Review

A Systematic Review of Service innovation in Education: What do we know about?

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Abstract

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Despite grown literature related to service innovation, systematic review focused on service innovation and its impact on performance of educational institutions remained scarce. This paper systematically reviews literature concentrated on service innovation in education. It takes a closer look on different factors that influence innovation in education and ultimately effect performance of academic institutes. Rely upon specific inclusion and exclusion criteria, fourteen research studies including two case studies are systematically reviewed in detail to theoretically address research questions. Systematic review is restricted to the literature published in time period of 2014-2020. this study does not claim to be exhaustive, and directed the attention of researchers toward some future avenues of research that require further scrutiny.

Keywords: Educational institutes, Higher education, Innovation, Service innovation, Technology

INTRODUCTION

Innovation in education is an argumentative substance, education is sometimes considered as conventional social system and field of public policy. It is sometimes considered a sector that is more resilient to change, while simultaneously it is facing problem of efficiency and productivity. Innovation could help to improve quality of education as well as provide "bang for the buck" during the time of budget crises and flying demand. It has found that education is more innovative in some aspects than other sectors, because innovation practices are implemented across the world particularly in teaching methods (OCED, 2016).

Education facing the problem of productivity and efficiency, by efficiency in education means creation of balance among invested resources and output in terms of students' performance and equity. Problem of productivity and efficiency in education is more conspicuous when it is compared with other public sectors, which attained high level of productivity is last few decades (OCED, 2016). In past few decades education has absorbed more

resources. Even in OCED schools, average expenditures of individual student have been increased by 17% from 2005 to 2013 (OCED, 2016).

Innovation has become more indispensable factor in creating competitiveness in global economy, innovation is able to blow new breath in sluggish and stagnant markets. It works as basic mechanism to help organizations in learning new trends and adapting (Damanpour and Gopalakrishnan, 1998; Hargadon and Sutton, 2000). theorists and policy practitioners dominantly focused on business sector innovation (Lekhi, 2007). Businesses needs to innovate in order to compete in industry by offer new products or services, upgrade processes, improvement of organizational structure and entry into new markets (OECD, 2016). in recent decades, focus of previous 'innovation imperative' has been shifted from private/ business economy towards the public organizations. However public services such as education did not offer competitive incentives to innovate as other businesses do offer (Lekhi, 2007). According to

Eddie Blass & Peter Hayward (2014) history and legacy of higher education institutes make them resilient to change. Notions about academic identities, academic freedom and nature of research have been allowed academicians to developed a privileged view about process of graduation and professed production of wisdom and truth (Blass and Hayward, 2015).

Roffeei et al. (2016) conducted a systematic review study about innovation, innovation-related behavior, innovativeness and innovation culture mainly in marketing and management fields. It specifically attempted to examine the concepts related to organizational, corporate and innovation culture of higher education institutions. Cultural components play momentous role in driving innovative practices that are not quite visible but embedded in practices of people within the organization, while individual student's interaction within educational institute can vary, students' trends and patterns of behaviors can emerge in different ways that how students from diverse institutes behave in certain ways. So,diversity of behaviors created the need of innovative culture to shape students' behaviors in similar manner (Roffeei et al., 2015).

Ability to monitor services innovation practices and its results is a base step to properly manage service innovation process. Susanne Dursta et al., (2014) conduct empirical study to measure service innovation at firm-level. Published studies in academic journals from 2006-2014 was reviewed as previous research has been extensively covered by Adams, Bessant and Phelps (2006). Despite of abundant literature in services innovation, empirical studies to measure impact of innovation particularly at firm-level were still scarce. Services are intangible, knowledge-based products so concept of innovation is different in services from traditional product-based view of innovation. Because of heterogeneity, perishability and tailored customer interaction traditional product-based innovation measurements are not appropriate for services business. Very few firms rely on traditional R&D practices for services innovation. Adoption of service-based innovation strategy requires different mechanism to measure effect of innovation practices on performance. Despite of extensive literature available about innovation and services a scarcity observed in innovation measurement techniques. Systematic review published between2006-2014 covered this research gap (Dursta et al., 2015).

Rare research studies have been conducted in the discipline of services innovation. Roffeei et al., (2016) study about innovation-culture as a mechanism to understand university culture, environment and proposed behaviors of members in a specific environment. A framework consists of four dimensions (internal &external environment, university culture and students' innovative behavior) has also been proposed. Susanne Dursta et al., (2014) study focus to measure the services innovation and its impact on firm-level performance.

