SEAAIR
SOUTH EAST ASIAN ASSOCIATION FOR INSTITUTIONAL RESEARCH

Journal of Institutional Research South East Asia

JIRSEA Issue: Vol. 16 No. 2

September/October 2018

ISSN 1675-6061

JIRSEA is indexed with SCOPUS, the Directory of Open Access Journals and EBSCoHost (Education Research Index/Education Research Complete). As provided in the Ulrich's Directory, all journal in the DOAJ are also indexed in the Ulrich's Directory

EDITORIAL BOARD

EDITOR

MEMBERS

EDITORIAL POLICIES AND PROCEDURES

JIRSEA: SUBMISSION OF MANUSCRIPTS

Authors and contributors to the Journal should prepare manuscripts in accordance with these guidelines. These guidelines are designed to standardize the process of preparing the journal for publication. Failure to follow them may result in papers being delayed, and/or rejected.

JIRSEA considers all manuscripts on the condition that:

1. They are original
2. The authors hold the property or copyright of the manuscript
3. They have not been submitted for publication elsewhere
4. They have not been published already
5. They are not under consideration for publication elsewhere, nor in press elsewhere and
6. They use non-discriminatory language.
   If the manuscript is accepted for publication, copyright is transferred to the Journal.

JIRSEA: PUBLISHING POLICY

The Journal for Institutional Research in South East Asia (JIRSEA) is expected to be published electronically on a biannual basis. A third issue was instituted in 2017, and this issue is delimited to the top "Best Paper" and five "Outstanding Papers" selected from the annual SEAAIR Conference by a panel of judges on-site in addition to the full paper reviewed, all of which had undergone the double blind review process by independent international reviewers. Original research papers, which have not been submitted for publication elsewhere, dealing with all aspects of institutional research, planning and related issues in tertiary education will be considered.

All papers are refereed by two independent persons and evaluated according to

1. Significance in contributing new knowledge
2. Technical adequacy
3. Appropriateness for the Journal
4. Clarity of presentation.

Editorial

In this September/October Issue, we continue to have papers from Jordan, Taiwan, our core ASEAN countries of the Philippines, Indonesia, Malaysia and Thailand. These papers continue to cover the diverse interest in governance, teaching & learning and the outcomes of Higher Education. In our continued pursuance of academic research, we continue our aspiration of sharing and learning of these practices across diverse cultural and societal environments.

In the papers focusing on governance, our first two papers from Indonesia and Vietnam looks at leadership's competencies in Indonesian universities and motivations of novice teacher in choosing teaching as a career.

In the papers focusing on our more traditional teaching and learning, five papers looked at cases of Blended/Flipped courses to describe the pedagogic practice in Philippines; cooperative learning and programmed education for skill performance and knowledge Achievement in Jordan; Left-brain and Right-brain Dominance on the relationship between Learning Styles and Language Academic Achievement in Malaysia; teaching-learning experience enhancement by exploring the university student experience in the Philippines and construction of an Automated Test Assembly (ATA) programme from an item bank capable of producing tests in Thailand cases studies.

The last core concentration are in the outcomes of the students with three papers from Taiwan, Jordan and espousing on factors affecting the semester break and dropouts in a case University in order to achieve maximum retention and graduation rates in Taiwan and Challenges that face graduate students in the faculties of educational sciences in Jordanian universities and the Information Technology graduates employability skills meeting the industry needs in China. Key synopsis of each of the papers in this issue are as follows:

- **Dyah Kusumastuti of *International Women University, Bandung, Indonesia*** looks at the required leadership's competencies of effective department heads at Indonesian universities that have gained quality recognition whereby fifteen competencies were identified from the results of the Behavior Event Questionnaire using Cluster Analysis and Whitney-Mann U Test that shows statistical differences between groups.

- **Pham Thi Thanh Hai, Bui Minh Trang, and Nguyen Le Thach** of *Vietnam National University Hanoi and Vietnam Institute of Educational Sciences, Vietnam* investigated motivations of novice teacher in choosing teaching as a career, and identified factors that affect their job satisfaction. It discovered that novice teachers choose teaching mainly for enjoyment from working with children, and opportunities for further studies and that level of satisfaction varied among different location settings. This included the satisfaction of novice teachers of recognition, personal growth, responsibility, pay, administration, superiors, promotion, working conditions, colleagues, school leadership, school reputation and school infrastructure.

- **Jose Aims R. Rocina and Edwin F. Lineses of** *De la Salle University-Dasmarinas, The Philippines* utilizes Ball's performativities and fabrications framework to study cases of informants who have experienced Blended/Flipped courses to describe the pedagogic practice primarily from the vantage points of the students and how they behave in pursuit of their educational interests in a new learning environment. It argues that VLE provides a wider latitude for students to assert their agency in this emerging pedagogic relation.

- **Mo'een Ahmad Oudat of** *The Hashemite University, Jordan* aims to identify the effect of the cooperative learning and programmed education on the level of the skill performance and knowledge Achievement in volleyball, for the volleyball student's course. The results showed statistically significant differences in the skill performance level and knowledge achievement in certain volleyball skills and significant between the post measurements of the two groups in the skill performance level in favor of the first group and no significant differences l between the post measurements of the two groups in the knowledge achievement level.

- **Hui-Suan Wei of** *Multimedia University, Selangor, Malaysia and* **Tajularipin Sulaiman of** *Universiti Putra Malaysia, Selangor, Malaysia* explored the mediation effect of Left-brain and Right-brain Dominance on the relationship between Learning Styles and Japanese Language Academic Achievement. The results showed that Left-brain and Right-brain Dominance had full mediation effect on the relationship between Learning Styles and Japanese Language Academic Achievement.

- **Jesus Alcoba of** *Centro Superior de Estudios Universitarios La Salle, Spain*, **and Susan Mostajo, Olivia Legaspi, Romano Angelico Ebron, Rowell Paras of** *De La Salle University-Dasmariñas, Philippines* delved on learner's experience design for teaching-learning experience enhancement by exploring the university student experience. These results are used in reviewing policies and academic-related services for quality improvement, and to ensure that students have a meaningful university experience.

- **Suwimon Kritkharuehart of** *Ramkhamhaeng University, Thailand,* endeavored to construct an Automated Test Assembly (ATA) programme from an item bank capable of producing tests, and to test the accuracy of the test assembly programme in regard to its test parallelism and test overlap rate using the simulation of test results in relation to the actual test results of 2,800 examinees. The result of the research suggested that this programme was effectively capable of producing parallel tests, which were used to measure the academic performance of examinees in certain levels of ability.

