The Adoption of Innovative Approach in Research Proposal Development in the Management Sciences of the Higher Education Sector

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ABSTRACT

Several innovative factors transforming higher education provide opportunities of changing its context. This influence the sector to continuously learn new ways of conducting business and introduce innovative methods in its post- graduate research-based teaching. Thus, the future of academia in Higher Education lies in the continuous search for innovative methods of evaluating students' research proposal. This sentiment underpins the significance of the Research Proposal Evaluation Tool (REPRET). REPRET is a computer-based innovative tool that assists emerging research supervisors (or promoters) in the management sciences in evaluating students' research proposals effectively. It has built-in functions that provide technical and methodological guides regarding students' proposals. It assists students in improving the quality of their research proposals, the efficiency of research proposal development, as well as throughput. It is a Microsoft Excel-based tool managed by the research supervisor (or promoter), covers various sections of the research proposal and is compatible with quantitative, qualitative and mixed paradigms. The contribution of REPRET as an innovative tool relies on higher education's ability to adapt to new processes. REPRET represents an innovative practice in education. It helps the higher educational sector, particularly the management sciences, to achieve competitive advantage and higher performance.

Keywords: - higher education sector, management sciences, research innovation, research proposal evaluation tool (REPRET), throughput

INTRODUCTION

Education, being a social institution serving the needs of society, is indispensable for society to survive (Jiang, 2015). It should not only be comprehensive and sustainable, but must continuously evolve to meet the challenges of the fast-changing and unpredictable globalised world. This evolution must be systemic, consistent and scalable (Serdyukov, 2017). Hence, academics are expected to innovate in the theory and practice of teaching and learning, as well as all other aspects of education to ensure quality preparation of all students. This sentiment underpins the significance of innovation in education.

Innovation can be regarded as the key that higher education institutions can use to respond to technological advances and changes in both social and cultural values (Ahmad, 2015). Educational institutions must therefore be "change-resilient" and continuously improve their

practices and methods of delivery (Weller & Anderson, 2013). In the educational context, innovation often lies in teaching, with "newness" as an essential ingredient (Hauser & Hauser, 2011, such as the use of novel methods in curricula, content and pedagogy (Lee, 2011; Smith, 2011; Zhu, 2013). The use of innovative tools in teaching has been practised in various ways, including technology that is often adopted as a support mechanism for the delivery of new teaching methods (Zhu, Wang, Cai & Engels, 2013). These include cloud-based applications and electronic whiteboards (Lee, 2011); student response systems in the classroom (Choi, Lam, Li & Wong, 2018; Lantz, 2010); mobile devices for in-class and out-of-class activities (Li, Lee, Wong, Yau & Wong, 2018); and learning analytics to evaluate and improve teaching effectiveness (Wong, 2017). Zhu et al. (2013) specify technological competence as one of the major competencies required in innovative teaching.

CHALLENGES IN RESEARCH PROPOSAL EVALUATION PROCESS IN THE MANAGEMENT SCIENCES

On a number of occasions, students developing research proposals often end up with a myopic view of their work, failing to consider what the reviewers of the proposal will be looking for (Wong, 2017), and consequently their proposals fail to answer major questions or provide insufficient information. Similarly, emerging research supervisors (or promoters) fail to identify such mistakes made by research students. As a result, students end up taking longer to complete their research proposals than stipulated, thus missing the deadlines for completion, making the proposal ineligible, regardless of how well it is written. This is where REPRET plays a critical role by helping emerging supervisors (or promoters) effectively guide students involved in research proposals towards efficient completion.

REPRET is a computer-based innovative method that assists emerging research supervisors (or promoters) in the management sciences to evaluate students' research proposals effectively. Bell (1998) describes management sciences as the discipline that adapts the scientific approach for problem solving in order to help managers make informed decisions. In education, it prepares students for applying scientific methods that address problems and decisions that arise in the business community and other organisations, such as the government and private sector.

