programme at UNI3

With regard to the ‘construction project success bridge’ (Figure 1), the programme is one sided (dominated by ‘Construction Project Knowledge (PMCK)’). Again, this strongly suggests that this programme will produce graduates with a skewed knowledge base and only capable of supporting a weak ‘success deck’ of the ‘construction project success bridge’ (Figure 1). Along with UNI1, and UNI2, this programme will require an extensive review in order to embrace both sides of the ‘construction project success bridge’.

#### UNI4 programme content analysis

The results shown in Figure 6 indicate that the spread of programme content score is higher than the first three programmes.

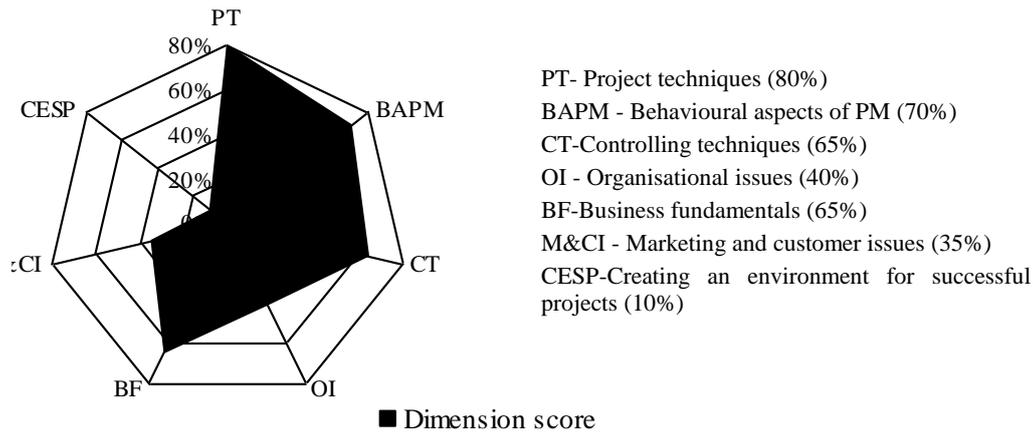


Figure 6: Content analysis of the dimensions of the programme at UNI4

The UN4 programme is stronger in project management techniques (90%), in behavioural aspects (70%), controlling techniques and business fundamentals (65%). Like UN3 programme, it has a strong content for the typical human resources management (HRM) knowledge base, team building, developing effective teams and motivating team members. However, it also has weaknesses in marketing and customer issues (35%) and organisational issues (40%). Like the rest of the programmes, it is also weak in the fundamentals of creating an environment for successful projects (10%), hence a clear gap also exists between the desired PM programme and this programme.

From the 'construction project success bridge' telescope (Figure 1), the programme is a little bit more balanced but will still produce graduates with a skewed knowledge base and only capable of supporting a weak 'success deck' of the 'construction project success bridge'. Along with all the other three programmes it will require an extensive review in order to embrace both sides of the 'construction project success bridge' (Figure 1).

## CONCLUSIONS

Studies have indicated that technical expertise resulting from being a AE (or any other related areas) is not an overriding indicator for an effective construction project manager. A future CPM needs more than technical skills to effectively manage construction projects. While higher learning institutions, particularly in South Africa and Botswana, have realised this gap and developed programmes to close it, there are strong indications to suggest, they are not offering the required programmes to produce a future CPM with appropriate knowledge. Based on the analysis of four PM programme curricula analysed, most of the CPM programmes are dominated by the technical knowledge base (e.g. WBS, schedules and budgets) of managing 'a project', thus primarily focusing on the 'project coal face'. Very little is covered under socio-cultural-plotical knowledge base (e.g. leadership, problem solving, teamwork, negotiation, organisational politics and customer expectations) and understanding the components for successful projects (e.g. strategic emphasis for projects and portfolio and programme management and developing an effective PM information system).

The weaknesses are so significant to warrant a conclusion that most South African and Botswana PM programmes exhibit a clear gap and need extensive reviews. It is hence, recommended that any review of a PM programme in South Africa and Botswana should be conducted in a well-structured manner following the proposed PM curriculum broad topics majority indicated in Table 1. Although, this is a preliminary study and limited to South Africa and Botswana, experience on PM programmes offered in other countries strongly suggests a huge similarity to those studied.

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