- **T.M. Cheng, H.Y. Hou, D.C. Agrawal and J.Y. Lin of** *Chaoyang University of Technology, Taiwan* investigate factors affecting the semester break and dropouts in a case University in order to achieve maximum retention and graduation rates. This research shows that 'Interest' and 'Learning' problems influenced students' retention or dropout in the case University and college, teacher, and attribute of the curriculum were found to be significant factors to achieve maximum performance.

- **Najwa Abdel Hamid Darawsha of** *Jadar University of Excellence, Jordan* aims to reveal the reality of the Challenges that face graduate students in the faculties of educational sciences in Jordanian universities and suggests solutions that contribute to reducing them from the perspective of the students. The results showed that the challenges that face graduate students in the educational sciences faculties in the Jordanian universities were high with no statistically significant differences across demographics of gender, full-time study, and study schedule.

- **Benqing Dong of** *Dalian Neusoft University, China and* **Chia-Ching Tu of** *China-Dhurakij Pundit University, Thailand* proposed an extended IT-specific employability indicator model by adopting soft skill indicators and further including professional IT skill indicators of computer major graduates whereby the research outcome suggests that the IT industry indeed placed an equal focus on both the soft and professional skills.

Associate Prof. Teay Shawyun, Ph.D.

TABLE OF CONTENTS

PAPERS

Dealing with Self, People and Job Competencies in predicting Effective Department Managers in Higher Education by *Dyah Kusumastuti*	1
Teaching Career and Factors that influence Job Satisfaction of Novice Teachers by *Pham Thi Thanh Hai, Bui Minh Trang, and Nguyen Le Thach*	13
Nuancing Pedagogic Practice in Virtual Learning Environments (VLE): Cases of Student Performativities and Fabrications by *Jose Aims R. Rocina and Edwin F. Lineses*	36
Effect of Cooperative Learning and Programmed Education on the level of Skill Performance and Knowledge Achievement in Volleyball by *Mo'een Ahmad Oudat*	47
The Effect of Brain Dominance on the Relationship between Learning Styles and Japanese Language Academic Achievement by *Hui-Suan Wei and Tajularipin Sulaiman*	59
Exploring the University Student Experience by *Jesus Alcoba, Susan Mostajo, Olivia Legaspi, Romano Angelico Ebron and Rowell Paras*	72
The Reliability and Validity of Test Construction from Item Bank based on Item Response Theory by *Suwimon Kritkharuehart*	89
Modeling retention in a private University of Technology: Improving the odds of undergraduates by *T.M. Cheng, H.Y. Hou, D.C. Agrawal and J.Y. Lin*	109
The Reality of the Challenges Faced By Graduate Students in The Faculties of Educational Sciences In Jordanian Universities by *Najwa Abdel Hamid Darawsha*	123
Meeting Industry's Requirements – A Study on the IT Graduate Employability Indicators by *Benqing Dong and Chia-Ching Tu*	141

Dealing with Self, People and Job Competencies in predicting Effective Department Managers in Higher Education

Dyah Kusumastuti
dyahk05@gmail.com
Faculty Social Science & Business
Wanita Internasional University/
International Women University
Bandung - Indonesia

Abstract

This paper aims to identify the required leadership's competencies of effective department heads at Indonesian universities that have gained quality recognition. Behavior Event Interview and a Questionnaire were used as the methodology for this purpose. These were administered on Heads of Study Programs and/or Heads of Department at some Indonesian universities listed in the QS and Ministry of Research, Technology and Higher Education rankings. Fifteen competencies were identified from the results of the Behavior Event Interviews while the Questionnaire responses were examined using Cluster Analysis and Whitney-Mann U Test. The results show statistically significant differences between Heads of Departments who meet the competencies requirements and those who do not. This finding allows the determination of *Core Competencies* required of an effective Heads of Departments and therefore could assist in developing their selection criteria.

Keywords: Leadership, Competencies, Heads of Departments, Higher Education

Introduction

Higher Education (HE) in Indonesia has the potential and strength to shape the competitiveness of the country. Indonesia has the fourth largest population in the world of about 260 million living on many islands across the 5000 km archipelago (BPS, 2013). However, currently only eleven out of over 4000 Higher Education Institutions (HEIs) in the country made it into the QS ranking (QS Ranking, 2016) and even then they could only manage ranks beyond the 700th. In total there are 24000 Study Programs / departments, 260 000 lecturers and 6 million students (PDDIKTI, 2016).

University leadership is a critical success factor for HEIs in pursuit of quality competitiveness. In order to boost the quality of the country's HEIs, the Indonesian Ministry of Research, Technology and Higher Education (MoRTHE) ranks the country's HEIs since 2015, on the basis of an aggregate score comprising weighted Quality of Human Resources, Quality of Research, Quality of Management and Quality of Student Activities (Kusumastuti & Idrus, 2017a).

In general, the leadership structure of HEIs in Indonesia is made up of a Rector at the top, Deans and then Heads of department (HoDs). Leaderships in HEIs become particularly important as they act both as academic leaders and as organizational managers of the HEI.

HoDs as leaders relate directly with lecturers and students. They also decide on the educational requirements such as curriculum and learning methods. HoDs will need leadership competencies to harmonize these three responsibilities in order to synergize towards departmental excellence. The university's overall performance depends on the contributions of Departmental leadership performances. With the current number of 19, 373 university departments in Indonesia (PDDikti,2016) there are therefore that same number of HoDs around the country. This leadership needs to be developed so that at the time of appointment they already have sufficient qualifications even though qualifications do not describe practical capabilities as a HoD.

Discussions on the needs of HEI leaders are rarely held. If anything such discussions are normally centered on limits and sanctions that are imposed on the leaders while their roles as potential administrative leaders are not complemented with authorities. Currently, HoDs are voted by lecturers in the department.

It is therefore extremely important to identify the leadership competency requirements of HoDs and through this research determine the leadership needs of Indonesian HoDs in order to allow them to manage their departments effectively and produce high quality graduates.

The concept of higher education leadership

Spendlove (2007) opined that the strength of a university system lies in the independent thinking, creativity and autonomy of the people who work within it. Yet according to Middlehurst (1993) the nature of decision making in majority of HEIs is in fact collective collegiate. So, what sort of leaderships and leadership development are most effective?

Leaderships in higher education need a specific treatment. Being different from government departments or industry, the performance of academic communities could only develop when there is a high level of academic freedom at the institution.

Heads of departments play a critical role in providing evidence that contribute to making a university with recognized global quality. The ranking of higher education institutions in Indonesia is based on the quality of academic human resources, the quality of management, the quality of research and the quality of student activities (Kusumastuti & Idrus, 2017a), each of which is defined by weighted quantified measures that enable summation of the scores that are used to position the HEI in the national rank.

