STEPPING INTO INDUSTRY REALITY: REVIEWING THE ROLES OF COOPERATIVE EDUCATION AND INTERNSHIPS IN FOSTERING CONSTRUCTION EDUCATION

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Abstract

The foremost aim of construction education is to equip students adequately to function effectively in the construction industry after graduation. Considering the present-day challenges and complexities of the industry, there is an increased need for graduates who do not only possess a sound academic background, but also the necessary work experience. Transition from classroom into full-time industry activities is never an easy ride for students, necessitating the need for work experience to ease the shock of transition. In light of leveraging students to handle the various demands of the present day construction industry competently, this article discusses the benefits of cooperative education and internships in fostering construction education for the future. An extant review of literature was conducted from journals, articles from databases such as Taylor and Francis Online, Springer, Emerald, ASCE, Scopus, and ASC conference proceedings, amongst others. One of the primary findings emanating from the study revealed that cooperative education provides necessary work experience which helps students experience an easy transition from the academic world to the complexity of the world of work. This work experience provides a capstone experience for students which reinforces and expounds on the theories learnt in classrooms and further improves their holistic development. With the dynamic and unpredictable nature of the present day construction industry, it is essential for students to have a résumé that includes actual industry exposure which gives them an added advantage. Hence, the findings of this paper provide a foundation to increase effective HEIs pedagogical work practices to better prepare graduates ahead of taking up positions in the construction industry.

Contact: caigbavbo@uj.ac.za. The authors declare that they have no relevant or material financial interests that relate to the research described in this paper. Also, the authors declare that the submitted paper is their original work and that, upon publication, nothing contained in it will not constitute an infringement of any copyright. Paper received 25.05.2017. Approved 30.06.2017. This paper is licensed under the Creative Commons Attribution-Non Commercial-No Derives 3.0. License. This paper is published with Open Access at www.socioeconomica.info.
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1. Introduction

The dynamic and unpredictable nature of the construction industry today has made the role of construction professionals a vital one. With factors such as an increase in technological innovations, increased project-based works and a pressing need for improved and timely results, the need for well-equipped graduates has taken on a new dimension (Tatum, 2010). It is therefore paramount that construction professionals are adequately prepared, well skilled and possess the necessary work experience to thrive in the industry, thereby increasing the need for improved construction education in our present day. Therefore, in fostering construction education, the HEIs, through their activities and actions, are primarily development hubs which are pivotal in the strengthening of future industry professionals to solve arising industry problems (Storen & Aamodt, 2010; Munap et al., 2015). These activities and actions by HEIs therefore make them key in developing construction students to enable them become industry-ready. This provides the basis for this paper.

In fostering construction education for a better tomorrow, the benefits of work experiences for students cannot be quantified as they benefit richly from these opportunities. Over time, construction site experiences have become an essential aspect of students’ development which establishes the connection between the classroom and practical experience of industry activities. The continuous emphasis on the need for work experience by industry employers as a key prerequisite for employment has further necessitated this study (Lowden et al., 2011). For most students, cooperative education serves as the very first introduction to the industry and its challenges and complexities, and it sometimes goes a long way in defining their career choices and future success in their career. By providing students with the opportunity to understand the relationship between classroom and workplace experience, their overall undergraduate education is enhanced so that they are abreast of the expectations of the industry on graduation. According to Wilton (2012), the construction industry holds in high esteem those graduates who have undergone work experiences as they are often equipped with key skills and competencies required to meet industry needs. Work experience provides students with an ample opportunity to step into industry reality and acquire key experiences and information not obtainable during conventional lectures presented in classrooms. By gaining valuable work opportunities, construction students are familiarized with the distinct characteristics and structures of the construction industry. These ultimately provide the students with invaluable experience and understanding of the various duties and responsibilities of construction industry professionals during a construction project.

In the development of the industry workforce for the future, complementing lecture-room activities with real-work activities is essential in experiential learning which encourages the growth of present day students. The concept of experiential learning is vital due to the assumptions that as students ‘learn by doing’, deeper learning occurs. This idea resonates Kolb’s (1984)
learning cycle. According to Kolb (1984), the four stages of learning are (i) experience, leading to (ii) observation and (iii) reflection, leading to the development of fresh ideas and (iv) experimentation, leading to deeper know-how and experience. Most especially, in construction-related disciplines, cooperative education provides real-world experiences which are essential in students’ development, offering the opportunity for them to interact with various industry personnel as well. This rapport with industry professionals further develops the right set of skills and boosts the confidence of students as they integrate into the industry (Wasserman, 2008).

