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## Operational Impact in a Transnational, Work-Based Railway Operations Management Programme Through a Collaborative Approach

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### Introduction

This chapter outlines the benefits of a Transnational, University-to-Business (U2B), Work-Based Learning (WBL) programme to a parastatal organisation – Transnet Freight Rail (TFR) in South Africa. Since 2012, the TFR Railway Operations Management (ROM) programme has been delivered through a quadripartite partnership between Glasgow Caledonian University (GCU), Institution of Railway Operators (IRO), TFR and University of Johannesburg (UJ). Key programme aims encourage personal and professional development aligned to industry knowledge: “... to allow individuals with prior qualifications or significant

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work experience to complete a degree through linking academic studies to the challenges of the workplace” and “to support employees of the railway industry to develop a better understanding of the industry and its operations.” Therefore, this programme seeks to support business development through education of citizens in a state-owned enterprise.

Whilst Transnational Education (TNE) models often reflect a university-to-student model, either through a single ‘exporting’ university or collaboration with in-country partners (Knight and McNamara 2016), U2B programmes aligned to professionalisation (of individuals and industries) through a WBL educational philosophy offer a complementary approach to benefit host countries, their citizens and organisations; it is this U2B WBL approach that is explored in this chapter.

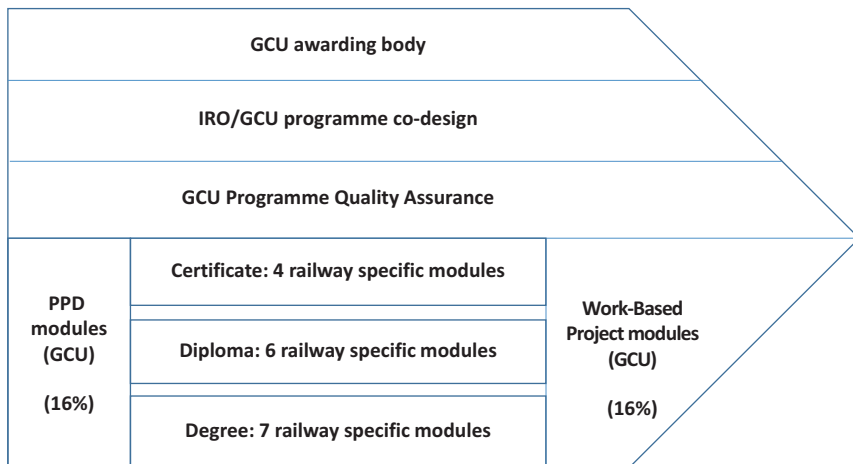
The next section sets the South African context and expands on the context of U2B TNE WBL programmes by reviewing literature and shows that this programme does not sit fully within existing frameworks/categorisations. Moreover, this positioning leads to using impact at an individual level as a key indicator. This insight informs an exploratory methodology. Subsequently, key findings from all partners around critical factors in the evolution of the programme from its first cohorts, through re-approval and extension to include Honours and Masters levels will be outlined along with the programmes’ impact.

## Context

South Africa is a progressive, modern, democratic nation that advocates the transformative role of education through strong government education expenditure (World Bank 2019). The value of education is also reflected in a progressive Higher Education sector with many universities with internationally recognised standings (TES 2018) and recognition of the contribution of Higher Education to social and economic development (CHE 2016). Since the end of Apartheid in 1994, sequential educational policy and regulation reforms have seen South Africa introduce the National Qualifications Framework (NQF) allowing portability of qualifications, policies around Recognition of Prior (informal) Learning (RPiL) and notions of lifelong learning (CHE 2007). These policies have supported South Africa in International Engagement (British Council

2016) as well as sought to ensure standards and regulation after the influx of many overseas institutions. In 2015/2016, South Africa retained its third-place African ranking (by number of students) with around 4000 TNE students, with most (3550) of these students studying through distance, flexible and distributed learning modes and most at postgraduate level – 2920 students (Universities UK 2016).