Nevertheless, traditional leadership and management skills continue to be prerequisites although in the face of the fourth industrial revolution, higher education and its leaderships have little option other than to adopt a revolutionary approach as well (Herold, 2016; Bolden & O'Reagan, 2016; Collins, 2014; Gleason, 2018).

The amount and advancement of technology that the 4th Industrial Revolution brings, such as artificial intelligence, MOOCS and the like drive changes not only in the technology employed by HEIs but more importantly on leadership styles, roles and substance. The technology also impinges on how learning is conducted. The pervasive influence of new technology particularly computers, laptops, mobile technology with its 'Apps' and the increasingly cheaper internet connection costs also reconfigured students' expectations about learning and honed their career desires. The ever accelerating explosion of technologies and associated products also revolutionizes the thinking about equipping HEIs with such facility. Purchasing versus leasing of equipment for example, could need a leader different than those who could not see facilities as such. That is, facilities as a means towards achieving an aim. HEIs are not in the business of owning capitals.

Thus, what is the concept of HE leaderships? As is the case with other leaderships, a concept of leadership now appears to be ephemeral at best. This immediately means that leaders have to be *flexible* if they wish to survive in the environment that changes continuously and ensure the HEI's survival through the unpredictable challenges.

Given such an environment, part of the leaders' roles will need to provide a measure of calmness and stability so that the real work can proceed in a steady and unflustered manner.

Such environment also means that leadership as a concept will continually evolve and the term concept itself will experience a rapid evolution as well.

The Competency Approach in Leadership Development in Universities

Competence is defined as an intent-based ability supported by actual experience.This has been found to influence or can be used to estimate the level of workplace performance or problem-solving ability in a given situation (Drew, 2010; Babu, 2016; Jeffrey, 2016).

Emotional Social Competency Intelligence (ESCI) in Leadership

Emotional Intelligence (EI) can enhance leaders' ability to communicate effectively and to transform them into democratic leaders. Leaders who are able to maintain peace in times of stress and confusion will also be able to navigate and build consensus. For that EI becomes important for all levels of leadership (Boyatsis, 2009).

The individual competencies for emotional intelligence include: 1.Emotional self-awareness, 2) Emotional self-control, 3). Adaptation/Flexibility; 4) Achievement orientation; and 5) Having a positive outlook (Drew, 2010; Boyatsis, 2009). It was also found (Boyatsis, 2009; McLeland, 1973; Spencer and Spencer, 1993; Goleman et al, 2015) that Social, Emotional and Intellectual/Cognitive Competence can be used to predict the effectiveness of leaders, professionals and managers.

Therefore, it is necessary to find the competencies that become the needs of the organization and a factor that must be developed for its individual leaders. Further research variables are developed based on the results of BEI & questionnaire that can be seen in Tables 1 and 2 shown in the Results and Discussions section.

Research Methodology

Data on required HoDs' competencies are collected through Behavior Event Interview (BEI) of 27 HoDs. A survey instrument was also administered on them in order to determine their competence levels.

BEI is an interviewing technique using *Situation-Action-Result* (SAR) type of questions sometimes known by the epithet 5W + 1H. The 5W consists of questions such as ***What*** was the situation?***, What*** was your role or responsibility?***, Who*** was involved?***, What*** did you do?***, What*** were the outcomes? and ***How*** did you feel about that?

This was followed by a survey questionnaire administered on the 27 HoDs. The responses indicate the type of competencies each HoD possesses and thereby not possesses. Responses would also indicate the depth of commitments that could be divided into two levels, namely Level 1 and Level 2.

From the results of this questionnaire, Cluster Analysis was used in order to group HoDs with allied competencies together in *clusters*.

Whitney-Mann U Test was then used to carry out a *difference analysis* to distinguish these clusters. Through the difference analysis the following are identified:

- common competencies,
- those that exist in one cluster but not in the other and
- those which are statistically different and potentially capable of identifying *core competencies*

These may be extracted from the test. All of these different competencies are core competencies of leading HoDs while the common competencies become base competencies for all HoDs.

Descriptive conclusion was then advanced to help identify effective HoDs.

Results and Discussion

The results of the first part of the investigation, namely BEI involving interviews with 27 HoDs from "A" accredited HEIs yielded 15 competencies required of effective leaders. These are categorized into three major 'Dealings' shown in Table 1. Clearly an effective leader needs to be able to deal with him/herself, able to deal with others/people and able to deal with own and other's jobs. Five components of and forming each of the categories have also been identified. Both the categories and their respective components are reasonably expected and definitions of each component have been formulated (Kusumastuti, 2012). These then formed a *Competency* dictionary. This essentially completes the first part of the investigation.

Table 1 – Results of BEI with 27 HoDs from recognized HEIs

Dealing with Self	Dealing with People	Dealing with Job
Self Awareness (SA)	Teamwork (TW)	Planning (PL)
Self Management (SM)	Communication (CO)	Execution (EX)
Personal Mastery (PM)	Conflict Management (CM)	Improving Organization (IO)
Adaptability (AD)	Managing People & Coaching (MP)	Managing System (MT)
Creative Thinking (CT)	Self Confidence (SC)	Entrepreneurship (ET)

Each of the above is then defined as shown in Table 2 and segregated into two levels to indicate the depth of commitment under that definition.

Table 2 – Types, Definitions and Levels of competencies

Competencies Dealing with Self	
1. Self-Awareness (SA), Definition: Capacity to take note of oneself, understand one's emotion, strengths and limitations using own sensitivity, values and motivation.	
Level	**Behavioral Description**
1	Knowing self, understanding limitations of self, calculating effects of self onothers, controlling self, able to articulating objectives, values embraced, adopting positive outlook, using instincts in decision making.
2	Knowing self, understanding limitations of self, calculating effects of self onothers, controlling self, able to articulating objectives, values embraced, adopting positive outlook, using instincts in decision making.
2. Self-Management (SM), Definition: Capacity to manage oneself as a leader in the higher education world by energy to articulate mental requirements and cognitive behaviours Code Competency: Dealing with self of positions at an HEI.	
Level	**Behavioral Description**
1	Showing positive behaviors, expressing care, maintaining calmness under pressure, capable to utilize others talents and abilities
2	Showing positive behaviors, expressing care, maintaining calmness under pressure, capable to utilize others talents and abilities
3. Personal Mastery (PM), Definition: Capacity to continuously improve oneself and self-awareness in order to maintain professionalism, continually improving knowledge and seeking potentials to learn and getting feedbacks	
Level	**Behavioral Description**
1	Demonstrated commitment to self-development, creating learning opportunities to enhance work effectiveness and efficiency in anticipation of future tasks.
2	Implementing new ideas and creative work that improve performance in the work unit/organization through acceptance of the business processes by all stakeholders
4. Creative Thinking (CT), Definition: Capacity to resolve problems through logical thinking and using knowledge, informed data and experiences from the past.	
Level	**Behavioral Description**
1	Has an open mind for new ideas and innovative solutions to problems
2	Implementing new ideas and creative work that improve performance in the work unit/organization through acceptance of the business processes by all stakeholders
5. Self Confidence (SC), Definition: Faith on one's ability in achieving the mission of their work.	
Level	**Behavioral Description**
1	Clearly position oneself in scholarly debates
2	Accept challenges of new and complex tasks

Competencies Dealing with Other People

6. Adaptability (AD), Definition: Capacity to adjust to environmental changes and has the initiatives to manage changes effectively, values differences in opinion, works effectively with various colleagues and different groups.