Considering the numerous strategies in upscaling construction education today for the future workforce of the industry, this article specifically reviews the roles cooperative education and internship play in equipping the future industry professionals. The article starts out by delving into extant literature to review the various terms researchers employ in referring to pedagogical experiences which feature a mix of practical activities with formal education. The article then examines the history of cooperative education, the various definitions of internship and its benefits. In addition, ways of ensuring that internship fulfils its roles in enhancing students’ experience in preparedness for the construction industry are also discussed. The article also looks at internship as a pedagogical tool; that is, a way of developing quality graduates for the industry, as it affords students with the required work-based opportunities and significant industry knowledge to succeed. For many students, HEIs can be quite theoretical and in most cases, it is the first opportunity to practically apply related theories learnt in lecture rooms to industry reality, which necessitates the reason for this study.

2. Various names for work experiences

Groenewald (2004) suggested several terms which refer to work experience, namely (a) apprenticeship, (b) candidature, (c) career academics, (d) co-op programmes, (e) experiential learning programmes, (f) exchange programmes, (g) externships, (h) field-based learning, (i) field placements, (j) internships (k) job shadowing, (l) on-the-job learning/training, (m) practice-orientated education, (n) professional practice, (o) project-based learning, (p) sandwich degree/courses, (q) school-to-work, (r) academic-service learning, (s) summer-hire programmes, (t) work-based education/learning, (u) work experience, (v) community-service learning and (w) applied practicum. Dressler (2003) posits that although there are some fundamental differences between these terms, they are inherently developmental because they allow students the opportunity to apply what they are learning as they are learning it.

Table 1. lists the alternative names according to several literatures used to describe work experiences, which are beneficial to students. Although practical work experience has several names, this list suggests that they portray a similar philosophical belief that complementing lecture room activities with practical work experience further improves the learning process.
Table 1: Various terms for work experiences

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<th>IDENTIFIED NAME</th>
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| 1.  | Work-integrated learning (WIL)       | • Activities which provide practical work opportunities which improve the employability of graduates  
• A set of work programmes that bring together HEIs and the construction industry in creating newer learning opportunities for students  
• Developing practical skills to reflect upon in future studies  
• Short-term financial benefits for students  
• Developing an appreciation of the flexibility of a continuously changing world of work. | Groenewald (2004); Sovilla and Varty (2004); Houshmand and Papadakis (2006); Calway and Murphy (2007); McCurdy and Zegwaard (2009); Dimenas (2010) |
| 2.  | Work-based learning (WBL)            | • Learning that comes about from work activities and is student based  
• Learning that is designed to ensure students are fully equipped to take up industry positions  
• Links what students learn in school to the skills and knowledge needed for real-world careers. | Swallow et al. (2001); Burke et al. (2009); Williams (2010); Lester and Costly (2010) |
| 3.  | Vocational education and training (VET) | • Equipping students with requisite knowledge and skills to fit into the construction industry  
• Preparing students for employment in recognised occupations | Descy and Tessaring (2002); Collier and McManus (2005); Volmari et al. (2009); Misra (2011) |
| 4.  | Cooperative and work-integrated education | • Has four categories of practice which include:  
• Community/Service focus (which includes cooperative education)  
• Professional practice (consists of internships, professional practicum, amongst others)  
• Industry and field-based and  
• Other WIL opportunities (which include teaching assistantships, work study, work exchanges, research assistantships, select leadership and peer programmes)  
• Provides an effective means of developing students with non-academic skills | STUDENTS |
• Provides students with the opportunity to learn the norms of behaviour as well as offering exposure to possible science career avenues.

5. Work placement
• Helps students to develop transferable and work-related skills in actual work conditions
• Provides useful working experience about the working environment
• Enables students to become increasingly aware of the values and dynamics of the working environment.

Murakami et al. (2009); Vaezi-Nejad (2009); Gibson and Busby (2009)

6. Project-based learning
• Enhances student motivation and promotes self-directed learning
• Provide students with a diverse approach in solving real-world challenges as part of a team or alone.