There is a considerable body of literature on the discipline of innovation and innovation management (Adams, Bessant & Phelps, 2006; Crossan & Apaydin, 2010; Ortt & van der Duin, 2008), yet it is scanty in relation to innovative education, especially in areas of research development. Even more fragmented is literature in the domain of higher education (Jarvi, 2012). An extensive literature search has identified a definite gap in the body of knowledge relating to the development and innovative evaluation of research proposals, and this research aims to bridge that gap. To date, there is no widely recognised and accepted innovative research evaluation methodology in the literature. Hence, the purpose of this paper is to present an innovative research evaluation tool for use in postgraduate settings in the management sciences in higher education.

It addresses the following areas:

- REPRET as an innovative approach that assists emerging supervisors (or promoters) in evaluating research proposals for post-graduate students enrolled in the management sciences
- presents the significance of REPRET as an innovative practice for improving students' quality of research proposals and throughput
- REPRET provides a structural and systematic approach in research proposal evaluation.

The rest of the article discusses literature review, the design process and the specification of REPRET, technology used in the application of REPRET, REPRET as a valuable assessment tool for emerging supervisors (or promoters) in the management sciences, performance outcomes from REPRET, the discussion, as well as the conclusion.

LITERATURE REVIEW

The literature relevant to innovations in research and teaching covers a broad range of areas including the overview of innovation in research, innovation in the educational environment, implementing innovative activities in the Institutions of Higher Learning, and the design process and specification of REPRET.

Overview of innovation in research

A number of authors have conducted studies on innovation in research, including Smith (2011) and Zhu (2013). Hofman, Jansen and Spijkerboer (2011) have also investigated differences between school leaders and teachers and their perceptions of impediments towards innovations, showing that teachers regarded factors such as a lack of sufficient support, a lack of proper educational tools and an unfit organisational structure for innovation as contributing towards a bottleneck. They claimed that such bottlenecks would be more visible in institutions in developing countries with a shortage of resources and teachers. Another category of related studies has focussed on the drivers of successful innovations in teaching and research. Here Smith (2011) identified external and institutional rewards, as well as recognition, as the key drivers of innovation in teaching, learning and research. Support from senior management and the availability of technical support for both short- and long-term research projects are also important for the sustainable development of institutional innovation. Lunde and Wilhite (1996) identified the key characteristics of teachers who are innovative, namely, having passion, persistence in improvement, being attentive to students, the use of active learning, risk-taking and keeping themselves vital. Lee (2011) investigated how the integration of information technology into research and teaching activities contributes to learning effectiveness. The results showed positive and significant effects on student's learning effectiveness. Hence, this paper presents the significance of REPRET as an innovative method for improving students' quality of research proposals and throughput.

Innovation in the Educational Environment

Innovation refers to looking beyond what is being done and developing a novel idea that helps do the job in a new way (Donovan, Maritz & McLellan, 2013). The purpose of any invention is to create something different from what has already been done, be it in quality or quantity,

or both. To produce a transformative effect, the innovation must be put to work, requiring prompt diffusion and large-scale implementation. Innovation, generally understood as the successful introduction of a new thing or method (Brewer & Tierney, 2012), has in essence two sub-components. Firstly, there is the idea or item which is novel to a particular individual or group and, secondly, there is the change that results from the adoption of the object or idea (Evans, Thompson, O'Brien, Bryant, Basaviah, Prober & Popart, 2016). Innovation therefore requires three major steps: an idea, its implementation, and the outcome that results from the execution of the idea and produces a change. In education, innovation can appear as a new pedagogic theory, methodological approach, teaching technique, instructional tool, learning process or institutional structure that, when implemented, produces a significant change in teaching and learning, leading to better student learning (Harte & Stewart, 2012). Innovations in education are intended to raise productivity and efficiency of learning and improve learning quality. Efficiency is generally determined by the amount of time, money, and resources that are necessary to obtain certain results (Maritz & Brown, 2013). Innovation can be directed towards progress in one, several, or all aspects of the educational system: theory and practice, curriculum, teaching and learning, policy, technology, institutions and administration, institutional culture, and teacher education (Ahmad, 2015). Similarly, educational innovation concerns all stakeholders: the learner, parents, teacher, educational administrators, researchers, and policy makers and requires their active involvement and support (Jung, 2011).