Diverse to this background, purpose of this research is to review and identify extent literature discussing the factors that contribute service innovation and influence educational institutions performance. However, this study is interested in the body of literature of service innovation in educational institutes. The following research questions are articulated:
(1) what factors influence service innovation in education?
(2) What are the impacts of service innovation on educational institutes' performance?

METHODOLOGY

This study used systematic review process to examine the literature on innovation in education. Specific questions were developed after systematic review of literature and pertinent methods used to select the studies those have to report in systematic review-based study (Brophy et al., 2008, 11). Due to abundance of available literature, fragmentation of studies and limited time availability, it's quite difficult to review and interpret all the published material (Neale 2009, 52). This study used systematic review method to analyzed and evaluated the most relevant studies to critically assess findings and include most relevant studies in the review process of study in counter (Callaghan and Waldock, 2006).

Basically, the essence of systematical review research method was to conduct the content analysis of the available set of secondary data. Content analysis is a process of textual analysis typically used to classify, compare and evaluate existing and available data sets (Roffeei et al., 2015). As suggested by Jesson, Matheson, and Lacey (2011) while conducting a systematic review-based research, study have done with six comprehensive steps sequentially; 1) mapping the field by scoping review, 2) searching your mapped filed comprehensively, 3) assessing and ensuring quality, 4) extraction of most suitable data, 5) synthesis data, 6) the final step of write-up (Dursta et al., 2015). Firstly, study focused on the development of research questions, key words and criteria of relevancy or irrelevancy to include or exclude studies in this systematic review.

Nine research articles were included in this review study. Abstracts as well as methodology, findings, conclusions and contributions were reviewed to summarize in this systematic review. Inclusion of articles with some specific key words in abstract helps to screen out data in more systematic manner (Roffeei et al., 2015; Drusta et al., 2015). Studies those include key words "innovation, service innovation, academic institutes, higher education, technology" are included in this study. Specified criteria were used for inclusion and exclusion of studies from 2014-2020 in this study. Moreover, conference proceedings of the same duration also in

Table 1. An overview of selected research studies involved in the literature

Author Name	Year	Research aim/objectives	Methodology	Findings	Journal name
Eddie Blass and Peter Hayward	2014	Objective of this research paper was to address the questions that what value is added in the society by universities/academic sector beyond 2025? And what practices universities need to adopt regarding innovation to remain relevant beyond 2025?	To conduct research in future is possible as an abstract research target. Mixture of methods need to be adopted. However, taking a collaborative process from "an Australian Business Deans Grant, a HEFCE funded project and a rework of a University of Melbourne on future of academia of Australia" as base, this research study combined the drivers identified in those studies to establish scenarios about the future of academic sector in perspective of knowledge production, research and innovation. Literature was selected based on academic databases, government websites of relevant department and various journals used the terms 'future', higher education' and universities.	Elements of each scenario clearly indicate that universities need to change their innovative practices if they want to survive beyond 2025. Academic sector institutes need to start changing their practices in order to be more adaptive for robust future and shape their practices for their own longevity. In the current time period, this sector focus on teacher management, research and functions of university bureaucracy so focus on innovation has lost. Academic sector needs to shift focus from managing operations towards attaining outcomes and consequences, this shift of focus will automatically lead institutes to be more innovative in future.	European Journal Futures Research.
Mohammad Mozammel Haque, Abd. Rahman Ahlan and Mohamed Jalaldeen Mohamed Razi	2015	Purpose of this research is twofold; 1) to discover best knowledge sharing conceptual framework based on existing research models of higher education institutes, and 2) to propose a frame work that help in understanding better nature of knowledge sharing in higher education institutions.	This research study adopted argumentative/subjective research i.e. idea generation in IS (information sharing). Proposed research model has based on IS theories from extensive literature about knowledge sharing.	Findings revealed that technological, individual and organizational knowledge sharing frame work with IS theories assist to explain knowledge sharing frame work in developing countries. Proposed, diverse frame work of this study, in comparison to previous researches about knowledge sharing is able to boost institutional innovation.	
A. Srinivas Rao, P. M. Suresh Kumar and P. S. Aithal	2015	Purpose of this study was to review and examine best innovation practices implemented at SIMS (Srinivas institute of management studies). Study aimed to identify and extract practices that academic institutions need to adopt for their survival in era of emerging competition.	Real scenario of SIMS was observed and examined to address the aim of study.	Study explored innovation practices implemented at SIMS covering curricular aspects, teaching-learning evaluation, research, infrastructure, student support programs and governance & leadership management. SIMS has transformed philosophy and approaches of teaching and learning process. Innovation practices have no end. It continually contributed to add value and quality so there was a dare need to constantly adopt new innovative practices.	Munich Personal RePEc Archive