Level	Behavioral Description
1	Initiate changes on colleagues in the work unit/department
2	Facilitates changes in the work unit

7. Teamwork (TW), Definition: Capacity to weave work group and to develop co-operation to achieve objectives. Creates a spirit of friendship and trust in teams; group team members to achieve and through common goals and develop the spirit of team learning.

Level	Behavioral Description
1	Developing partnership to improve group productivity.
2	Develop work relationships with other organizations

8. Communication (CO), Definition: Capacity to communicate in order to convince using effective techniques such as active listening and correct interpretation of non-verbal signals. Considerate of colleagues' and staff's thoughts and ideas; choosing and using appropriate message and media instruments; effective persuasion, influence and team work.

Level	Behavioral Description
1	Listen to interpret, adopt clear and accurate communication to gain correct messages convincing others through thinking and involving them in open discussions.
2	Seek feedbacks proactively on various issues, convincing others through thinking and involving them in open discussions.

9. Conflict Management(CM), Definition: Effectively and constructively manage and handle conflicts between people about sensitive matters.

Level	Behavioral Description
1	Understand the problem from all perspectives, clarify conflict situation by collating information from various sources.
2	Use appropriate communication styles to resolve conflicts.

10. Managing People &Coaching (MP), Definition: Ensure that everybody can fully realize their potentials; provide feedback, coaching and counselling; recognize and reward excellent performance; motivate and inspire staff to growth.

Level	Behavioral Description
1	Develop subordinates by sharing experiences with colleagues, providing constructive feedbacks and recognize colleagues excellence performance
2	Ensure human resource development, regeneration and the future

Competencies Dealing with Job as HoD

11. Planning (PL), Definition: Capacity to design and organize tasks according to the higher education institution's requirements by determining objectives and anticipating requirements and priorities .

Level	Behavioral Description
1	Efficiently plan and simultaneously organize tasks.
2	Create alternative plans, identify potential hurdles and develop contingencies in anticipating them as part of the capacity of the unit under his leadership.

12. Execution (EX), Definition: Able to harness technology, human resources and processes to advance implementation and control, respond to new development, monitor, evaluate and evaluate advances, adjust and implement plans, guarantee mission completion.

Level	Behavioral Description
1	Arrange human resources to maximize effectiveness. Determine standard,monitor and oversee tasks to meet targets in the department/study program.
2	Synergize human resources to raise capability.

13. Improving Organization (IO),Definition: Use initiatives to recognize change requirements of the organization, manage organizational change and seek methods .

Level	Behavioral Description
1	Implement organizational changes.
2	Effective methods for organizational improvements.

14. HE Management System (MT), Definition: Capacity to use knowledge and expertise in managing globally recognized quality.

Level	Behavioral Description
1	Manage business processes in study program as service.
2	Manage business processes in faculties as service.

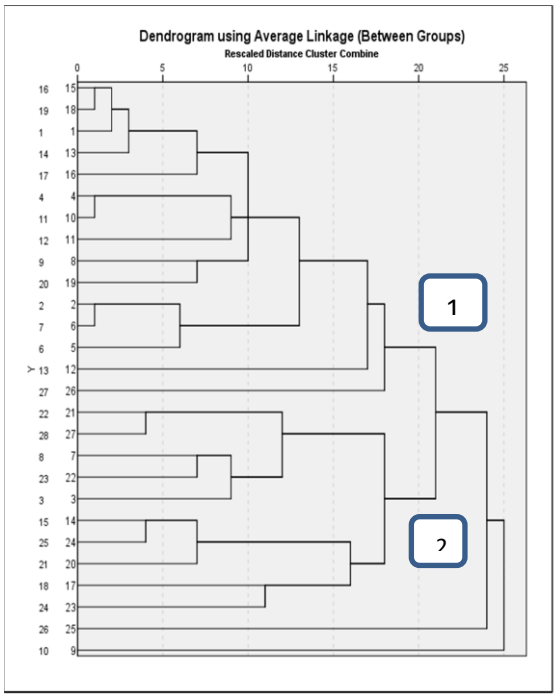
15. Entrepreneurship (ET), Definition: Capacity to seek, create and apply work processes, technology and new product to empower organizations, to optimize human resources in the effort to expand service quality.

Level	Behavioral Description
1	Develop more practical methods by harnessing more efficient and effective resources.
2	Raising performance. Improve performance.

Source: Result from research data; numbers 1 and 2 indicate the level of Leadership Competency

The second part of the investigation is an ordinal competency survey/questionnaire of the HoDs in order to identify those who are already *leaders* (here referred to as Level 2) as they met all the competency requirements, and those who have the potential to be leaders but require further enhancements (referred to as Level 1) as they lacked a number of the required competencies. In other words, each of the components of 'Dealings' shown in Table 1 carries either a response

assessment at Level 1 or Level 2. Cluster Analysis using SPSS version 24 was then used to determine the Level 1 and Level 2 clusters shown in a Dendogram in Fig. 1.



Sample Number of Cluster 1 Respondent	Sample Number of Cluster 2 Respondent
15	21
18	27
1	7
13	22
16	3
4	14
10	24
11	20
8	17
19	23
2	25
6	
12	
26	

Fig. 1 – Cluster Analysis results showing the Dendogram and the respondents with Cluster 1 and Cluster 2 leadership competencies

The Whitney-Mann U Test was used in order to detect significant differences between response levels. Table 3 shows that out of the 15 competencies investigated only 3, namely Creative Thinking (CT), Conflict Management(CM) and Self Confidence (SC) show statistically significant differences at the probability level of α=0.05.