Innovation can be assessed by its novelty, originality, and potential effect (Maritz & Brown, 2013). As invention is typically time-consuming and cost-demanding, it is critical to calculate short- and long-term expenses and consequences of an invention. It must demonstrate significant qualitative and quantitative benefits. As psychologist Mihalyi Csikszentmihalyi writes, "human well-being hinges on two factors: the ability to increase creativity and the ability to develop ways to evaluate the impact of new creative ideas" (Csikszentmihalyi, 2013: 322). In education, institutions can estimate the effect of innovation via learning outcomes, formal and informal assessments, and student self-assessment (Zhu, 2013). Innovation can also be computed using such factors as productivity (more learning outcomes in a given time), time efficiency (shorter time spent on studying the same material), or cost efficiency (less expense per student on data) (Abeyta, 2013). Hence, REPRET is an innovative approach that assists emerging supervisors (or promoters) in evaluating research proposals within a given time-frame for better outcome.

Implementing innovative activities in the Institutions of Higher Learning

It is a known fact that higher education has been historically slow in adopting innovations (Evans et al., 2016; Hoffman & Holzhuter, 2012; Marcus, 2012). Originating in its complex and labour-intensive structure (due to cohesion and continuity of science), higher education is particularly difficult to make more productive (Brewer & Tierney, 2012). It seems that the systems and values of industrial education were not designed with innovation and digital tools in mind. Innovation, whether it is with technology, assessment or instruction, requires time and space for experimentation and a high tolerance for uncertainty (Heick, 2016). This holds true for innovation in research activities in Higher Education institutions as well. Disruption of established patterns is the *modus operandi* of innovation (Levasseur, 2012). However,

innovation is difficult to introduce into academia as it disrupts the established routine and pushes implementers out of their comfort zones (Jiang, 2015). In many instances, innovation in research in educational institutions does not take priority over pressing routine issues. Nonetheless, it is of paramount importance to accept that innovation in research is linked to creativity, risk-taking, and experimentation (Brewer & Tierney, 2012), which must be a part of the education system.

Innovation is not about "talking the talk but walking the walk" (Zhu, 2013). An innovation can make a significant difference only when it is used on a wide scale. To create innovations is not enough: they need to be spread and used across universities. For the innovation to have a sizable effect, institutions need an army of implementers together with favourable conditions for the invention to spread and produce a result (Cuban, 2015). Implementers, in turn, have to be creative and motivated to do their jobs and must also have freedom to innovate in the implementation, security on the job to take risks, and control of what they are doing. Ultimately, they need to be trusted to do their jobs. That is, there must be an innovation-receiving system (Evans et al., 2016), or a change zone (Polka & Kardash, 2013). A growing trend in higher education is a market approach, where the main goal is set for meeting the demands of the student population (Afshar, 2016). Universities are busy trying to increase students' satisfaction and create exceptional, premier, or extraordinary learning experiences instead of caring about their true knowledge and quality achievements (Cuban, 2015). This is clearly an extension of the adaptive or differentiated approach to teaching and learning, leading to customisation of education (Schuwer & Kusters, 2014). Institutions that depend on enrolment for their revenue appear more willing to innovate than traditional, public universities that enjoy government support. Hence, innovation is likely to vary according to several characteristics, which include type and size of institution, market niche and resources (Brewer & Tierney, 2012). Clearly, private institutions are more adept at innovating than public ones. The market is a powerful factor, however, and the changes it effects may have to be tackled cautiously. Innovations grow in a favourable environment, which is cultivated by an educational system that promotes innovation at all levels and produces creative, critical-thinking, self-sufficient, life-long learners and problem solvers.

DESIGN PROCESS AND THE SPECIFICATION OF REPRET

REPRET is a computer-based innovative tool that assists supervisors (or promoters) in evaluating research proposals. It has built-in functions that provide methodological guides regarding a student's proposal. The following Figure 1 presents REPRET index page with different icons used by emerging supervisors (promoters) in accessing different sections for data input during research proposal evaluation.