Table 1. Continue

Siti Hajar Mohd Roffeei, Yusniza Kamarulzaman and Farrah Dina Yusop	2016	Aim of this study was to propose a framework to demonstrate the impact of innovation culture on students' innovative behaviors. It also aimed to provide deepened knowledge about the impact of internal and external environment on innovation culture and innovation behavior of students.	Content analysis is used to categorized and compare sets of data. Current cultural perspectives were observed to evaluate students' innovative behavior and to propose a framework to best define innovation culture. Review study covered empirical research and conceptualizations published in the time zone of 1980-2015.	Study findings revealed a proposed framework consisting on four dimensions (internal environment, external environment, innovation culture and innovative behavior) that help institutions to develop innovative culture to cultivate students' innovative behaviors. That eventually contributed in the production of more innovative graduates beneficial for achieving global recognition.	Procedia-business and social sciences.
Kainat Waseem, Dr. Hasnain Alam Kazmi and Ovais Hussain Qureshi	2016	Objective of this study was to inspect and shed light over the current educational system of Pakistan. It focused to make a comparison among traditional education system of Pakistan and international modern education system with 3D printing technology.	Qualitative research method was used to explore the innovativeness of 3D technology, 7 Semi-structured interviews were conducted to solicit responses of teachers, students and 3D printing service providers. Data was analyzed using content analysis method and precise texts were applied in conversing the emergent theme.	Findings of study revealed that teachers as well as students are significantly motivated for adoption of 3D printing and prototyping technology as it will be a revolution in near future of educational system. This technology should be adopted at Primary and basic education level to produce better understanding and innovative minds. It is observed as imperative factor in state development.	Journal of education and practice
Fuat Fındıkoğlu Dilek İlhan	2016	Aim of this paper is to provide detailed insights about the care needed to handle innovation in education with the perspective to enhance competence, skills, ability and potential among learners so that they be able to deal with complexities of today and tomorrow.	This research evaluated the prior studies and literature related to innovation as a prerequisite for innovative learning environments and amended strategies for efficacious adaption of technology in the educational context, consequently generating innovation-oriented learning environments.	Educational sector is major source to change the people and societies and more broadly they can transform the innermost dynamics of their whole country. Integration of information and communication technology (ICT) is a most facilitating factor in the content development of curriculum. However, distinction between innovation and embeddedness of technology must be consider as both hold distinct notion. Technological embeddedness is a sub-part of innovation related practices. Technology bring upgradations in equipment sans materials whereas innovation is broadly more suitable for amendments and upgradations in curriculum. Conclusively, technology is facilitator in concept delivery and innovation is uniqueness and novelty in learning base.	Universal Journal of Educational Research