Table 3 – Whitney-Mann U Test results

Competency	*Sign.p-value*	*α=0.05*	Competency	*Sign.p-value*	*α=0.05*	Competency	*Sign.p-value*	*α=0.05*
SA	0.973	ND	TW	0.743	ND	PL	0.092	ND
SM	0.216	ND	CO	0.900	ND	EX	1.000	ND
PM	0.543	ND	CM	**0.000**	D	IO	0.606	ND
AD	0.471	ND	MP	0.455	ND	MT	0.38	ND
CT	**0.000**	D	SC	**0.002**	D	ET	0.75	ND

(D=Differences confirmed; ND=No difference at α=0.05)

This would indicate that HoDs who have superior levels of CT, CM and SC have significantly more contribution to the excellence of their departments. This was not determined in this research investigation.

By the same token, Table 2 also shows that 5 out of the other 12 competencies, namely Self Management (SM), Adaptability (AD), Managing People & Coaching (MP), Planning (PL), Managing System (MT) and Self Management (SM)are also highly desirable competencies that should be held by effective HoDs.

Conclusion

This research investigation was motivated by the need to identify factors contributing to quality HEIs. Noting findings in the literature, HoDs' competencies were chosen as one of these factors. Literature review revealed a number of potential competencies that could be investigated. Descriptive analysis using Behavior Event Interviews (BEI) and a Survey questionnaire resulted in identifying fifteen critical competencies of effective HoDs that will help bring the HEI to be globally recognized. Eight of these fifteen appear to be able to differentiate effective HoDs from those who only meet the basic but prerequisites competency requirements. In turn, three of these eight were proved statistically and significantly to differentiate the two groups of respondent HoDs in the study. These are Creative Thinking (CT), Conflict Management (CM) and Self Confidence (SC) which then becomes the core competencies required of effective HoD leadership.

The findings are able to be used to determine and select potentially effective HoDs who will lead their departments and thereby their HEIs towards global recognition.

Further research is required to fine-tune the results and expand the scope of HEIs to include others in the country thus making the study more inclusive and more useful.

Acknowledgment

The author would like to express her heartfelt gratitude to the Indonesian Ministry of Research, Technology and Higher Education (MoRTHE) under whose grant (Contract number 0786/K4/KM 2018) this research was carried out.

References

Babu, M .(2016), Characteristics of Effective Leadership of Community College Presidents, Thesis Doctor of Philosophy, Case Western Reserve University, http://rave.ohiolink.edu/etdc/view?acc_num=case1461100084, accessed 21 December 2017

Bolden, R. and O'Regan, N. (2016), Digital disruption and the future of leadership: An interview with Rick Haythornthwaite, Chairman of Centrica and MasterCard. *Journal of Management Inquiry*, 25 (4). pp. 438-446. ISSN 1056-4926. DOI: 10.1177/1056492616638173

Boyatzis, R.E. (2009), Competencies as a behavioral approach to emotional intelligence", Journal of Management Development, Vol. 28 No. 9, pp. 749-70.DOI 10.1108/02621710910987647

Boyatzis, R.E., Smith, M.L., Oosten,E.V., & Woolford,L.(2013). Developing resonant leaders through emotional intelligence, vision and coaching. *Organizational Dynamics, 42*,17-24. doi:10.1016/j.orgdyn.2012.12.003.

BPS (2013) – Bureau of Statistics, Indonesia, *Population Projection*, 2010-2035, ISBN: 978-979-064-606-3, Publication Number: 04110.1301

Collins, J.P. (2014) Leadership and change in Twenty-first Century higher education, Bioscience, 64, 7, 561–562, https://doi.org/10.1093/biosci/biu080alsohttps:/academic.oup.com/bioscience/article/64/7/561/2754155, accessed 21 Apr 2018

Drew,G. (2010) Enabling or "real" power and influence in leadership, *Journal of Leadership Studies,* Volume 4, Number 1, 2010, ISSN: 1935-262X,pp 47-58, https://doi.org/10.1002/jls.20154,

Dreyfus, C.R.(2008) Identifying competencies that predict effectiveness of R&D managers', *Journal of Management Development*,Vol.27, No.1,pp.76–91, Philadelphia, Pennsylvania, USA.DOI 10.1108/02621710810840776

Goleman D, Boyatzis R, McKee A (2002) Primal leadership: realizing the power of emotional intelligence. Harvard Business School Press, Massachusetts, USA.

Gleason, N.[Ed] (2018) Higher Education in the era of the Fourth Industrial Revolution, Pelgrave MacMillan, ISBN 978-981-13-0194-0 DOI 10.1007/978-981-13-0194-0

Kandula, S. R (2015), Competency -Based Human Resource Management , Published by Asoke K. Ghosh, PHI Learning Private Limited, Rimjhim House 111, ISBN --978-81-203-4706-2

Kusumastuti, D. (2012), Identifying competencies that predict effectiveness of disaster managers at local government, *International Journal of Society Systems Science*, Inderscience, Geneve, pp. 159-176

Kusumastuti, D. and Idrus, N. (2017a) Nurturing quality of higher education through national ranking: a potential empowerment model for developing countries, *Quality in Higher Education*, 23, 3, 230-248, DOI: 10.1080/13538322.2017.1407400

Kusumastuti, D. and Idrus, N. (2017b) Indonesia at a higher education cross road: Is WCU the right path? *Jnl. Institutional Research South East Asia*, v. 15 n. 1, pp. 81-93

McClelland, D.C. (1973) Testing for competency rather than intelligence, *American Psychologist*, Vol. 28 No. 1, pp. 1-40.

PDDIKTI. (2016), Jumlah Perguruan Tinggi Indonesia, [The number of Indonesian higher education institutions] http://kelembagaan.ristekdikti.go.id/index.php/statistik-5/ accessed December 2017

QS, *QS World University Rankings 2015-2016*, https://www.Topuniversities.com/university-rankings/world-university –rankings/, accessed 17 September, 2017

Reif, R. (2018) A survival guide for the fourth industrial revolution, https://www.weforum.org/agenda/2018/01/the-fourth-industrial-revolution-a-survival-guide/ accessed 06 April 2018

Schwab, K. (2016) The Fourth Industrial Revolution, World Economic Forum, https://www.weforum.org/ accessed 05 April 2018 Schwab, K. (2018) Biography https://www.weforum.org/about/klaus-schwab accessed 05 April 2018

Spendlove. M, (2007) Competencies for effective leadership in higher education, *International Journal of Educational Management*, Vol. 21 Issue: 5, pp.407-417, https://doi.org/0.1108/09513540710760183

Spencer L. M. and Spencer, S. (1993), Competence at work, John Wiley & Sons Inc. New York

Teaching Career and Factors that influence Job Satisfaction of Novice Teachers

Pham Thi Thanh Hai

University of Education, Vietnam National University Hanoi, Hanoi, Vietnam

Bui Minh Trang

University of Education, Vietnam National University Hanoi, Hanoi, Vietnam

Nguyen Le Thach

Vietnam Institute of Educational Sciences, Hoan Kiem, Hanoi, Vietnam

ABSTRACT

This study investigated motivations of novice teacher in choosing teaching as a career, and identified factors that affect their job satisfaction. Data were collected through surveying 320 novice teachers in seven Vietnamese provinces. The results showed that novice teachers choose teaching mainly for enjoyment from working with children, and opportunities for further studies. The study also investigated the satisfaction of novice teachers in accordance to recognition, personal growth, responsibility, pay, administration, superiors, promotion, working conditions, colleagues, school leadership, school reputation and school infrastructure. Finally, the study discovered that level of satisfaction varied among different location settings.

