INNOVATION COMPETENCE AMONG STUDENTS INARTS & SCIENCE COLLEGES IN COIMBATORE CITY

Abstract

The dynamic and rapidly evolving business landscape, fueled by technological advancements and shifting market dynamics, necessitates a reevaluation of the skills and competencies required for managers to thrive in the future. This research explores the role of lifelong learning, adaptability, and technological literacy in developing effective management capabilities in the face of these challenges. Lifelong learning enables managers to stay relevant by continuously acquiring new knowledge and skills. Adaptability empowers managers to navigate change and complexity, while technological literacy enables them to leverage emerging technologies strategically. Through a mixed-methods approach involving surveys, interviews, and case studies, this research assesses the current state of skills among managers, explores experiences and perspectives, and identifies best practices. The outcomes provide valuable insights for managers, organizations, and policymakers, informing the development of effective management development programs that prioritize lifelong learning, adaptability, and technological literacy. The findings also address challenges and barriers, ensuring successful implementation and adoption of these skills for agile and future-ready management practices.

Keywords: Learning, Adaptability, Technological Literacy

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I. INTRODUCTION

All sectors of the economy emphasize the importance of innovations. Business firms and organizations are continuously looking for innovative employees. Companies need innovations to create competitiveness and the public sector needs innovations to produce high-quality and cost-efficient services. As a result, there is an urgent need for future professionals who are capable of participating in innovation processes and who can contribute to the creation of innovations. Innovative individuals are the resource of all innovations and higher education represents a critical factor in human capital department.

The role of higher education is not only to educate undergraduates for future work but also to train future employees to perform work tasks, which then generate innovations. Higher educational institutions, regardless of context, are expected to prepare innovative individuals capable of coping with the twenty-first century demands. A renewed EU agenda for higher education institutions (European Commission, 2017) not only highlights the unique role of higher education in contributing to innovation but also demands effective and efficient higher education systems.

Rogers (2003) opined that the economic growth and social progress of any nation depend increasingly on innovation. He defined innovation as an idea, practice, or object which is perceived as new by a unit of adoption and carried out into practice). According to the opinion of OECD (2007), Innovation is "the implementation of a new or significantly improved product (good or service), or process, a new marketing method or a new organizational method" Innovation in students is what builds an organization, a nation, and the world. The concept of innovation involves incremental adaptation and gradual adoption in different contexts. Creative learning and pedagogical tools should be implemented by the education system to bring out the innovative mind-set among the students. These tools will bring new ideologies and start-ups in India.

Portuguese *et al*. emphasised the valuable role played by higher educational institutions in creating synergies between innovation and entrepreneurship. Yordanova *et al*. observed that universities are increasingly oriented towards creating a favourable environment promoting entrepreneurship and innovation. Entrepreneurship Awareness Programmes support the students to develop creativity and innovation and nurture potential entrepreneurs and innovators. The New Education Policy 2020 introduced in India, created an awareness of creativity and innovation among the students. An initiative undertaken by MHRD's Institutions Innovation Council, Entrepreneurial Development Cell and establishment of Incubation centres has facilitated the students to understand the need for creativity and innovation in business.

Review of earlier studies reveal that there are no attempts made to know the role of HEI in promoting innovation among the students and hence in this research paper identifies the perception of students towards impact of learning environment in developing innovation competencies and supporting campus ventures in the select Arts and Science College in Coimbatore city.

1. **Innovation in Education:** Changing job scenario demands the students to have a bucket of skill-sets to perform successfully in their career. HEI have a significant role to play in

honing the Professional and Career skills of students to face the dynamic job environment in the future. Educational practices, especially in higher education, have been criticized for failing to develop these prerequisites of professional expertise. Conventional pedagogical techniques like reading, lecturing and working alone have even shown to be negatively associated with learning the needed competences. It also highlights the importance of evidence-based education that employs innovative teaching pedagogy to engage and make the students perform better.