Danford (2006); Marshall et al. (2010)

7. Experiential education
• Increases students’ knowledge of the world of work
• Cultivates required industry skills to enable students to contribute to society at large
• Blurs the line between theory and practice.

Southcott (2004); Eyler (2009);

8. Internship
• A structured and supervised work opportunity which enables students to understand theory better through the integration of actual work scenarios.

Taylor (1988)

9. Practicum
• Links theory and practice by providing regular structured and supervised opportunities for students to apply and test knowledge, skills and attitudes, developed largely in campus-based studies, to the world of work

Schön (1987), Hutton (1989); Williams (2009); Yan and He (2010)

Source: Researchers’ literature review

3. History of experiential learning/cooperative education

The concept of cooperative education dates back to 1906 when the Dean of Engineering at the University of Cincinnati, Herman Schneider, introduced a programme to offer work-related activities to students in his faculty (Ryder, 1987). In assessing the relevance of education to future work, Schneider, who is regarded as the father of cooperative education, realised there were two issues that could be addressed through this educational practice. Firstly, some of the students were already working on a part-time basis to address their financial needs. Secondly, there were some difficult aspects of the engineering curriculum that were almost impossible to be taught in the
classroom. According to Grubb and Villeneuve (1995), in addressing both issues, the combination of work-based and school-based activities would prove effective. In the initial co-op programme in 1906, Schneider enrolled 27 students. It earned many reviews and the next year saw more than 400 students making inquiries about and being admitted into the programme (Sovilla & Varty, 2004). The success of the programme quickly spread to other institutions and led to many inquiries about the University of Cincinnati’s innovative new co-op programme. The second cooperative education programme commenced in 1909 at the Polytechnic School of the YMCA Evening Institute (which became North-Eastern University). By 1920, a few other institutions and one technical institute had commenced cooperative education programmes, thereby highlighting its importance. Hence, cooperative education programmes acted as a bridge between lecture room and work activities (Sovilla & Varty, 2004).

4. Benefits of experiential learning/cooperative education

For the various stakeholders involved in experiential learning and cooperative education, there are various benefits. These include the following:

Benefits for students

By engaging in experiential education, students are presented with several opportunities to be knowledgeable about different jobs, construction industries and related occupations. These opportunities help students ascertain the strengths, weaknesses and expectations of their chosen careers and help in their exploration of possible options. The opportunities presented by cooperative education help students to apply classroom teaching, which further improves their learning process (Sattler et al., 2011). According to Omar et al. (2008), there is also an opportunity for students who participate in cooperative education programmes to be directly hired without an interview, into a professional position with their employer after graduation. Also, students who are fortunate to participate in cooperative education programmes gain valuable learning experience which enables a successful start to their careers (Wasonga & Murphy, 2006). Other benefits of experiential learning or cooperative education include improved social skills, increased practical knowledge and skills, marketability after graduation and improved understanding of the construction industry needs and expectations.

Benefits for higher educational institutions

A major benefit of cooperative education programmes to HEIs is the increased connection with the construction industry, leading to the output of higher quality students (Gault et al., 2000). HEIs benefit in two ways. Firstly, i HEIs have recruiting opportunities in which students participate, as well as direct placement opportunities for students who excel in the cooperative education placements. Secondly, it helps HEIs to stay in touch with the latest information and trends in participating industries (Divine et al., 2007). The second benefit is the fact that
cooperative education programmes contribute immensely to the overall educational pedagogy of their students. The activities allow opportunities for both programme and curriculum content improvement (Divine et al., 2007; Sattler, 2011). Therefore, experiential learning helps HEIs to remain relevant to students as they are pivotal in skill creation among students, thereby fostering successful transition into the construction industry. For HEIs, it can also encourage the value of diversity as its activities bring together students of different ethnic, social and economic backgrounds and prepare them for the world of work (Cantor, 1995).

Benefits for employers

Employers’ perceptions of the concept of cooperative education show that they engage in these programmes to improve their corporate image by hiring motivated new employees. This action by employers helps save the cost of operation and creates a more dynamic working environment (Coco, 2000; Knemeyer & Murphy, 2002). Braunstein and Loken (2004) report that employers benefit from cooperative education as it helps them source high-quality graduates to meet their needs. It further leads to increased awareness of innovative ideas in the industry (Gault et al., 2000).