In this context of government policy development and increased internationalisation in education more generally in South Africa, Transnet Freight Rail recognised the importance of an international education programme to support its employees in the area of Railway Operations Management in 2010. The existing UK and Irish BSc Railway Operations Management programme offered by IRO and GCU was identified by TFR as the preferred model as it was a work-based learning programme combining railway-specific modules, emphasising personal and professional development and using work-based assignments, including a capstone work-based project at the end of each level of study (Fig. 12.1). Moreover, it was based on a partnership that was focused on the professionalisation of full-time employees working in Railway Operating Companies and delivered in a blended learning mode (mixture of focused



**Fig. 12.1** UK and Irish BSc Railway Operations Management programme at 2010: partnership and curricula model

face-to-face teaching sessions with distance learning though Virtual Learning Environment); professionalisation here reflects new professions with a shift in power (Evans 2008)– in this case a recognition of industry-specific expertise and the shift to an Entrepreneurial University model (Rhoades and Stensaker 2017). Furthermore, the flexible approach in the existing programme, students enrolling for just one level of study at a time at SCQF7 (Certificate), SCQF8 (Diploma) or SCQF9 (Degree), was supportive of both individual development as well as aligned to knowledge sharing across an industry sector. Figure 12.2 depicts the evolution of the programme from its origins in the UK to the adapted version for TFR with UJ bringing South African contextual knowledge to the partnership and providing the face-to-face delivery on the railway-specific modules and grading of assignments.

The nature of the TFR ROM programme presents a distinctive form of TNE. It is a hybrid of Knight and McNamara’s (2016) framework having features of independent (with GCU being the only awarding body) and collaborative provision (with joint delivery, contextualisation and a partnered quality assurance (QA) approach reflecting international academic standards between GCU and UJ, through the GCU QA processes). Such a unique model reflects the requirements of a TNE U2B WBL programme and means that a wider perspective on learner experience needs to be taken to reflect work-based learning.

Work-based learning is defined as “... a learning process which focuses university level thinking upon work (paid or unpaid) in order to facilitate the recognition, acquisition and application of individual and collective knowledge, skills and abilities to achieve specific accredited outcomes of

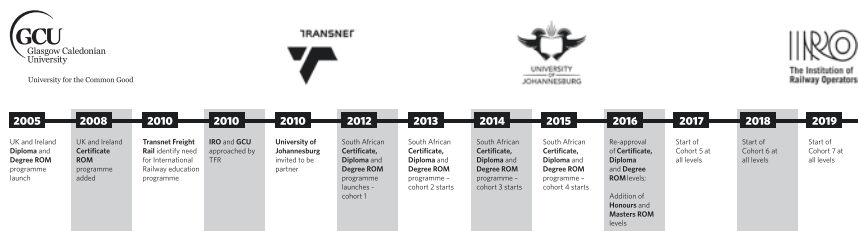


Fig. 12.2 Evolution of Railway Operations Management programme from UK and Irish version to current South African version for Transnet Freight Rail

significance to the learner, their employer and the university” (Garnett 2005). The learner takes a central role in work-based learning seeking to maximise their individual learning through critical personal reflection on experiences and engaging with contextual projects (Raelin 2000), which seeks to reduce any disconnect between educational outcomes and workplace needs (Blom 2013). Therefore, the teaching and assessment strategy needs to recognise heutagogical principles of flexibility and learner self-determinism (Hase and Kenyon 2003 cited in Felce 2010), as well as andragogical principles that emphasise that learning builds on experience, encourages problem-centred learning with immediate applicability to work and the learner’s intrinsic motivation (Youde 2018). So, in WBL programmes a key indicator is the learner’s self-perception of how they have developed personally and professionally within their workplace and how the learning programme has met their needs.