2. Development of Creativity and Innovation in Higher Education:

Amabile (1998) stated that Creativity and innovation will be nurtured when individuals feel free from stress, safety and positivity and identified nine qualities that promote creativity They are –

- Freedom in deciding what to do and how to accomplish the task.
- Proper project management, which provides a good role model with excellent communication skills, protects the project team from outside distractions and interference.
- Sufficient resources with access to necessary resources, including facilities, equipment information, and people.
- Encouragement and being enthusiasm for the new ideas and creating an atmosphere free of threatening evaluation.
- An environment where innovation is prized and failure is not fatal.
- Recognition and showing a general sense that creative work will receive appropriate feedback.
- It provides sufficient time to think creatively about the problem to explore different perspectives rather than impose an already determined approach.
- A sense of challenge arising from the intriguing nature of the problem itself.
- The last quality of the environment that influences creativity and innovation is pressure and urgency, which is internally generated from the competition with an outside organization.

This study intends to analyse how learning environment impacts innovative competencies and how far it supports students in initiating campus ventures.

II. AIM OF THE STUDY

It is to study the innovation competence among students and study whether learning environment build students' innovation competencies.

Objectives identified based on the research reviews of the study are:

- To examine the students' extent and level of their knowledge on innovation.
- To understand student's perception towards the sources of innovative thinking.
- To analyse students' opinion if learning environment supports in enhancing the innovative skill among students.

- To identify the factors and skills that influences the innovative competence of students.
- To study the perception of students towards the impact of institutional initiatives in establishing campus start-ups.

III. SCOPE OF THE STUDY

- Students will be able to understand their level of Innovation competence and accordingly plan to groom their innovative skills.
- Educators can plan suitable training programs to enhance the creative and innovative skills of their students.
- Academic Fraternity will be able to analyse their students' innovation competencies and decide whether they should take measures to improve them.
- Policy makers in higher education can design suitable strategies to promote innovative attitude and competencies among student community to build an innovative ecosystem in higher educational Institutions encouraging students to initiate campus ventures.

IV. REVIEW OF LITERATURE

Villa and Poblete (2007) defines competence as good performance in diverse, authentic contexts based on the integration and activation of knowledge, standards, techniques, procedures, abilities and skills, attitudes and value. Scholarly research points that the characteristics and behaviour of people in the workplace are at the core of organizational innovation. (Patterson, 2009).

Competence is defined as an individual quality, which causally explains efficiency defined by certain criteria, or success in duties and tasks in work situations. (Ruohotie, 2003) defines Competence can consist of motivations, characteristics, self-concepts, attitudes, values, knowledge or cognitive and practical skills – any individual qualities, which can be reliably measured and assessed. Innovation competence can be defined as those capabilities, which are needed for a successful innovation (Forsman, 2009).

V. INNOVATION SKILLS

It is increasingly acknowledged that future innovators and entrepreneurs will require a large range of skills to be able to meet the demands of the changing economy (OECD, 2010). A larger group of students with broad range of innovative skills will be a great boon to our nation's start-up community. In addition to innovation and strong subject-based know-how, skills such as critical thinking, design thinking, creativity, problem solving and ability to look at things from broad perspectives will be needed in the students of tomorrow. They will need to work in teams, communicate their messages effectively and adapt to changing circumstances and learn to interact with their environment instead of working in isolation. Transferable skills are crucial for today's students to be prepared for tomorrow's workplace (Barrett and Moore, 2011).

Creative thinking skills are defined as creative competences and cognitive skills. Creativity is a key innovation competency factor in most studies. According to Cerinšek and Dolinšek (2009), creativity is the ability to generate new ideas independent of their possible practicability and future value. Students are expected to be prepared to collaborate in solving future problems and producing innovations in areas that presently do not exist (Sawyer, 2014).Openness to experiences and curiosity are defined as the willingness to confront new situations and the flexibility to experience them (Celik, 2013). Proactiveness is the ability to develop new ideas and take initiative (Cerinšek& Dolinšek, 2009). Coping with chaos and uncertainty reflects an ability to deal with unexpected situations, the flexibility to deal with plans and deadlines and the ability to improvise (Chatenier*et al.*, 2010).

Problem solving is defined as a generic skill that is key to innovation and synonymous with the creative process (Edwards-Schachter *et al.*, 2015). Cognitive skills are also considered crucial for innovation. According to Treffinger, Young, Selby and Shepardson (2002), cognitive skills refer to convergent or critical thinking ability.Social skills are the core competency in innovation development. Social skills are necessary for interaction and communication with others (Riggio, 1986). Social skills are divided into three sub-categories: collaboration, networking and communication skills.