Figure 1: REPRET index page with icons for accessing data inputs during research proposal evaluation
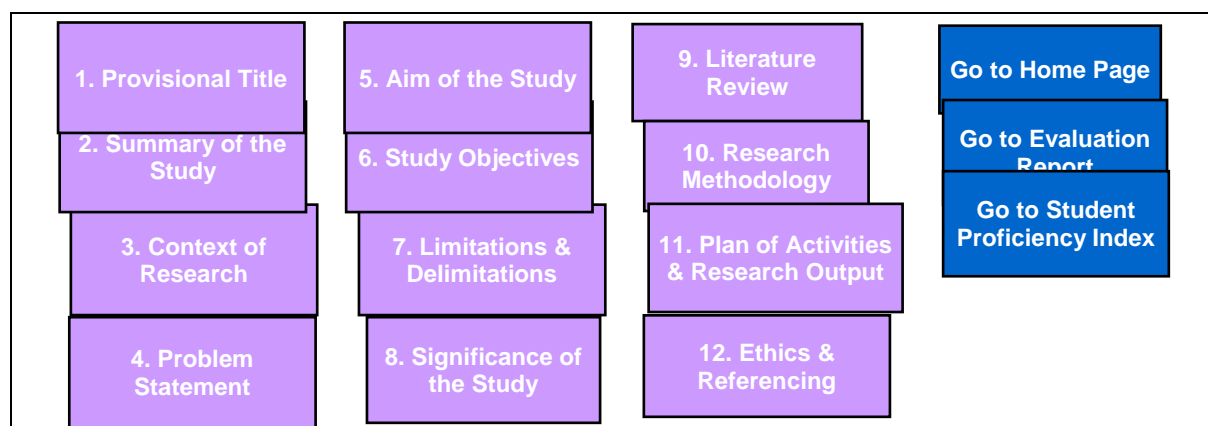
Source: Author's design of the index page

The index page assists emerging supervisors access data input sheets in various sections of the research proposal. Sections includes the provisional title, summary of the study, context of research, problem statement and study objectives. It helps them expand on their evaluation on study limitations and delimitations, the significance of the study, literature review, research methodology, plan of activities and research output, as well as ethics and referencing. Technically, REPRET assists emerging supervisors to articulate to various Excel spreadsheets including the home page, evaluation reports, as well as the Student's Proficiency Index (SPI).

REPRET provides a structured approach in students' research proposal evaluation processes and enables the supervisor to identify areas for improvements in the student's research proposal. It is compatible with quantitative, qualitative and the mixed methods.

TECHNOLOGY USED IN THE APPLICATION OF REPRET

REPRET uses a computer for effective evaluation. The use of computers increases productivity and lessens the evaluation time, resulting to an increase in students' throughput. The computer application for REPRET is Microsoft Excel, using a spreadsheet programme. Hence, REPRET provides a checklist in excel application thus structuring the evaluation process. The organisation of REPRET in excel application improves efficiency of evaluation as compared with the traditional manual process. This results to an increase in throughput.

REPRET AS A VALUABLE ASSESSMENT TOOL FOR EMERGING SUPERVISORS (OR PROMOTERS) IN THE MANAGEMENT SCIENCES

A variety of contextual approaches are identified in education programmes, ranging from higher education institutions (Neck & Greene, 2011), training and development (Jones, 2010), vocational education (Jarvi, 2012), non-business disciplines (Jones, Matlay & Maritz, 2012), competitive offerings and culture (Rae, 2010), student and educator diversity (Jones, 2010), skills, knowledge and attitudes (Matlay, 2008), type of innovation (Crossan & Apaydin, 2010), teaching methods and pedagogy (Fayolle, 2010) and evaluation (Harte & Stewart, 2012). REPRET is the type of innovative tool that improves the quality of students' research proposals, the efficiency in the evaluation of students' research work, as well as the throughput.

It neither replaces supervisors' (or promoters') intuition and related expertise, nor the students' creativity. The following Figure 2 presents the structure of one of the data input sheets for REPRET.