Whilst the above paragraph has emphasised the learner-centred aspect of WBL, typically WBL programmes are a tri-partite relationship between learner, university and employer. In the context of a work-based programme for one organisation – as for ROM – then ensuring that this individual learning is aligned to strategic employer needs is imperative, particularly when the organisation is sponsoring several hundred staff on the programme. Fernandez-Berruenco, Tauno and Devins (2016) highlight the importance of how the programme is designed and monitored and the critical role that the balance between the basic pillars of Organisations, Curriculum and People plays in effective WBL programmes. Fernandez-Berruenco et al. (2016, p. 44) label three key interactions between the basic pillars: “**doctrine**... always remembering the main goal of the programme: to maximize the students’ learning opportunities” [organisations-curriculum nexus], “**authenticity**... students should be provided with a real work environment... Tutors play a key role in ensuring the authenticity of the assessed work... Threats... include either over emphasising the programme details (forgetting the market and students’ needs) or giving too much importance to the people, leading to excessive clientelism or academicism.” [curriculum-people nexus] and “**culture**... the ‘glue’ between organisations and people. It refers to the way in which people in the participating organisations adapt their identity and their way of working to the WBL programme... The threat

[results] from... either in too much emphasis on people (clientelism, academicism) or too much emphasis on the organisation ...” Nixon (2008) highlights similar considerations in their study on the impact of WBL. As can be seen here, the partnership underpins any potential impact to individuals and to the partner organisations and these enablers will be used additionally to frame the evaluation of the ROM programme below.

## Methodology

A mixed method strategy using a descriptive case study approach has been utilised. A segmented longitudinal approach has been taken – phase 1 (cohort one to four) and then phase 2 (cohort five) after re-approval of programme – using a qualitative approach. Cohort 5 students at Certificate, Diploma and Degree levels were chosen for Phase 2 as students have just completed this level; Cohort 5 Honours and Master’s students and cohort six have been excluded as they are still mid-level and such mid-level evaluation is not consistent with the overall study design.

A combination of secondary data (from re-approval documents and associated evaluations), as well as primary data (through semi-structured reflective interviews, questionnaires and online surveys), have been utilised. For alumni from phase 1 a purposeful, stratified non-probabilistic sampling strategy was used. The sample of 16 employees chosen reflected: (1) employees who had studied just one level as well as students that had chosen to continue to the next level of studies, (2) students at different levels, (3) students starting their studies across all of the first four cohorts. A written questionnaire was distributed to these individuals with a focus on their experience and perceptions (around personal and professional development – PPD – and the impact of the programme on them in the workplace); follow-up interviews were offered to the students. The response-rate for the written survey for this group was 50% and two follow-up interviews were conducted. The written survey responses were inductively coded to generate key themes.

For cohort 5, an online survey was distributed to 168 students on the cohort at Certificate, Diploma, and Degree levels, eliciting similar perspectives as for the alumni in Phase 1. The overall response rate was 28%.

The responses at each of the three levels was proportionate to the number of students enrolled at each level so the sample for each level was similar at around 30%. Subsequently, both the Likert scale questions were analysed per level and the free-text questions were inductively coded (using a similar coding framework as developed for the written survey responses from the earlier cohort students).

Additionally, representatives from each of the four organisations that make up the quadripartite partnership were invited to be interviewed about their perspective on the ROM programme; six interviews were conducted. Interviews were transcribed and then inductively coded.

Questionnaires and online surveys were collated – with Likert style questions being analysed using descriptive statistical methods and written text being coded and emergent themes identified.

Limitations of this study design include the low sample size for phase 1 although convergence was seen within those responses and the emergent themes were similar to data obtained from the large sample size of the Cohort 5 online survey.

The four-step programme cycle of Fernandez-Berruenco, Tauno and Devins (2016) – market needs, design and planning, delivery and evaluation – will provide a framework in which to review the evolution of the programme as well as consider the evaluation and impact that the programme has had.