Collaboration skills were defined as the ability to work productively with others (or in teams (Jack *et al.*, 2014). Teamwork skills allow otherwise dispersed local knowledge to be combined, which allows innovative capabilities to be improved (Wang and Shuai, 2013). Networking skills refer to the ability to develop, maintain and use networks effectively to forge beneficial alliances and coalitions that are critical to innovation (Avvisati*et al.*, 2013).

Social astuteness is defined as a person's ability to understand social situations and interpersonal interactions, and to remain sensitive to the motivations and responsibilities of different parties. It involves expressing empathy (Chatenier*et al.*, 2010). Brokering skills are defined as information exchange skills in which participating people link information and knowledge from various internal and external sources, which leads to new opportunities (Bjornali&Støren, 2012). This article is aimed at understanding the innovative competence of students and helps to understand how the learning environment in the higher educational environment has supported the students to develop this competency. It also attempts to understand the student's perception of how innovative competency has supported them to initiate campus start-ups within the educational institution.

This leads us to pose the following research questions:

RQ1: How do students perceive their own innovation competencies?
RQ2: What innovation competencies are best achieved by students?
RQ3: What is the level of satisfaction with regard to Institutional initiatives and services in supporting the initiation of campus start-up ventures?

VI. RESEARCH METHODOLOGY

Descriptive research design is used in this study. **Simple random sampling** technique is used for the present study to identify the sample respondents. The s**ample size of the present study is** 250 students from Arts and Science College in Coimbatore district.

Data is collected through primary and secondary sources. In primary data, it is done through Google form that includes data about their demographic profile and study related parameters to judge their perception towards innovation competence, its triggering factors, skills required and different components of innovation. Secondary data was collected to support this study from various websites and journals. The tools used for data collection is Questionnaire through Google forms to test Innovation competence of students and simple percentage analysis is used for analysing the data in the present study.

VII. RESULTS AND DISCUSSIONS

Table 1: Profile of the respondents

Variables	Category	Respondents	Percentage Analysis (%)
Gender	Male	178	71.2
	Female	72	28.8
Age	Below 20 years	62	24.8
	20-29 years	188	75.2
	Above 30 years	NIL	NIL
Educational Level of the respondents	Under graduate	174	69.6
	Post graduate	72	28.8
	Ph.D.,	4	1.6

From the above table we can understand that 28.8% of the respondents are female and 71.2% of them are male. Female students display more risk aversion than their male counterparts, yet they exhibit problem-solving skills, decision-making, creativity, communication, and networking which are conducive to innovation but of low stature than the male students. 24.8% are below 20 years while 75.2% of them are from 20-29 years.69.6% of the respondents are Undergraduates, 28.8% of the respondents are Postgraduates and 1.6% of our respondents are Ph.D. research scholars.

Table 2: Student's perception towards Innovation

S.No.	Meaning of the term – Innovation	No. of Respondents	Percentage Analysis (%)
1	Creating new idea	57	22.8
2	Implementing new idea	46	18.4
3	Doing Something different	24	9.6
4	All of the above	123	49.2

From the above table, we can understand that out of 250 responses, 49.2% of respondents reported innovation means creating new idea, implementing new idea, doing something different, 22.8% of the respondents reported innovation means creating new idea and 18.4% of the respondents reported innovation means implementing new idea and 9.6% of the respondents reported innovation means doing something different.

Table 3: Student's opinion towards sourcing opportunities for Innovation

Sl.No.	Category	No. of respondents	Percentage Analysis (%)
1	Market analysis from Customers, Competitors and other stakeholders	69	27.6
2	Observation from Pain points of Users by the employees of the business firm	35	14
3	Research& Development Institutions	42	16.8
4	Technological advancements	81	32.4
5	Others like self-driven interest	23	9.2
	Total	250	100

Table 3 reveals that 32.4% of the respondents opined that technological advancements led to innovation, 27.6% of them felt that innovation generates from Market analysis based on the feedback from Customers, customers and other stakeholders, 16.8% of them opined that innovation stemmed from R& D Institutions, 14 % of them believed that innovation cropped out from observing the pain points of Users by the employees of the firm, while others reported that innovation might have been developed out of the self-driven interest of the individuals.