5. Concept of internship

Over time, several sources of literature have elucidated the concept of internship and how it fosters construction education. For instance, Taylor (1988) defined internship as well-organised and career-related work experience acquired by students as part of their academic programme prior to their graduation. Pauze et al., (1989) and Knouse and Fontenot (2008) also concur that internship is an opportunity to provide students with field work or field experience which improves the students’ holistic understanding of various industry concepts taught in classrooms. This definition implies that internship gives students ample chance of integrating and consolidating what has been taught in lecture rooms. Kane et al. (1992), Gault et al. (2010) and Sattler (2011) further defined internship as a form of work experience which assists students in shaping their career objectives, individual values and enhancement of various skills through industry activities. The engagement of students in industry activities is vital as noted by Furco (1996) and Clark et al. (2011). It was stated that the fundamental concept of internship is that activities carried out by students enhance their learning process and understanding of various issues peculiar to their choices of interest. Callanan and Benzing (2004) described it as a positive opportunity for students to improve their learning as well as boosting their abilities to secure their dream jobs. This corresponds to the definitions by Wasonga and Murphy (2006) and Mihail (2006) which describe internship as vital in developing the in-depth academic knowledge, attributes as well as skills in students. Lam and Ching (2006) described it as a connecting bridge between the HEIs and the construction industry, providing students with the much needed first-hand experience of industry.
activities. Internship also provides students with a first taste of employment and supervision, according to Gault et al. (2010) and Sattler (2011).

For this study, internship can be defined as a well-structured and directed professional experience with an accredited job outfit for which a student earns academic units. This work experience usually involves a shift from an academic programme for a specified period and has little measure of academic content except for placement assistance. This definition of internship is confirmed by that of Robert et al. (2001).

6. Benefits of internship to students

Various studies have identified the benefits of internship programmes for students. According to Callanan and Benzing (2004), interns can make critical decisions based upon on-the-job experience. Studies also show that internship programmes lead to increased academic performance among students as they record higher grade point averages and fewer failed academic courses (Gault et al., 2000). Wasonga and Murphy (2006) comment that students’ interest and enthusiasm in the classroom are enhanced because of internship experiences. It also helps students understand the relevance of their coursework as internship experiences help in applying theoretical knowledge garnered from the classroom (Wasserman, 2008). After graduation, studies show that job prospects for students are improved as internships help in building a stronger résumé for job applications (Divine et al., 2007; Lowden et al., 2011). Studies also confirm that students who undergo internships display self-reliance, maturity, social skills, and confidence in their abilities to set goals and to attain them (Gill & Lashine, 2003; Mihail, 2006; Pillai et al., 2011). Clark et al., (2011) state that work experience illuminates students’ career choices upon graduation. Students appreciate the advantages that internship experience and learning provide as they face their impending job demands. Pillai and Yusoff (2007) opine that internships provide students with confidence during job interviews as those students who have undergone internships usually gain the preferred job offers.

Another noteworthy benefit from undergoing internship experiences is the development of the student's sense of self-efficacy. Self-efficacy is defined as the purposeful examination of one's abilities, skills and potentials in achieving results. It involves an assessment of one's strengths, weaknesses, interests and needs. Its objectives are to identify and focus on one's strengths to experience success. According to Ghayur and Churchill (2015), it is also the utmost confidence in one's ability to achieve a set out task and this can be achieved through internship experiences. The concept of self-efficacy is related to self-esteem and self-confidence which are simply students’ opinions of themselves. Thus, internships are guaranteed opportunities for students to develop self-efficacy beliefs. Likewise, the construction industry today seeks graduates who possess non-academic skills that are obtained and developed during construction internship activities. These skills include communicative skills, technical skills, time-management skills, and critical thinking skills, amongst others. According to Knouse and Fontenot (2008), internship is also essential in informing students about the expectations of the industry as well as their responsibilities in the
construction profession. Finally, internship provides monetary compensation for students as well (Gault et al., 2000).