## Phase 1: Cohorts One to Four

Firstly, the market need was for a programme that supported the strategic needs of TFR to be amongst the top five railways globally. Such a need required the company to invest in its people to develop employees with enhanced railway-specific operations management knowledge, particularly among those with supervisory and management responsibilities. In that context, an internationally respected qualification was required to bring best practice, as well as an approach that had immediacy and “*bridged the chasm between theory and practice*” as well as “*to close the gap*” between functional knowledge and experience and effective railway managerial capabilities. Moreover, the programme needed “*to provide critical*

*thinking... to enable problem solving... and employees should directly apply what they have learned.*" Such an approach was through the existing UK and Ireland ROM programme (as outlined above) as it provided a work-based railway-specific qualification. A pilot cohort of 150 students was identified (cohort 1) with subsequent cohorts of around 240 students per cohort. Students admitted onto the programme had gone through an individual company development-needs assessment and through a criteria-driven, open application process in TFR, with the number of interested applications being typically three to four times the available places (which were dictated by allocated budgets). One alumnus commented, "*This is an opportunity [to study] for which I will always be grateful...*", which reflected a broad feeling of privilege felt amongst the alumni surveyed.

The design of the programme remained constant in the first phase of the programme, although there were adaptations to the learning materials as the programme evolved. For cohort 1, TFR were keen to adopt the existing UK and Ireland programme design as closely to the existing version as possible which resulted in only minor changes being made to the existing module descriptors, e.g. replacing learning outcomes and syllabus in the railway-specific modules from references to UK and Ireland to references to South Africa. The materials used in the face-to-face teaching as well as the core texts (reading material authored by IRO) were adapted by UJ academics to ensure that they were relevant to the South Africa operating environment, predominantly freight rather than passenger rail as well as different infrastructure standards and equipment. Of note, was the peer review process that took place with TFR Senior Operational Managers of these materials to ensure relevancy to the operations environment and to the desired needs. Additionally, the assignments were adjusted to reflect the context and operating conditions of TFR and South Africa. For the later cohorts the materials continued to evolve as noted by one of the alumni, "*I think the team has improved tremendously with local content... but again not neglecting the international concept of managing railways and improving KPIs using technology.*" One of the partners commented that "*the willingness... of GCU, and the IRO for that matter, to allow some changes to be made to the programme running in the UK... was a great advantage to TFR.*"



From the planning perspective, the requirement to adapt the UK and Ireland curriculum to South Africa also brought advantages, as UJ identified suitably qualified individuals that had the required theory-practice knowledge and experience to undertake this work. These UJ academics were subsequently involved in the delivery, so already had a working understanding of the programme approach and modules. Moreover, the communication between all partners during this process development fostered positive working relationships. Additionally, employing key individuals at each of the partners at an early stage to provide leadership and management of the programme was fundamentally important to its subsequent success. At GCU, the recruitment of a full-time programme leader to co-ordinate all the activities and ensure the overall programme was vital. All partners identified the importance of communication and the relationship, with TFR commenting “*One of the major reasons for success of this programme lies in the partnership ...*” and UJ commenting “*...whenever there was contact or questions asked, it was always dealt with from GCU’s side in an extremely collegial manner... it made it much, much easier to get into the programme and to execute the tasks which we had agreed to in the contract.*” This core team provided a nexus that made the programme work operationally and simplified the lines of communication.

The delivery pattern of one module studied sequentially in a blended learning format with two days of face-to-face time per module remained constant over Phase 1. However, the programme delivery has evolved with one GCU academic commenting that “*there was a big learning curve from the first cohort.*” One key shift was in the move from three teaching centres after the induction and first module of cohort 1 to a centralised delivery model from module 2 of cohort 1 delivery; the pattern was adjusted as the most optimal facilities were in one location and it simplified the logistics and brought a consistent learning experience for all students on the programme (Mills and Tuff 2012). Additionally, GCU and UJ highlighted that (in cohort 1) a challenge was gaining an understanding of the different cultural approaches and student expectations but solutions were found by the partners. As the communication and understanding developed, as one GCU academic commented, “*we learned to be proactive to the students’/partners’ needs.*”