Figure 2: structure of one of the data input sheets for REPRET

Legend: Number (i) represents the top part of the template, arrow in (ii) indicates that the template has numerous sections up to the last section in (iii)

Source: Author's 'example' on how the input data sheets are structured

REPRET provides a structured approach of research proposal development. It is an assessment used by the supervisor (or promoter) (with questions presented in self-evaluation format) based on facts that enable the student (through subsequent feedback) to improve the quality of the research proposal. It evaluates various sections of the research proposal and covers, amongst others, the research title, summary of the study, the study context, problem statement, aim and objectives, limitations and delimitations, study rationale, literature review, research methodology, ethical considerations, as well as the reference method used. During proposal evaluation, cardinal numerals represented by one (1) for affirmation and zero (0) for incorrect (and /or inconsistent) student's input are used. The programme also allows the supervisor to incorporate additional comments on any inconsistent student's input. The assessment outcomes (including supervisor's comments) are aggregated into a comprehensive report that

is shared and discussed with the student. Hence, the evaluation report presents the research proposals' strengths and weaknesses for improvement.
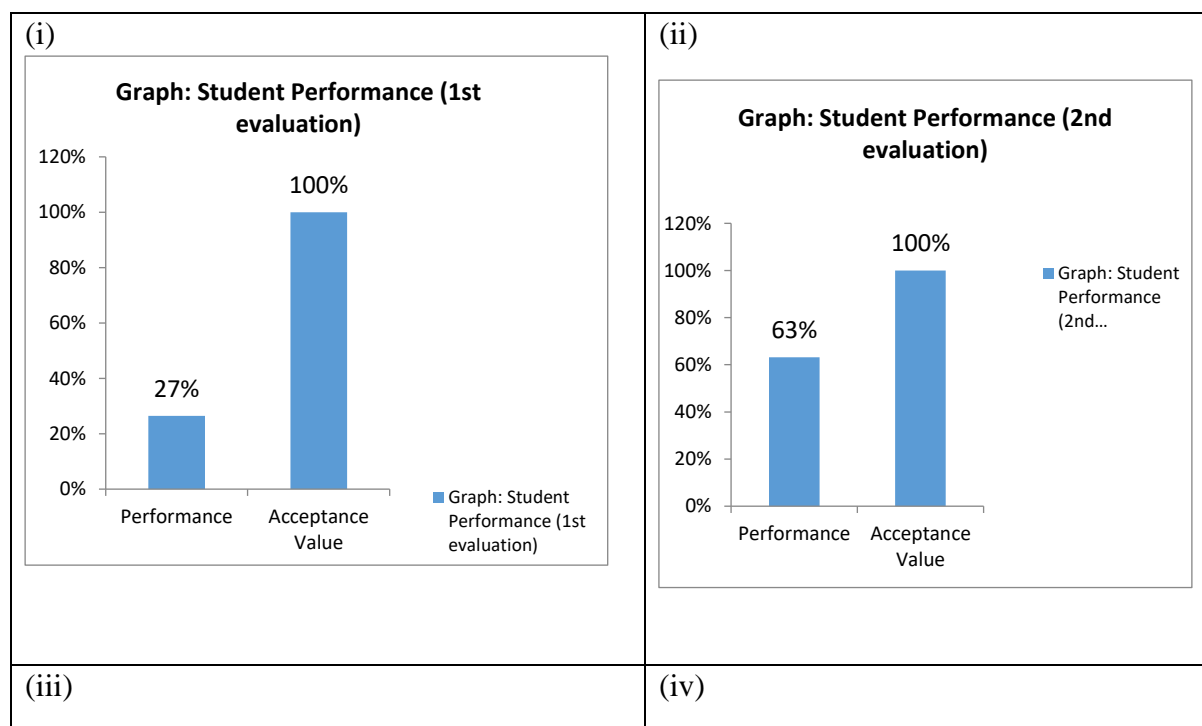
PERFORMANCE OUTCOMES FROM REPRET

In education, efficiency of learning is determined mainly by invested time and cost (Jiang, 2015). Learning is more efficient if recipients achieve the same results in less time and with less expense. This is what REPRET offer emerging supervisors (or promoters) and their research students. It improves students' productivity through the achievement of quality research outputs within the standard set time.