Table 1. Continue

Suparjo	20 17	This study focused to investigate the impact of professional competence on commitment to face changes, and its role in developing learning organizations, service innovation on and organizational performance. It focused to identify effect of salary satisfaction, career satisfaction and work satisfaction on pace to face changes.	Quantitative method is used in the study. Questionnaires were floated in private universities to conduct survey. Sample population consist on 2216 lectures from 20 universities.	study disclosed that commitment to face changes has a positive effect on the performance of lecturers, directly or indirectly. Findings positively reinforce results of previous researches about impact of service innovation on lecturers' performance	European Research Studies Journal
Sandra Hasanefendic, Julie M. Birkholz, Hugo Horta and Peter van der Sijde	20 17	Study aimed to address academics and their characteristics who innovate in higher education institutions	Qualitative case study was conducted based on comparatively small number of cases to analyze similarities and differences. Criteria for selecting interviewees were; individuals who were reported to introduced descriptive & transformative innovations in curriculum practices oh higher educational institutes and individuals who worked to remove internal constraints for innovative practices. Case study was implemented on six individuals.	Findings revealed six common features-inner eager to change institutional practices, interest in adopting changes, practical experience, multiple-embeddedness, empowerment to take actions, and the tactical use of social links - of academic individuals who play significant role in transformative, disruptive and pedagogic innovation practices.	European journal of higher education
Peter Serdyukov	20 17	This paper aimed at investigation of analytical review about innovation in education discipline particularly in the context of USA. Paper delineated details about classifications of innovation and shed light on the obstacles in implementation of innovative practices in educational institutions. Furthermore, this paper provides insights to enhance innovation-based transformations and upgradations in the educational institutions.	This research paper entailed the process of literature review and researchers conducted by previous authors to define theoretical base and draw conclusions from it.	Finding of this study revealed that there is an intensive need to design and implement affective innovation scale to yield excellent quality learning outcomes across the educational system. At its core, educational innovation needs to strive for innovative teaching methods, unique theoretical base and implementation of innovative practices. Furthermore, educational innovation demands to be focused towards continuous evolvement of the learners, their parents, community and societal improvements. Thus, to implement innovation in educational context, a continuous upgradation of whole culture is required.	Journal of research in innovative teaching and learning.

Table 1. Continue

Viv Ellis Mariana Souto-Manning Keith Turvey	20 18	This research study aimed to reinvestigate the meaning of innovation in teaching field and to offer insights about a clear distinction economic and technological innovations. This paper diverted major attention towards the dilemma of teacher-learning innovation.	This study was review study in nature. Study considered six papers related to the under context.	This study investigated and found Two prerequisites of innovation supported by influences of social justice and equity. Findings revealed the discussion about teacher-learning debt, education debt, civilization of teaching, person-centered learning practices of becoming teachers.	Journal of Education for Teaching International research and pedagogy
HALYNA MYKHAILYSH YN OKSANA KONDUR LESIA SERMAN	20 18	This paper aimed to offer insights regarding distinction between two terms: educational innovation and innovation in education.	This study adopted scientific reviewed methodology and draw inferences to obtain conclusions.	Paper revealed that 'educational innovation' is smaller part of broader term 'innovation in education'. Thus, innovation in education entailed educational insights, infrastructural aspects, technological upgradations, economic, social, legal, organizational, administrative and other interrelated innovative practices. Whereas, educational innovation encompasses the uniqueness and upgradation of learning/ educational activities, process and methods that substantially distinct from already existing practices, which subsequently focus on enhance efficiency in competitive environment.	Journal of Vasyl Stefany k Precarpathi an National University
M. Jakovljevic	20 18	The foremost aim of study was to propose a model for innovation/invention that can drive innovative endeavors in academics. So major purpose of study was to create a theoretical framework served as a base to propose model, originate model and critically evaluate it regarding changes in academic practices over applied creativity. Study focused to answer the questions; what components facilitate innovation/invention in higher education and how those factors effect innovation in academic model?	Study was divided in two phases; in first phase essential criteria were developed, considering south African universities' innovation practices (Lubango and Pouris 2009; Kaplan 2009; Sibanda 2007). Based on innovation literature criteria, innovation/invention model facilitating innovation in higher education was developed.	Analysis of multiple innovation components led to derivation of model that facilitate academic innovation practices. Combination of practical, theoretical and reflective experiences lead to the development of ORED (observation, revelation, exploration, design) model including 6 cycles and 30 components. Individual perspective of innovation was missing in literature. Findings indicated that universities in developing countries need to shift their attention towards innovation orientation.	South African Journal of Higher Education

Table 1. Continue

Nguyen Ngoc-Tan and Ales Gregar	20 18	Paper aimed to discover influence of Knowledge management on innovations in an academic environment.	Survey was conducted to collect responses from participants and Structural Equation Modeling (SEM) was applied to test relationship among hypothesis	Results disclosed that knowledge management (KM) comprehensively influence technical innovation in academic institutes however, all components of knowledge management do not have direct impact on administrative innovation	Interdisciplinary Approach to Economics and Sociology
Adekunle Oke Fatima Araujo Pereira Fernandes	20 20	Purpose of this study was to related the unified theory of acceptance and use of technology (UTAUT) with educational innovation with an aim to observe and investigate the readiness of educational sector for the adoption and implementation of fourth industrial revolution (4IR)	In-person semi-structured interviews were conducted to gather responses from 33 persons. Responses were obtained from key stakeholders of educational industry.	Findings of this research study revealed that despite of availability of potential opportunities, the readiness to adopt 4IR is still unprepared, specifically in African context. Furthermore, findings depicted mutual synergetic interdependencies between technological innovations and educational sector. Adoption of 4IR expected to facilitate learning environment but the barrios and facilitating factors need to be scrutinized more.	Journal of Open Innovation: Technology, Market and complexity.