The programme has delivered benefits to the individual students (Table 12.1) as well as impact to TFR as an organisation. A TFR Executive Manager commented that ROM is selecting the potential stars within the organisation and providing them with the required knowledge to be future managers (so helping with succession planning), a comment mirrored by one alumni, “*the current participants [in ROM] within my team are showing interest in understanding other functions in and around our operating division and are starting to engage more. This makes it easy for me to start working on my succession plans and match their strengths with critical functions.*” Students are finding opportunities and problems in the workplace in their current roles, asking challenging questions in their teams and finding solutions through their new knowledge and skills around best and leading practices. Moreover, their increased understanding of the value chain (and its interdependencies) and customer value is bringing a new mind-set that is supporting the strategic direction and aligns with the values of TFR. Potential unintended benefits are being seen within the organisation – the blended learning approach is developing wider digital skills, not just for the students but in their depots and offices. In 2014 at the first graduation ceremony for ROM Brian Molefe (Transnet CEO) indicated that the graduates should be “rail votaries and teachers” and saw them sharing knowledge and acting as role models in the company and the wider community. He also indicated immediate and tangible benefits from graduates with improved performance and productivity (Creamer Media 2014). The responses from the alumni indicate that is exactly what they are doing.

In phase 1 of the programme, alumni’s self-perception of the programme was exceptionally positive with clear personal and professional benefits. Moreover, there are communities of practice and informal support groups being established by these alumni that are supporting a new way of thinking and working within TFR. These results have been achieved through a deepening partnership that has delivered the required doctrine, authenticity and culture.

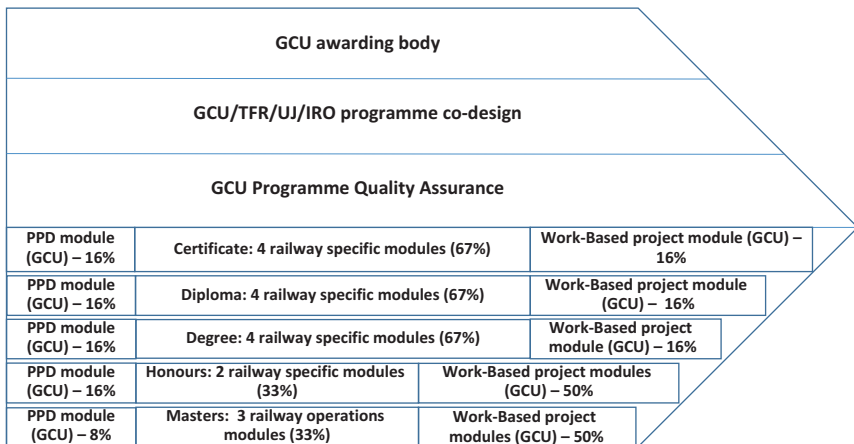
**Table 12.1** Personal and professional benefits evident from Phase 1 alumni responses

Theme	Representative quotations
Increased confidence	<p>"The confidence it brought in my professional life, as well as in my personal space, can never be explained"</p> <p>"I have gained the confidence to tackle any issue related to my job"</p>
Social learning benefits	<p>"It has allowed me to learn good performance principles from other colleagues"</p> <p>"The team allows us to interact with each other in solving problems or discussions"</p> <p>"Providing support and encouragement to other learners"</p> <p>"...gives the participants the opportunity to learn from colleagues that have a lot of practical experience in rail operations ..."</p>
Value chain awareness	<p>"ROM program allows you to see thing from a different perspective as you are forced let go of the silo mentality as it allows you to explore all other stakeholders in and around your working environment and their contributions to your day to day functions"</p> <p>"With the interaction with other colleagues I learned the different challenges they experience on their positions..."</p> <p>"...helps us a lot because we get to understand the working of different areas and departments and relate to the daily issues encountered."</p>
Personal opportunity	<p>"I have also gained respect from my fellow colleagues for being the only degree student in my depot"</p> <p>"The other change that occurred after participating in the programme is that people tend to listen when you express an opinion regarding operations."</p> <p>"all this landed me a senior leadership/management position..."</p>
Programme relevancy	<p>"The course covers every aspect of Railway operations..."</p> <p>"The content was relevant and for any employee pursuing a career in rail operations in Transnet, it's a must do."</p>
Work-based programme benefits	<p>"Integrates the practical and academic aspects of one's output"</p> <p>"Implemented project and achieved desired results."</p> <p>"Reflecting has been one of my favourite parts of the learning as I am now managing my problems and challenges by reflecting daily."</p> <p>"It is flexible for working students because you study while you work, you don't need to take leave for attending lessons or study leave for writing exams."</p>