Table 4: Importance of innovation among the students

S.No.	Category	No., of Respondents	Percentage (%)
1	Helps in discovering new opportunity and technology	52	20.8
2	Helps in developing new ideas leading to new products and services	73	29.2
3	Involves different way of looking at problems and solving them with "Out-of-box thinking"	125	50

From the above table we can understand that out of 250 responses, 50% of the respondents reported that Innovation helps in problem-solving using out of box thinking, 29.2% of the respondents that it helps to introduce innovative new ideas and technical developments while 20.8% of the respondents opined that it helps in discovering new opportunities leading to the development of new products and services.

Table 5: Support of learning environment in the college to develop innovative skills

S.No.	Category	No., of Respondents	Percentage (%)
1	Strongly agree that learning environment in colleges facilitate to develop innovations	56	22.4%
2	Agree	79	31.6%
3	Neutral	100	40%
4	Strongly disagree	8	3.2%
5	Disagree	7	2.8%

From the above table we can understand that out of 250 responses, 40% of the respondents neither agree nor disagree that learning environment supports innovation, 31.6% of the respondents agree that learning environment supports innovation while 22.4% of the respondents strongly agree that learning environment in the colleges supports in the development of innovations.

Table 6: Student's perception towards innovation in Education

S. No.	Parameters	Category	No., of Respondents	Percentage (%)
1	Innovation in Education is developed through------.	Seeking knowledge from Listening to experts	56	22.4
		Reading books	30	12
		Observing others in the environment	36	14.4
		All the above	128	**51.2**
		Total	250	100
2	New Innovative learning technique adopted in education	Competency based learning strategies like role play, debates, Management games, Presentations, etc.	25	10
		Flipped classrooms	40	16
		Digital learning	65	26
		Peer learning	16	6.4
		All of the above	104	**41.6**
		Total	250	100
3	Changes needed in Present Educational Sector	The government has to take the baton in their hands	59	23.6
		Eradicate Rote learning from the HEI at all the levels.	110	**44**
		HEI must be encouraged to introduce conceptual learning and design thinking	81	32.4
		Total	250	100

4	**Skill required for innovation**	Curiosity mindset	38	15.2
		Critical and Creative thinking skills	120	48
		Risk taking attitude to do things differently	50	20
		Collaboration with others and pooling new knowledge	17	6.8
		Others like problem solving skills, etc.	25	10
		Total	250	100
5	**Innovations promoted through Institutional initiatives through EDC**	Institution's Innovation cell @PSGCAS	45	18
		Incubation Centres	2	0.8
		E- Cells and Innovation clubs	34	13.6
		Guest Lecture Programmes	46	18.4
		Workshops on Design thinking	25	10
		Conferences	4	1.6
		Training and development	27	10.8
		Ideathons, Hackathons and other business-related competitions and events	67	26.8

From the above table we can understand that 51.2% of the respondents opined that innovation in education is developed through Seeking knowledge from Listening to experts, reading books and observing others in the environment. 48% of the respondents reported that competency-based learning, flipped classrooms, digital learning are the new innovative learning techniques followed in education. 44% of the respondents opined that Rote learning (memorising) must be eradicated from colleges.

48% of the respondents opined that creativity triggers innovation, 20% of them opined risk taking mindset to do things differently triggers innovation, 15.2% of the respondents opined that curiosity triggers innovation, 6.8% of the respondents opined collaboration with others and pooling new knowledge as required for innovation while 10% opined problem solving skills for innovation process.

With response to the students opinion towards Innovations promoted through Institutional initiatives through EDC, 26.8% of them strongly agreed that participating in Ideathons, Hackathons and other business-related competitions and events encouraged them to be creative and innovative in generating new business ideas and opportunities.

Table 7: Perception of students towards the impact of institutional initiatives in establishing campus start-ups

S.No.	Statements	Agree	%	Neutral	%	Disagree	%
1	I am confident that the institutional efforts support in	162	64.8	76	30.4	12	4.8

	building innovation competencies among student community leading to the initiation of start-up firms within the campus.						
2	I strongly believe that mentorship can support the student community towards initiating start-ups within the campus	185	74	61	24.4	4	1.6
3	Institutional infrastructure is very important for developing campus ventures within the institution	197	78.8	51	31.5	2	0.8
4	Innovative mindset and entrepreneurial ecosystem are essential for initiating campus ventures by the student community.	189	75.6	54	21.6	7	2.8

It has been observed that 64.8% of the respondents are confident that institutional efforts support in building innovation competencies among student community leading to the initiation of start-up firms within the campus.