7. Benefits of internship to higher institutions

The importance of HEIs in enhancing the industry workforce with the right skill set has earmarked it as a catalyst for economic growth (Hamdan et al., 2011). In supporting effective internship programmes, HEIs can enjoy positive effects on curriculum development, their financial resources and even the quality of student life (Gault et al., 2000). By expanding the range of educational opportunities for students, internships can lead to increased communication with various sectors of the community, particularly the construction industry (Divine et al., 2007). They also lead to curriculum content evaluation and academic programme improvement, as stated by Divine et al. (2007) and Sattler (2011). This benefit of internships keeps the curricula of HEIs up-to-date with the latest dynamics and requirements of the construction industry. It also offers direct learning experience to students through invaluable activities which can help HEIs develop a distinguished reputation (Robert et al., 2001).

8. Benefits of internship to employers

Employers of the construction industry engage interns for several reasons, but either first or second on their list is an early identification of potential long-term hires. By offering learning opportunities to students, employers have access to high-quality students who meet their expectations (Coco, 2000). They are also poised to obtain a pool of well-prepared employees who possess adequate knowledge of the construction industry with regard to its characteristics and challenges. Whilst providing an access to a younger generation of construction professionals, internships provide employers with an opportunity to evaluate employee training protocols (Sattler, 2011). By consistently providing internship opportunities for students, employers develop and maintain a positive reputation, strengthen linkages with HEIs and enhance human resource flexibility (Robert et al., 2001).

9. Internship as a pedagogical tool

From the preceding discussion, it can be inferred that internships are an exceedingly valuable tool that foster construction education, especially for young construction professionals (Pillai et al., 2011). It is widely known that the HEIs are regarded as the custodians of knowledge that help students step into industry reality with adequate preparation. Hence, Hendrie (2004) maintains that the various activities to be undertaken by interns should emphasise real work to reinforce their educational experiences. These activities provide students with the opportunities to
apply their developed abilities and understanding in a professional situation while still studying. These activities further present a well-tailored work experience giving students the job exposure which improves the holistic understanding of their specific fields. It is also important to note that internships develop connections between the intern supervisors from HEIs and the industry supervisors - those tasked with monitoring and evaluating students’ performances. The role of the intern supervisors is therefore essential in helping students adapt to the workplace needs, expectations, and norms, amongst others, thus providing excellent work-place orientation and supervision for interns.

10. Internship - a form of experiential learning

According to D’Andrea (2005), internships are a form of educational programme which provide students with industry exposure away from the conventional lecture rooms. This type of learning stimulated by an internship is experiential. It is based on active participation in which experience is fundamental. It involves learning and engaging in real industry situations where problem solving is stressed. Furthermore, it provides the opportunity to participate in both independent learning (on one’s own) and cooperative learning (guidance and support of others). In summary, the outcomes of this form of experiential learning stimulate new skills and competencies required by the industry. Some of the outcomes of internships include better interpersonal and communicative skills; understanding and displaying work values; developing organizational, technological, and report writing skills; learning the essence of time management; team-work collaborations; developing professional attitudes; developing leadership skills; and improving self-confidence, amongst others.

11. Research methodology

This research study was carried out with reference to extant literature published in conference papers, government reports and journals articles in order to review the various benefits of internship as a strategy in improving the quality of construction education. An extensive literature search was carried out over several weeks in March, April, and May 2016, covering the majority of academic databases, including EBSCO, ISI Web of Knowledge, Science Direct and Google Scholar. Construction databases searched include Associated Schools of Construction conference proceedings, Association of Researchers in Construction Management, Emerald, Taylor and Francis Online, Springer, and ICE Virtual Library. Three sources – Emerald, Science Direct and ASC – turned up mostly country and industry reports, an analysis of which confirmed that they did discuss issues relevant to the study objective. Critical observations were made and notes were taken on the various searches, and the encounters faced were recorded carefully. Next, the abstracts of the selected literature were re-read and ranked according to the authors’ perceptions of relevance and based on the inclusion/exclusion criteria adopted. A total of 95 articles/book sections were selected at this stage and exported to an Excel spreadsheet along with their abstracts. These were then re-read more carefully and a preliminary relevance ranking given as follows: v
(very relevant); v to m (very to moderately relevant); m to l (of moderate to low relevance); and l (of low relevance). The articles were subsequently ranked A, E, I, O and U by the authors and re-ranked separately by a colleague, with only a few divergences. Finally, the authors reviewed the rankings to come up with a final ranking. At this stage, it was also decided that only those ranked A, E, and I may be included in the review.