Keywords: novice teachers; job satisfaction; teaching career; work performance; work motivation

Introduction

A strong education system is vital for a developing country, and needs competent teachers at its core. McKinsey's report "How the world's best-performing school systems come out on top" provides ample evidence to suggest that the quality of teachers is fundamental to the performance of students (Barber and Mourshed, 2007). Increasingly many educators and researchers agree. For example, student performance has been shown to be strongly influenced by the professionalism of teachers (Desimone, 2009; Yoon, Ducan, Scarloss & Shapley, 2007), as well as their international competitiveness (Wei and Darling-Hammond, 2009). But perhaps most importantly, a school's accomplishments and the performance of its students are largely determined by how satisfied the teachers are with their job (Pepe, Addimando & Veronese, 2017).

When it comes to job satisfaction, teaching as a profession comes with great challenges (Mansfield, Beltman, Broadley &Weatherby-Fell, 2016). Many factors, including working conditions, status, and accomplishments, affect a teacher's actions and his or her teaching performance (Grion and Varisco, 2007). Teachers are also among professions that report the highest level of stress and dissatisfaction (Lomas, Medina, Ivtzan, Rupprecht, & Eiroa-Orosa, 2017). At a time when other careers offer higher salaries, clearer pathways for development, greater social prestige, and better working conditions (Organization for Economic Cooperation and Development [OECD], 2005; Ramsay, 2000), teaching seems to be less attractive than it was 30 years ago. With an increasing shortage of teachers, there has been global interest in understanding what motivates people to choose teaching as a career, and what motivates them to persist in it, especially since the job has become more complex and demanding (OECD, 2005). Novice teachers have to spend few years in the beginning to reach to the level of expertise; however, before attaining that level, approximately 40-50% of teachers quit the profession in the first five years (Fantilli and McDougall, 2009). Several investigations point out several challenges that novice teachers encounter in the transition period, including becoming independence, dealing with praxis shock, reality shock or transfer shock (Chaaban and Du, 2017).

While a large body of research on job satisfaction of teachers has been conducted in developed countries, little has been done in developing countries (Liu and Onwuegbuzie, 2014). In Vietnam, there are many studies on teacher students, teachers and primary education teachers (Trần, 2006, Nguyen, 2010, Pham, 2009). However, studies on choosing teacher's job and teachers' job satisfaction are quite limited in scope. Most novice teachers choose primary education teacher's job because of their interest in children (Dinh et al, 2017). Many teachers complain about having to do a lot of work at schools so there is not enough time to teach well (Pham,1986). In fact, teachers have difficulty in professional development. Training the teachers and requesting for interest in the experience and characteristics of the teaching environment. Most teachers said that they cannot use the knowledge of the training course in practice teaching locally (Trần & Le, 2017). Research on developing the quality of novice primary teachers to meet the renewal requirements and to enhance the quality of the general education (Authors, 2018) shows that novice primary teachers need professional and teaching skills support but they have not received direct professional support from management staff,

especially principals. Professional training courses and pedagogical training are well appreciated; however, half of the novice teachers have not permitted to attend professional training courses. Teachers are facing a number of factors that influence on professional development such as lack of opportunities for professional development. For example, the study by Tran and Le (2015) is done at high school level, while Duong (2013) addresses only university level. This study, in addressing this gap in research, attempted to build an understanding of why Vietnamese novice teachers choose the profession, and factors that affect their job satisfaction. The study was carried out through a quantitative research of 320 novice teachers in primary schools across seven Vietnamese provinces, from the North to the South. It is hoped that the findings in this study will contribute to the existing literature, and provide guidance for school management, policy makers, and curriculum developers to improve the working environment and commitment of novice teachers, as well as to provide better support for them.

1.1. Teaching as a career

The motives of teachers who choose teaching as a career fall into three main categories: extrinsic (e.g., salary or lengthy holidays), intrinsic (e.g., interest, personal experience, or intellectual fulfillment), and altruistic (e.g., the desire to contribute to the growth of others) (Moran, Kilpatrick, Abbott, Dallat, & McClune, 2001; Brookhart and Freeman, 1992). Indeed, according to the OECD report, the most important reasons for the decision of becoming a teacher are: working with children and adolescents, making a social contribution, making a difference, job security, job benefits, enjoyment of teaching, compatibility with other interests and activities, compatibility with family life, and self-education (OECD, 2005).

Since 1950s, several theories of career choice have been developed. According to one of the earliest theories -- Super's self-concept theory - the question "Who am I?" is a determinative factor in an individual' choice of profession (Super, 1953). Yet Gottfredson claims two variables that form the occupation choice: sex-type rating and prestige level, in which an individual selects a career through considering its appropriateness to his or her gender and its level of prestige (Gottfredson, 1981).

Mainstream research finds that the motives behind choosing teaching as a career derive from intrinsic, extrinsic and altruistic attractors. For example, Hayes (1990) and Stiegelbauer (1992) both suggest that the altruistic reason of making a positive change in children's lives is the most substantial motivation. On the other hand, the study on student teachers in England and Norway place more emphasis on intrinsic reasons (Kyriacou, Hultren, & Stephens, 1999). In their study, the majority of pre-service teachers choose "enjoying teaching" and "enjoying working with children" higher than the other factors. Yet, Sinclair (2008) finds that primary pre-service teachers assert that working with children are their fundamental motivations besides the work being intellectually encouraging.

It is seemingly difficult to pinpoint the reasons for teaching as a career choice. Kyriacou et al., (1999) suggest that the differences in cultural, social, and economic settings, as well as in subjects being taught by the teachers cause variations in responses across studies. Certainly,

motivations for career choice often stem from personal values and expectations, experienced in particular sociocultural settings within the context of different demand and reward structures (Watt et al., 2012).