74% of the students strongly believe that mentorship can support the student community towards initiating start-ups within the campus.

78.8% of the students opine that Institutional infrastructure is very important for developing campus ventures within the institution.

75.6% of them respond that Innovative mindset and entrepreneurial ecosystem are essential for initiating campus ventures by the student community.

Table 8: Satisfaction level towards support ecosystem for campus start-up ventures

Facilities and Services Provided	Mean	S.D.	t.	Sig.,
Pre-incubation and Incubation facilities	4.18	0.08	13.132	0.000
Facilitate funding support through IVP	4.10	0.99	9.839	0.000
Legal, administrative, marketing and technical support	3.88	1.15	5.756	0.000
Research labs and infrastructural facilities	3.50	3.50	1.14	2.403
Provide linkages between technical institutes and successful entrepreneurs	3.49	1.17	2.607	0.013
Quality of faculty mentors	3.75	1.08	6.148	0.000
Workshops, seminars, investor pitches, Ideathons, Hackathons and events organised by EDC	3.56	1.12	4.428	0.000

From the above table it can be noted that the students are highly satisfied towards the various services and facilities provided by the institutions as the mean value for all variables are above 3. One sample t-test is used to assess whether the mean significantly deviates from the mean of the response scale, namely 3. Since the significance level of one sample t-test is less than 0.05 and mean value greater than 3 for all the variables, it is assumed that students have significantly high level of towards the services and facilities provided by their institutions.

VIII. DISCUSSION

- Majority of the respondents in the above study are female and are above 20 years of age. Majority of the respondents are undergraduate hailing from semi-urban area.
- 61.2% of respondents reported innovation means creating new idea, implementing new idea, doing something different.
- 32.4% of the respondents opined that technological advancements led to innovation.
- 27.6% of them felt that innovation generates from Market analysis based on the feedback from Customers, customers and other stakeholders.
- 5.16.8% of them opined that innovation stemmed from R& D Institutions
- 14 % of them believed that innovation cropped out from observing the pain points of Users by the employees of the firm.
- 9.1% reported that innovation might have been developed out of the self-driven interest of the individuals.
- 50% of the respondents reported that Innovation helps in problem-solving using out of box thinking.
- 29.2% of the respondents that it helps to introduce innovative new ideas and technical developments.
- 50% of the respondents reported that Innovation helps in problem-solving using out of box thinking.
- 29.2% of the respondents that it helps to introduce innovative new ideas and technical developments.
- 20.8% of the respondents opined that it helps in discovering new opportunities leading to the development of new products and services.
- 22.4% of the respondents strongly agree that learning environment supports innovation among students in colleges.
- 51.2% of the respondents opined that innovation in education is developed through Seeking knowledge from Listening to experts, reading books and observing others in the environment. 15. 48% of the respondents reported that competency-based learning, flipped classrooms, digital learning are the new innovative learning techniques followed in education.
- 16.44% of the respondents opined that Rote learning (memorising) must be eradicated from colleges.
- 48% of the respondents opined that creative mindset triggers innovation among students.
- 26.8% of them strongly agreed that participating in Ideathons, Hackathons and other business-related competitions and events encouraged them to be creative and innovative in generating new business ideas and opportunities.

- 19.64.8% of the respondents are confident that institutional efforts support in building innovation competencies among student community leading to the initiation of start-up firms within the campus.
- 74% of the students strongly believe that mentorship can support the student community towards initiating start-ups within the campus.
- 78.8% of the students opine that Institutional infrastructure is very important for developing campus ventures within the institution.
- 75.6% of them respond that Innovative mindset and entrepreneurial ecosystem are essential for initiating campus ventures by the student community.

IX. SUGGESTIONS

- Faculty members must be driven towards adopting innovative teaching learning pedagogy like Flipped classroom, Peer learning, Activity based learning and experiential learning techniques.
- Students must be appreciated for out-of-box thinking and encouraged to do things differently in the curricuklar, co-curricular and extra-curricular activities in their colleges.
- Students must be encouraged to organise and attend competitions like Ideathons and Hackathons to generate innovative ideas for solving problems tactfully.
- Efforts must be focussed by the colleges to organise Design thinking workshops to kindle the observation skills, problem solving and innovative skills of students.
- HEI should build confidence among faculty and students and create suitable ecosystem for them to initiate campus ventures.