## Re-Approval and Phase 2

In 2016/17, the market need was re-established through new multi-cohort funding being secured and the programme going through a GCU programme re-approval. Honours and Masters levels were added and were “*market driven,*” reflecting the strong recognition of the value of the ROM programme and its graduates within TFR, a thirst from graduates at degree level for further studies and a desire from senior and executive management to engage with a Railway Operations, internationally-recognised qualification.

The design of these Honours and Master levels continued to reflect a strong work-based focus; each level starts with a Personal and Professional Development module that facilitates students considering their personal and professional learning goals for that level of study. Subsequently, 50% of credits at both levels are negotiated projects to allow the student to bring both personal and professional development whilst addressing company-relevant projects and opportunities (often those they may have identified in the PPD module). See Fig. 12.3. In contrast to the Certificate, Diploma and Degree admissions, where RP(i)L is used for entry, applicants to Honours must hold a degree-level qualification and for



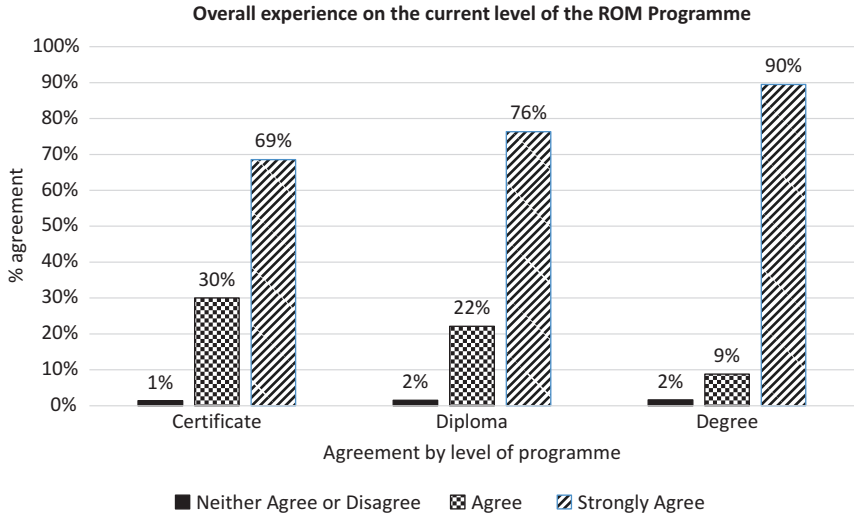
**Fig. 12.3** Transnet Freight Railway suite of Railway Operations Management programmes at 2016/17: partnership and curricula model

Masters and Honours qualification. The design of the existing levels (Certificate, Diploma and Degree) evolved, consistently having six modules per level and an opportunity to further balance the South African and global aspects within the railway-specific modules.

The planning resulted in the expansion of the teams at GCU and UJ including new programme leaders for Honours and Masters levels and GCU Academic Development Tutors to support students with their individualised academic development. IRO created the new core learning materials at Honours and Masters levels for the railway-specific content to GCU academic standards and UJ again provided the South African contextualisation. TFR Champions (Senior Managers within the organisation) were appointed to connect ROM more strongly to TFR management, particularly around choice of projects at Honours and Masters level so that projects were strategically aligned to business needs (as well as individual development). To co-ordinate the increased activities, Programme Boards are being held three times a year with full representation from all partners and students. Additionally, 'One Team' events are being held at least twice per year in South Africa with partners to support ongoing professional and programme development and knowledge sharing.

The delivery model follows the same pattern as for Phase 1 (sequential module delivery at one centralised location) but the module duration increased to 16 weeks. The only exception to the single module at a time is at Masters level, where two modules are sometimes taught at a time (but always 30 credits), which support a work-study-life balance.