REPRET was tested to 21 master's students that were involved in research proposal development. Students were able to get their feedback within an agreed time. The feedback (both positive and negative) provided proper direction for students to improve the quality of their research proposals.

Figure 3 presents examples of a student's performance outcomes from individual research evaluation sessions (i) to (iv).

Figure 3: example of student's performance outcomes from individual research evaluation sessions
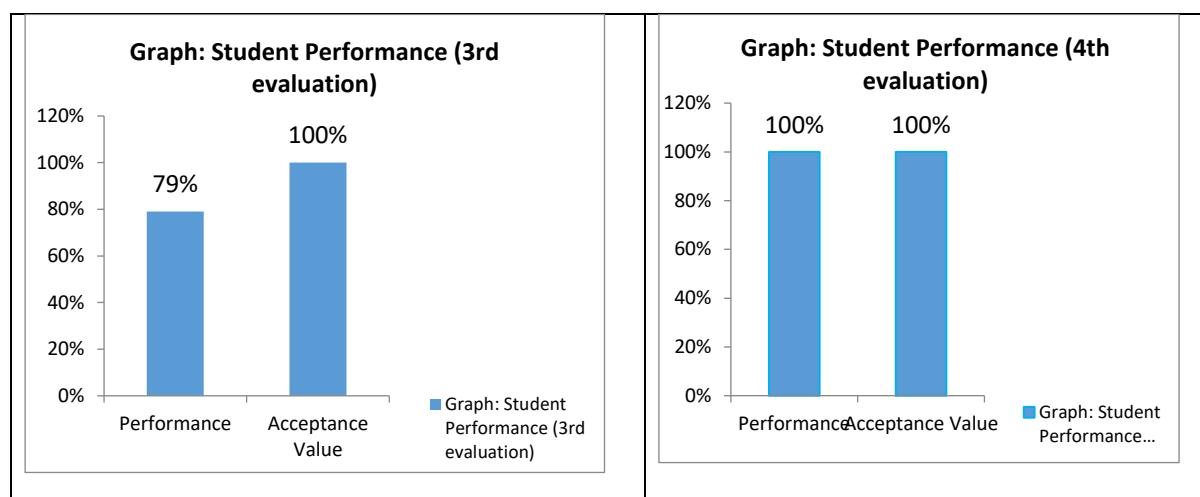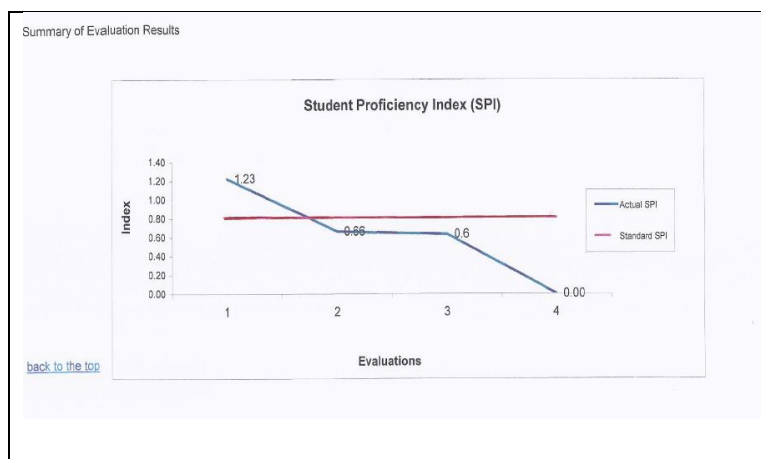
Source: Author's example of the student's performance outcome per evaluation

REPRET presents a detailed report on the student's evaluation performance in terms of strengths and weaknesses. It suggests areas for improving the student's research work. This is supplemented by the graphical presentation (as shown in Figure 3) of the student's performance from the individual research sessions. The graphical presentation compares the student's performance from the expected acceptance norm. For instance, the bar graph in (i) shows the student's overall performance in the first research proposal evaluation as 27 per cent. It compares the evaluation outcome with the acceptable score value of 100 per cent. The comparison indicates a gap (of 73 per cent) in the student's research proposal thus providing opportunity for improvement by the student. Similarly, the performance score of 63 per cent in the second proposal evaluation shows an improvement (when the first evaluation is compared with the second). However, it is below the acceptable score of 100 per cent. Consequently, the forth evaluation outcome in (iv) shows that the student has progressively improved on all sections of the research proposal and meet the acceptable standard of 100 per cent.