X. CONCLUSION

Generally speaking, the main purpose of innovation is to improve people's lives. When it comes to managing a business, innovation is the key for making any kind of progress. Small improvements eventually lead to bigger and better ideas that may one day become revolutionary. Likewise, if Higher Educational Institutions (HEI) encourage innovation among student community through introduction of innovative teaching-learning pedagogy, it is inherently possible to create a student pool that is creative and innovative enough to contribute their might in leading a change in our Nation.

BIBLIOGRAPHY

[1] Adams, R., Bessant, J., Robert, P. 2006. Innovation management measurement: A review. International Journal of Management Reviews. Vol. 8, No. 1. pp. 21-47.
[2] Ahmed, P.K. 1998. Culture and climate for innovation. European Journal of Innovation Management. Vol.1, No. 1. pp. 30-43.
[3] Anderson, N., De Dreu, C.K.W., Nijstad, B.A. 2004. The routinization of innovation research: a constructively critical review of the state-of-the-science. Journal of Organizational Behavior. Vol. 25. pp. 147-173.
[4] Armbruster, H., Kirner, E., Lay, G., Szwejczewski, M., Coriat, B., Evangelista, R., Pianta, M., Cozza, C., Belak, J., Belak, J., Duh, M. 2006. Patterns of Organizational Change in European Industry (PORCH). Karlsruhe, Fraunhofer Institute Systems and Innovation Research.
[5] Arupa, T. 2007. Don't Stifle Intuition in Your Workplace. Workplace Training & Development Magazine. June 2007. pp. 76-78. Bar-On, R. 1997.

[6]   Bar-On, R. 2000. Emotional and Social Intelligence. Insights from the Emotional Quotient Inventory. Bar-On, R., Parker, J.D.A. (Eds.). The Handbook of Emotional Intelligence. San Francisco, Jossey-Bass. pp. 363-388.

[7]   Bjornali, E. S., &Støren, L. A. (2012). Examining competence factors that encourage innovative behaviour by European higher education graduate professionals. Journal of Small Business and Enterprise

[8]   Celik, K. (2013). The relationship between individual innovativeness and self-efficacy levels of student teachers. International Journal of Scientific Research in Education, 6(1), 56–67.

[9]   Cerinšek, G., & Dolinšek, S. (2009). Identifying employees' innovation competency in organisations. International Journal of Innovation and Learning, 6(2), 164–177. https://doi.org/10.1504/IJIL.2009.022811

[10] Chatenier, E. D., Verstegen, J. M., Biemans, H. A., Mulder, M., &Omta, O. F. (2010). Identification of competencies for professionals in open innovation teams. R&D Management, 40(3), 271–280. https://doi.org/10.1111/j.1467-9310.2010.00590.x

[11] Donovan, J.; Maritz, P.A.; McLellan, A. Innovation training within the Australian advanced manufacturing industry. Journal of Vocational Education Training 2013, 65, 256–276

[12] Edwards-Schachter, M., García-Granero, A., Sánchez-Barrioluengo, M., Quesada-Pineda, H., & Amara, N. (2015). Disentangling competences: Interrelationships on creativity, innovation and entrepreneurship. Thinking Skills and Creativity, 16(0), 27–39. https://doi.org/10.1016/j.tsc.2014.11.006

[13] Jack, C., Anderson, D., & Connolly, N. (2014). Innovation and skills: Implications for the agri-food sector. Education & Training, 56(4), 271–286. https://doi.org/10.1108/ET-11-2012-0122

[14] Riggio, R. E. (1986). Assessment of basic social skills. Journal of Personality and Social Psychology, 51(3), 649–660. https://doi.org/10.1037/0022-3514.51.3.649

[15] Treffinger, D., Young, G., Selby, E., & Shepardson, C. (2002). Assessing creativity: A guide for educators. Storrs, CT: National Research Centre on the Gifted and Talented.

[16] Wang, C. (2014). A longitudinal study of innovation competence and quality management on firm performance. Innovation: Management, Policy & Practice, 16(3), 392–403. https://doi.org/10.5172/impp.2014.16.3.392.

[17] Wang, D., & Shuai, C. (2013). Does intellectual capital matter? High-performance work systems and bilateral innovative capabilities. International Journal of Manpower, 34(8), 861–879.