The overall experience of students in Cohort 5 (first group of students on the new programme design) has been extremely positive (Fig. 12.4). It is interesting to note that whilst satisfaction is consistently high (>98%), the strength of support for their experience increases from Certificate to Degree level which broadly reflects a stronger self-belief and a sense of empowerment to solve problems creatively within the workplace. In free-text answers, students indicated that their self-perception of the benefits of the programme had been similar to students in Phase 1 (Table 12.2): increased confidence, better understanding of the business and its interdependencies, personal impact as well as organisational benefits. Additionally, the students have highlighted the value of the PPD modules, the work-based project modules and the railway-specific modules;



**Fig. 12.4** Cohort 5 students’ overall experience at Certificate, Diploma and Degree levels

the programme is highly relevant, balanced and enables students within the workplace.

Students who have studied previously have commented positively about the enhancements to the programme, “*I could see the different level between the diploma and the degree ... the student support [ADT] was a new addition and was very helpful at the degree level.*” This is supported by TFR, “*ROM has grown leaps and bounds,*” and to such an extent that interest in participating in the programme is coming from other African countries and organisations. For TFR, ROM is helping to create a critical mass of change makers within the organisation and has created a growing talent pipeline of employees able to solve the complex problems that exist in any railway operation in an effective manner. The realisation of the value of ROM is beginning to influence job profiling with TFR with the desire to make a particular level of ROM required for certain positions within the organisation. TFR does recognise that in any changes to job descriptions it will need to support all employees in that position to access ROM and, consequently, there may be an increased demand for ROM.

**Table 12.2** Themes and representative quotation of Cohort 5 students' self-perceptions around ROM programme

Certificate – Theme	Representative quotations
Increased confidence	"I now have confidence in myself and I understand my company more. I know that my input in this company is valuable and by me adding my input it helps TFR."
Social learning benefits	"It was a great experience being a student again, meeting different colleagues and interacting and sharing different views for different business units."
Value chain awareness	"Have a better understanding about operations in Transnet and the importance of customer service. To have good communications with all the relevant stakeholders." "Learning to think beyond the current processes and rules of the rail environment. Prior to the program I just accepted that the rail environment should remain the same and not change. Partnerships with other modes of transport never crossed my mind."
Personal opportunity	"Meeting the head of school of rail and the CEO in class and hearing their words of encouragement." "I now have a different view and approach to Railway business and great potentials can be realized, if all Railway people can open our minds. I can now be confident in my daily execution of tasks." "I am able to further my studies by making reference of my experience I have gained throughout my career."
Programme relevancy	"It has been a great experience and I'm going all the way to the last level of studying (masters)." "The entire course was an eye opener for me. The fact that the presenters was chosen for their knowledge and experience make it a very powerful programme."
Work-based programme benefits	"Learning about the different forms of learning and how they are defined, and how they apply in my everyday life experiences through learning outside the company and within the company." "Work-based Project is more fruitful as I am now knowing how to check for things that affect the business to grow and come up with possible solutions to see TFR be a profitable business and be able to achieve its mission and vision".

## Conclusions

This unique case study of a Transnational, Work-Based Education in South Africa at undergraduate level has clearly demonstrated its impact. It is providing tangible personal and organisational benefits through a flexible educational model (one-level-at-a-time, one-module-at-a-time, use of RPiL for entry, sequential module delivery) that is railway-focused and provides an immediacy of learning back into the organisation. The impact of the programme is demonstrated at individual level (increased self-efficacy) that is impacting TFR by developing a critical mass of employees capable of solving complex and interconnected railway operations challenges and has helped greatly with internal succession planning and talent management within TFR. The value of ROM to TFR is reflected in the demand for places every year exceeding available funded places, increased respect for ROM graduates within the organisation and the consideration of having a ROM qualification for certain positions in the future. At the heart of enabling this success has been the deepening partnership between GCU, IRO, UJ and TFR, based on common shared visions and a set of values; ROM is what higher education should be about, namely enabling individuals to develop themselves to be better citizens using lifelong learning to enable change at a personal, social and a wider economic level. As one TFR Executive Manager expressed, “this is an amazing programme and unique in the continent.”

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