Consequently, an evaluation using the innovative process improves the students' skills from the very beginning of their studies (Kairisto-Mertanen, Kanerva-Lehto & Penttila, 2009). Thus, innovation in research contributes to the development of new generation of research professionals who produce, adopt and utilise knowledge, thus making innovative thinking possible and creating added value (Kairisto-Mertanen et al, 2011). Hence, REPRET is the tool that makes innovative process in research possible. It present the Student's Proficiency Index (SPI) in each evaluation. The following Figure 4 presents the example of SPI per evaluation session.

 Figure 4: examples of the SPI per evaluation session

Source: Author's example of the SPI per evaluation

The line graph in Figure 4 presents an example of SPIs. Indexes, in this case, are compared against a benchmark value of 0.80 (indicated with a horizontal straight line graph). As the student improves the quality of the research proposal within an expected time frame (from 1 to 4 evaluation sessions), the graphical SPI trend must show a relative decrease (as shown in Figure 4). Thus, the SPI below a benchmark value of 0.80 represent improvements. The SPI at zero (as in evaluation 4 in Figure 4) is the most acceptable achievement. It should then be accepted that innovation in research proposal development improves the skills and competency needed by the student. The evaluation method used in REPRET facilitates intuitive learning during the research evaluation process and makes the transmitting of knowledge by emerging supervisor (or promoter) possible.

DISCUSSION

Technology is used in manufacturing, business, and research mainly to increase labour productivity (Jarvi, 2012). As integrating technology into education is in many ways like integrating it into any business, it makes sense to evaluate technological applications by changes in learning productivity and quality. William Massy and Robert Zemsky wrote in their paper, "Using Information Technology to Enhance Academic Productivity," that technology should be used to boost academic productivity (Massy & Zemsky, 1995). Hence, PREPRET provides a structured approach of research proposal development and is an evaluation based on facts that enable the student to improve the quality of research within an agreed timeframe.

According to Camins (2015), the pillars and building blocks of 21st century learning include tools, programmes, services and policies such as web-enabled information storage and retrieval systems, digital resources, games, and simulations, eAdvising and eTutoring, all of which are exclusively technological innovations (Serdyukov, 2017), intended to integrate customised learning experiences, assessment-based learning outcomes, wikis, blogs, social networking, and mobile learning. The foundation of all this work is built on resources, infrastructure, quality standards, best practices and innovation (Mercurio, 2016). Thus, the emphasis on tools seems to be an effect of materialistic culture that covets tangible, material assets or results (Jarvi, 2012).

CONCLUSION

Educational institutions are expected to provide an optimal academic environment as well as materials and conditions for achieving excellence of the learning outcomes for every student (Wong, 2017). Thus, innovation in learning can be categorised as either evolutionary or revolutionary (Osolind, 2012), sustaining or disruptive (Yu & Hang, 2010). Evolutionary innovations lead to incremental improvements, but require continuity; revolutionary innovations bring about a complete change, totally overhauling and/or replacing the old with the new, often in a short period of time. Thus, REPRET represents the revolution innovative practice in education. It is a structured approach that assists emerging research supervisors (or promoters) to evaluate students' research proposals efficiently.

FUTURE STUDY

During the course of this study, the long-term survival of REPRET as an intervention for emerging supervisors (or promoters) in the management sciences were not assessed. This includes the influence of students performance outcomes, the REPRET reports for students, as well as SPI in motivating students to complete their research proposals within the planned times. It is recommended that an in-depth longitudinal study is conducted to assess the impact of REPRET through both quantitative and qualitative designs.

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