12. Lessons learnt

From the reviewed literature, the importance of integrating real-world experiences into the educational set-up for students was identified as a key component of students’ development in higher education. One of the approaches in ensuring a holistic educational provision for the students is through an internship. This form of experiential learning acts as a bridge between the lecture room set-up and professional practice, thereby improving their overall educational mindset. From a broad viewpoint, internships are beneficial not only to students but also the HEIs and the industry employers. This literature review focused on the benefits of an internship to students as it provides better quality education and broadens their educational horizon. The reviewed literature of Taylor (1988), Pauze et al. (1989), Kane et al. (1992), Furco (1996), Wasonga and Murphy (2006), Mihail (2006), Lam and Ching (2006), Gault et al. (2010), Sattler (2011) and Clark et al. (2011) confirmed that construction internships are beneficial to students in the following ways:

- Bridging lecture-room activities with professional settings;
- Increasing students’ exposure to ethical and professional matters;
- Solidifying the knowledge and information garnered during lectures;
- Developing students’ personal awareness and skills;
- Softening the shock of transitioning from classroom to industry;
- Enhancing the strengths and weaknesses of their chosen careers;
- Providing several opportunities for students to explore other related careers;
- Obtaining/Ensuring early employment after graduation;
- Understanding the needs and expectations of the industry;
- Establishing rapport between student and industry professionals;
- Providing opportunities for students to solve industry problems;
- Improving students’ critical thinking abilities;
- Creating an industry mentorship forum for students; and
- Creating a better understanding of global issues and social change.

It is the principal objective of HEIs to adequately prepare students with the requisite skills and knowledge to facilitate their introduction into the world of work. However, the dynamism of the industry means that graduates need to step up their development and be updated with the various intricacies of the industry to be able to meet industry needs. Gaining the necessary work experience helps the students’ development as well as the future of the industry. Overall,
internships today have been recognized as a pivotal avenue to link lecture room experience to professional practice, thereby improving the holistic learning of students. The construction industry today has very high expectations of graduates who need to possess not only a sound academic background, but also the necessary work experience to make them fit into the world of work after graduation. This work experience goes a long way in helping students explore various career opportunities and alternatives.

Further findings from literature revealed the following benefits of cooperative education:

- Results in an improvement of an individual’s skills, thoughts and values as it can contribute to personal and intellectual development;
- Results in good educational achievement and knowledge gained from the applied learning experience;
- Provides students with the opportunity to apply learned ideological frameworks to potential career settings in the real world;
- Broadens the future career opportunities of students through networking and establishing positive working relationships with their employers. These relationships cannot be established solely by taking classroom notes, but they can be constructed by combining the knowledge gained from the classroom notes with practical applications in a real-life setting; and
- Improves the general vocational and intellectual development as well as personal growth of students who participate.

13. Conclusion

This paper was instrumental in the contributing to the body of knowledge by examining a key strategy in improving construction education in the quest to develop better graduates for the future of the construction industry. A review of extant literature was conducted to explore the various definitions of internship and cooperative education as tools in enhancing construction education and their roles in preparing the future industry workforce for the world of work. The studies revealed that there are various meanings of these learning approaches, but the central tenant of the authors’ works centres on the fact that both provide construction students or graduates with an experiential understanding of the industry prior to joining the industry on graduation. Also, the reviewed literature pointed to a common phrase, namely ‘work experience’, which internship and cooperative education provide. Findings from literature revealed that internships provide students with the opportunity to appreciate the various

Further findings revealed that internship is an essential aspect of an educational degree, providing opportunities for individual development, realistic learning and skills development. These invaluable experiences can effectively change the lives of students as their self-confidence and maturity levels are ultimately improved. It is therefore recommended that HEIs should make
provision for students to undergo internships and also endeavour to be involved in the supervision of students in order to monitor and evaluate their progress. It is also essential that the construction industry should formulate programmes and activities that complement lecture room-based teaching and improve the overall education of the students. Industry should ensure quality supervision of students’ activities during the internship period and plan for students to be swapped round departments to ensure a holistic experience and the beginning of a life-long learning of the industry. The findings of this study are beneficial to both construction education institutions and their educators as well as present-day construction education students. The results of the study increase the need for construction educators in HEIs to re-evaluate their existing curricula in order to accommodate relevant work experiences which better prepare their students ahead of the rigours of the construction industry.

References