1.2. Job satisfaction in teaching

Job satisfaction is considered a motivating factor, and refers to how teachers generally feel about their jobs (Skaalvik and Skaalvik, 2015; Locke, 1976). Job satisfaction stimulates teachers' enthusiasm, teacher-student relationships, and teacher retention (Skaalvik and Skaalvik, 2010). When teachers are motivated and have a high degree of job satisfaction, their students perform better and become more motivated, resulting in the teachers themselves being motivated by their students' success. This positive cycle often continues (Czubaj, 1996).

One of the most well-known theories of job satisfaction in educational settings is that of Herzberg, Mausner and Snyderman's (Dinham and Scott, 2000). Dinham and Scott (1997) claim that different job motivators affect job satisfaction directly. Certainly, there have been attempts to explain job satisfaction as a dependent variable described by numerous factors. According Maslow's hierarchy of needs (1943), which is commonly used in explaining human behavior, people have five categories of needs, following a specific order. In contrast, Herzberg's theory identifies two set of job variables affecting people's attitudes toward their work: satisfiers and dissatisfiers. Satisfiers include recognition, responsibility for one's work, personal growth, achievement and advancement. Dissatisfiers (hygiene factors) include relationships with colleagues and supervisors, pay, work conditions and security (Herzberg, Mausner, & Snyderman, 1959). The absence of hygiene factors can create job dissatisfaction, but their presence does not motivate or create satisfaction. Satisfiers are associated with long-term positive effects in job performance, while hygiene factors consistently produce only short-term changes in job attitudes and performance, which quickly fall back to its previous level. Although Herzberg's two-factor theory has been widely applied, it has also been criticized for being too reliant on a specific methodology, and for being limited in the number of categories. Vroom (1964) proposes that seven aspects should be considered as key components of job satisfaction, including: administration, promotion, job nature, superiors, salary remuneration, working conditions, and colleagues (Vroom, 1964).

Job satisfaction of teachers have been shown to positively affect individuals and schools in several studies (Corbell, Osborne, & Reiman, 2010; Høigaard, Giske, & Sundsli, 2012; Malinen and Savolainen, 2016). Fantilli and McDougall (2009) remark that many teachers exit the profession before making an impact on student achievement. The first year is generally considered the most difficult in a teacher's career, when novice teachers have to assume the same duty as experienced teachers (Fantilli and McDougall, 2009). Tait (2008) emphasizes that novice teachers who have high levels of job satisfaction are more motivated, committed and determined to remain in the profession, despite high job demand. Consequently, highly motivated novice teachers focus their energy mainly on the growth of their students and their own (Lam and Yan, 2011), leading to increased efficiency and improved educational outcomes (Moè, Pazzaglia, & Ronconi, 2010). Chaaban and Du (2017) conclude that with job

satisfactions, novice teachers form healthier connections among co-workers and collaborate better with supervisors. On the other hand, factors such as dissatisfaction with the teaching environment, hindrance in communicating with others, disappointment with mentoring support, are often found in the novice teachers about to quit their job (Chaaban and Du, 2017).

Because of increasing concern about teacher satisfaction, Dinham and Scott (1997) measure teacher motivation, satisfaction, and health. Their findings indicate that the most significant aspects in determining teacher satisfaction come from intrinsic factors of Sergiovanni (1967) and Herzberg et al. (1959). However, slightly differently from Sergiovanni, Dinham and Scott see altruism and personal growth to be the most influential intrinsic factors. Other studies have discovered that teachers generally derive job satisfaction from factors integral to teaching, namely helping children grow, developing good relationships with students, and experiencing self-growth (Lam and Yan, 2011). These studies, similarly to Dinham and Scott (1997), also show slight changes over time in the specific intrinsic factors that influence teachers. Some studies show that hygiene factors, including increasing workloads, low status in their society, and low salaries (Lam and Yan, 2011) as well as reduced teacher autonomy (Moore, 2012; Shann, 1998) contribute to teacher dissatisfaction. In general, the findings unanimously suggest that intrinsic factors shape teacher job satisfaction.

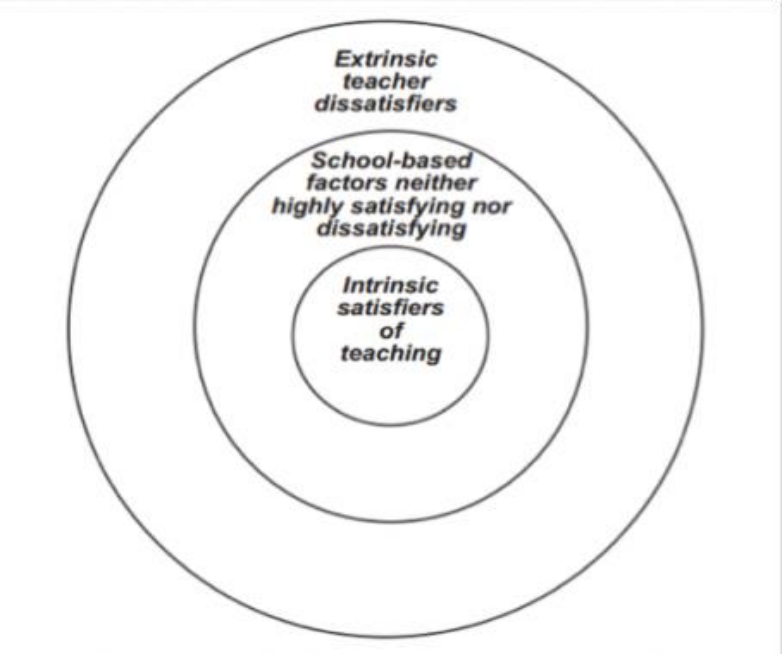


Figure 1. A three-domain model of teacher satisfaction.

Source: Reprinted from Dinham & Scott (2000, p. 393).

While the similarities in these findings are significant, there is one major difference. Dinham and Scott (1997, 2000) also identify so-called school-based factors, which fall between the intrinsic rewards and extrinsic hindrances, and which is where there is most variation among schools. School-based factors include school leadership, climate and decision making, and

school reputation and infrastructure (Dinham and Scott, 1997). These school-based factors differ from satisfiers because they are not intrinsic to teachers and they differ from hygiene factors because they have the capacity to increase job satisfaction (Dinham and Scott, 1998). Skaalvik and Skaalvik (2011) find that teachers' sense of belonging, often associated with job satisfaction, can be connected to supervisory support (Figure 1).