inclusion criteria. However, government/ Federal or private reports, grey literature, non-academic data, non-published material or data in other than English language excluded from this review study. Analyzed contents of studies are presented in tabular form according to the aspects and aim of research.

FINDINGS

This systematic review examined fourteen research studies of service innovation in education findings of which was presented in table (1.1). Studies were published in 2014-2020those fulfill the objective of study included. Glimpse of table summery described pretty fair trend of innovation studies in educational institutions.

Studies included in this systematic review used diverse range of methods such as adopt scenario-based technique draw on collaboration to assess future of educational sector regarding the elements of knowledge production, research and innovation. Developed scenarios were differ from other as they were 'sectorial scenarios' rather than field scenarios. Scenarios presented extreme situation that could arise if certain factors dominate till 2025(Eddie Blass and Peter Hayward, 2014), some study based on argumentative research methods (Mohammad Mozammel Haque, Abd. Rahman Ahlan and Mohamed Jalaldeen Mohamed Razi, 2015), scenario-based case study methods was practiced studies(A. Srinivas Rao, P. M. Suresh Kumar and P. S.

Aithal, 2015; Sandra Hasanefendic, Julie M. Birkholz, Hugo Horta and Peter van der Sijde, 2017), content analysis technique was used analysis of studies (Siti Hajar Mohd Roffeei, Yusniza Kamarulzaman and Farrah Dina Yusop, 2016), quantitative research methods (Suparjo, 2017) and qualitative research techniques (Kainat Waseem et. al, 2016; Sandra Hasanefendic et. al, 2017).

Innovation in education, findings of this review study demonstrated that educational institutions need to shift focus from managing operations towards managing innovation if they want to survive and remain competitive (Eddie Blass and Peter Hayward, 2014). Combination of organizational, individual and technological frameworks of knowledge sharing models boost innovation in education (Mohammad Mozammel et. al., 2015). Internal, external environment, innovative behaviors of students and institutes' culture regarding innovation help to evolve innovation practices in higher learning institutes (Siti Hajar Mohd Roffeei et. al., 2016). Academicians (both teachers and students) were observed quite enthusiastic about inclusion of 3D printing technology in learning activities and considered it evolutionary step in academic innovation (Kainat Waseem et. al., 2016). Lecturers' commitment to face change positively contributed in organizational performance and innovation practices (Suparjo, 2017). Innovation in education is a multi-step process to convert ideas into new/improved processes, product or services to remain competitive and differentiated. Innovation in education address two streams of literature; first, environment exert pressure on

academicians to adopt innovative practices and policies, whereas second stream of literature defined that internal structure, identity and culture which shape innovative practices in higher educational institutions (Sandra Hasanefendic et. al., 2017).

Detailed evaluation of fourteen most recent-published from 2014-2020 research studies of innovation in education has nurtured findings of this study and provide theoretical answers of research questions. Assessment of involved research studies revealed that different factors contributed in innovation of education and they have different impact on performance of educational institutions.

Innovation in education; what works and what to do about it

Education sector is in dare need to develop an innovation scale to promote effective learning outcomes in the students throughout the system. It can be fostered by Intensified integration of efficacious learning models and creative conditions at educational institutions which not only accelerate innovation but also offer sustenance to educational entrepreneurs (Tait and Faulkner, 2016).

Distinctive and systematic transformations are required to target vital educational aspects. Radical improvements in the efficiency and quality of teaching & learning theory and practice required primary focus. However, role of society, community, parents and culture also presumed to be matter of serious attention. Further, Time and cost efficiency, value-adding instructional tactics, policies and techniques to fulfill mission of primary education become matter of consideration. Along with technology orientation, innovation adoption behavior from human beings is also required to implement innovative inventions at learning environment (Serdyukov, 2017).

Education market is one of the most vital and viable market for innovation with all of its potentials. Thus, it has been substantiated that implementation of innovative practices is most substantial element to bring innovation in a country. Innovative practices implemented by higher educational institutions are originated ad market leaders in education industry (Mykhailyshyn et al., 2018).

Innovation is interchangeably used with the term technology adoption. Innovation in sciences and innovative research in sciences discipline is a topic of utmost interest now days. Society has been emerged as knowledge society so knowledge creation and management are predisposition. This transformation lead towards the notion of entrepreneurial society which build upon the innovative ideas of individuals to meet the challenges of innovative economy. Similarly, societal transformations have been observed in the educational context. Technology adoption is a part of in-novative practices in educational context to increase the

effectiveness of curriculum structure, teaching methods and other aiding material. Precisely concluded that technology provides support to deliver innovative contents to the learners (Fındıkoğlu and İlhan, 2016). The notion of teacher education debt has been founded major factor to contribute in practices of innovative techniques (Ellis et al., 2018).

Teaching and learning innovations; A perspective of 4th Industrial revolution (4IR) integration

Controversial opinions were observed regarding the adoption of 4IR in educational sector thus lack of a straightforward and clear-cut notion. No doubt its potential benefits have been observed not only in teaching and learning but also in employment context. But, lack of preparedness from major stakeholders in the transformation of education in to more digital-based activity disclosed that the industry is still not ready to capture the potential. There is crucial need to uplift the barriers for the smooth adoption and implementation of 4IR in educational sector (Oke & Fatima Araujo Pereira Fernandes, 2020).

Innovation and higher education sector; a future perspective

Eddie Blass and Peter Hayward (2014) explore the future of academic sector in 2025,on the bases of some authenticated researches and journals about future of innovation in education, five scenarios were developed; MOOC the public academic champions, leading knowledge formation, creation of responsive knowledge, collaborative partnership for sustainability and innovative thinking for higher project-based clusters. Universities need to focus on 'social innovation' management. By 2025 academic institutes need to offer MOOC (massive open online courses) at graduate level. Survival and competitiveness depend upon ability to successfully manage MOOC. In terms of innovation, buzz factor and eye-catching elements considered more effective specially in process and paradigm innovation. Although educational sector will be more shrink in 2025 but requirement of knowledge transfer was viewed to be more indispensable. To maintain interaction among university and outer environment highly qualified professionals required with full understanding about what they are offering. Survival and competitiveness in future require sharing of knowledge as making knowledge scarce and inaccessible lower value and benefit. Furthermore, academic institutions need to add practice, industry-based knowledge in future by including professionals in their delivery team (Blass & Hayward, 2014).

Knowledge management, knowledge sharing and innovation capabilities in HEIs

Knowledge management based on integration of three perspectives; information base, technology base and culture base (Alrawi 2008). Components of Knowledge management (knowledge acquisition, knowledge dissemination and knowledge utilization) has positive influence on innovation especially in academic context. Knowledge management comprehensively affected technical innovation in education whereas, not all, but some components directly influence administrative innovation. Empirical findings revealed knowledge management significantly and positively influence technical innovation in public academic sector of Vietnam (Ngoc-Tan and Gregar, 2018).

(Mohammad Mozammel et. al., 2015) proposed a model with reference of seven other knowledge sharing research frameworks for higher education institutions and explored antecedents that significantly affect innovation competencies of universities were; perceived self-efficacy for learning and training, professed leadership, perceived social networks, ICT tools, organizational rewards and organizational climate. Extensions of theory of reasoned action, theory of planned behavior, integrated with social capital theory revealed that behavioral attitudes, subjective norms and knowledge sharing motivation positively influence performance and innovation capabilities. Knowledge sharing and innovation has strongly positive interconnections (Emadzade, M.K, Mashayekhi, B. & Abdar, 2012). Excellent knowledge sharing capability positively lead to enhance innovation capability in academic environment (Iqbal et. al., 2011). Effective academic knowledge sharing capabilities enhanced innovation competences of universities (Bulan, S.J. and Sensuse, D.I., 2012). Individual, technological and organizational factors enhanced innovation competences of education institutes (Mozammel , Ahlan, & Mohamed Razi, 2015).

Innovation culture and learning institutes

Routine practices, organizational norms, patterns of behaviors and other components of culture that not so visible but manifested in the ways people perform their activities, contribute to originate innovative culture in organizations. Whereas students' behavior differed in a campus, diversity has also been observed in trends and patterns of behaviors when students from different universities interact in some organization. This diversity demanded to create suitable innovation culture to restructure students' innovative behavior in their institute of origin. A collaborative learning environment lead to enhance students' innovative skills by providing opportunities of becoming more experimental, risk takers and to be interconnected with like-minded people. Siti

Hajar Mohd Roffeei (2016) proposed framework consisted on four dimensions; internal environment, external environment of university, innovative culture and innovative behavior. Positive internal and external environment of university with strong identification of goals, mission and integrated internal communication, well-established infrastructure etc. have significant strong influence in development of innovative culture which in turn lead to create students' innovative behaviors (Mohd Roffeei , Kamarulzaman , & yusop, 2016).

3D printing and prototyping technology in education

Educational system now days adopting DIY (do-it-yourself) approach to explore individuals' innovative capabilities. DIY approach injected 3D technology at primary learning level to develop interest and interaction with technology. 3D printing and prototyping is a globally emerging phenomena and will take years in further growth. High tendency has been observed among teachers and students to adopt 3D printing technology in education system. Academicians were with the view that it would be another great revolution in academics just like computer. Innovative ideas in tangible forms have been widely supported and adopted in academic aspects of Pakistan. 3D technologies need to be infused at primary education level in order to create more innovative minds. Increased awareness about technology has proposed more adoptive trends regarding 3-dimensional printing and prototyping in class room learning. However, lackness to attend coaches and teacher training were challenges to be overcome (Waseem, Kazmi, & Qureshi, 2016).

Professional competence and innovation in education

Research conducted in private universities of central Java revealed that organizations' role to fulfill social and emotional needs of employees increase satisfaction and gave rise to positive work behaviors (Cullen et al., 2014). Fair remuneration system also provoked employees' level of satisfaction (Giannikis and Mihail, 2011). Employees when satisfied with remuneration enthusiastically contribute in every process held in organization including change. Reward satisfaction has positive influence towards commitment to face changes. Along with rewards satisfaction, Work satisfaction and career development also have positive impact on employees' commitment to face changes. Employees' commitment to face change boost organizational learning process and ultimately learning organization has considered more innovative. Eventually service innovation enhanced lecturers' performance and so as overall organizational performance (Suparjo, 2017).

Innovation model in higher education

Although abundant research about the role of innovation in education has carried out, but literature related with individual's frame of innovation of how to empower an individual towards life-long innovation activities was still missing. M. Jakovljevic (2018) overcome this gap and presented innovation model in individual perspective at academics. Awareness of individuals' potential innovative competence, internal and external dynamics help innovation sustainability. Individuals' innovative competences originate from well-being of society, family, educational institutes, and work places (Engeström 2005). ORED (observation, revelation, exploration, design) model formed individuals' innovation bases and presented basic innovative cycles emphasizing that individuals are responsible for self-grooming in innovation perspective. A well-being society, supportive environment and access to resources create inner drive of innovation that push individuals to fruitfully accomplish successive steps of observation, revelation, exploration and design which eventually resulted in innovative practices (M. Jakovljevic, 2018).

CONCLUSION

The aim of this paper was to identify body of knowledge regarding service innovation in education found in peer review of related literature. Nine research papers including two case studies fulfilled selection criteria for this research. Small number of papers selected show that existing body of literature is still ambiguous and fragmented. However, focus has been shifting towards innovation management as, without focusing on innovation survival and maintenance of competitiveness has become more difficult in this contemporary era. Innovative culture, individuals' innovative competences, adoption of 3D technology and comprehensive number of proposed models regarding innovation have positively contributed to enhance innovative practices of academic institutes and lead to improve the performance. Adoption of technology and innovative practices is going to be the base of survival in upcoming decades. This research is not without limitations. A comprehensive coverage of studies regarding service innovation in education could has not been achieved. There might be some more studies addressed service innovation in education but in another language or not published in proper journals. Although it illustrates that topic of service innovation in education is under-addressed and existing literature is ambiguous. But Finally, this study does not claim to be exhaustive, and directed attention of researchers toward some future avenues of research that require further scrutiny.

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