School working conditions in fact can negatively affect job satisfaction of novice teachers (Dinham and Scott, 1997; Lam and Yan, 2011; Rhodes, Nevill, & Allan, 2004). Novice teachers often report that they teach classes in multiple rooms and have inadequate supplies or equipment (Johnson, 2004). A recent research on teacher stress, job satisfaction and teaching efficacy underlines an association between accessibility of resource and job satisfaction (Collie, Shapka, & Perry, 2012). Clotfelter, Ladd, & Vigdor (2005) and Johnson (2004) show that they have to handle more demanding tasks than their experienced colleagues. In a survey of 486 first- and second-year teachers by Kardos and Moore Johnson (2007), 36% of teachers report that they have heavy workload, and 52% do not have enough time for planning and preparation. Lam and Yan (2011) note that *"when the school environment allows for teachers to focus on the core business of teaching and allows a reasonable work-life balance, teachers are more likely to become engaged in teaching"* (p. 345). To provide a basis for planning, policy making, and enhancing teacher commitment, this study investigated specific variables commonly associated with job satisfaction and dissatisfaction.

1.3. The Vietnamese educational context

Education in Vietnam is arranged on a national level by the Ministry of Education and Training (MOET). The education levels and training levels of the national education system include (Vietnam Ministerial 1981/QD-TTg):

a) Pre-school education includes kindergarten and pre-primary education;
b) General education includes primary education, lower secondary education and upper secondary education;
c) Vocational training for elementary, intermediate and college levels;
d) Higher education offers undergraduate, master and doctoral degrees.

The qualification system has been divided into 8 level: Level 1 - Elementary Level I; Level 2 - Elementary level II, Level 3 - Elementary level III, Level 4 - Intermediate level; Level 5 - College; Level 6 - University; Level 7 - Master; Level 8 - PhD. (Vietnam Ministerial 1982/QD-TTg).

Teacher education institutions are subjected to state management by the MOET (Vietnam Governance 2009). Standard academic requirements for primary teachers is set to be from Pedagogy graduate (colleges of 2-3 years).

Teachers are required to attend annual regular professional training. The regular training program for primary teachers consists of 3 arrays of content. MOET is in charge of instructing the first array of training content, and regularly updating the 3rd array of content. Departments

of Education and Training (provincial level) are in charge of instructing the 2nd array of training content.

Compensation for primary teachers according to regulations includes salary, coefficient of teacher's allowance, regional allowance. Regional allowance is applied to people working in remote and isolated areas with bad conditions. Elementary teachers receive preferential treatment and regional allowances, in particular: Urban areas (30%), rural areas (35%), mountainous areas and islands (50%).

In Vietnam, education has always been a cornerstone of national development, as the Vietnamese government reserves nearly 20 percent of public expenditures for education (OECD, 2011). However, in the era of globalization, there are concerns that the Vietnamese education system falls short to equip its population with necessary skills in a more competitive economy (Bodewig, Badiani-Magnusson, Macdonald, Newhouse, & Rutkowski, 2014). In the Socio-Economic Development Plan (SEDP) for 2011-2015, the government emphasizes that rapid development of a skilled workforce is essential for the modernization and development of a knowledge-based economy (General Assembly of the Socialist Republic of Vietnam [GAV], 2010).

In 2013, the Fundamental and Comprehensive Education Reform (FCER) was adopted, which aimed for national education to meet "the requirements of industrialization, modernization, and international integration in a socialist-oriented market economy" (Central Steering Committee [CSC], 2013). At its core, the FCER advocates for learning that focuses more on competency of learners rather than contents, in general education (grades K-12). It aims to improve students' cognitive and behavioral skills, critical and creative thinking, abilities to apply knowledge from multiple areas in problem solving, teamwork, and communication skills (CSC, 2013). However, the realization of such a reform depends almost exclusively on the preparedness of teachers to adopt the new pedagogical models. Indeed, one of the principles of the FCER stresses that teachers should be more professional and be ready to adapt to different, constantly changing contexts. Hence, teachers are considered the core of the reform process. Teacher training and support activities focus on greater interaction between professionals, reciprocity, hands-on mentorships, and coaching and on-time advice to teachers (World Bank [WB], 2016).

Despite positive results in education of Vietnamese teachers, there is a lack of high quality, responsive, and continuous onsite professional development for teachers. One of the biggest challenges is better coordination among all involving actors in teacher education to meet new demands. To address these challenges, the National Teacher Education Program (NTEP), conceived by the Ministry of Education and Training (MOET), has developed a comprehensive strategy for teacher education reform (Government Prime Minister [GPM], 2016). It is expected to facilitate necessary changes to meet training objectives in consideration of teachers' needs (WB, 2016).

Methodology and Method

To investigate job satisfaction of Vietnamese novice teachers in primary school, the authors conducted a survey in the academic year 2016-2017.

The study looks into 2 issues: at what level do some factors affect the decision to choose the teaching profession. The first (1 to 3) years working after graduating from universities/colleges, what are the factors that affect the teachers' professional satisfaction?

The research process consists of 2 phases: (i) preliminary research (brainstorming and pilot at several schools), (ii) research carried out in 7 provinces. The survey focused on two main issues: (i) reason for choosing teaching as a career include of 8 contents (see table 2): I am assured of a job, I only work half-day, with three/four holidays a year, I view teaching as a calling, teaching as a field of study, enjoyed working with children, a good opportunity to further my studies, an opportunity to do a second job additional to my teaching, a good salary; (ii) main factors that affect to the job satisfaction included of 12 contents (see table 4): Recognition, Personal growth, Responsibility, Pay, Administration, Superiors, Promotion, Work conditions, Colleagues, School leadership, School reputation, School infrastructure. These 12 contents are grouped under the three-domain model of teacher satisfaction. (Dinham & Scott, 2000) Extrinsic teacher dissatisfies, school-based factors neither highly satisfying nor dissatisfying and intrinsic satisfiers of teaching.

1.4. Samples and settings

The population for this study was novice teachers in public Vietnamese primary school (during the 2016-2017 academic year), with between one and three years of teaching experience.

Schools were selected randomly from seven provinces across the country, namely (1) northern midlands and mountainous area (Ha Giang province), (2) northern Central area (Nghe An province), (3) Red river delta area (Hai Phong province), (4) coastal province in south central region (Quang Nam province), (5) central highlands region (Gia Lai province), (6) south east region (Tay Ninh province) and (7) Mekong delta region (Can Tho province).

The authors used Yamane Taro's (1967) simplified formula for proportion, $n = N/(1+N*e^2)$, to determine the sample size. The population size (N) was 874 and the acceptable sampling error (e) was 0.05, corresponding to a confidence level of 95% and p = 0.5. The minimum sample size (n) should therefore be 274, which accounted for 36,61% of the 874 novice teachers in the seven provinces during the period of the study. Table 1 showed the number of novice teachers, with data collected from Department of Education and Training (2016).

Table 1. Samples data in 7 provinces

Location	Number of school	Number of teachers	Number of novice teachers *(2% of teachers)*
Ha Giang	228	6,485	130
Nghe An	465	11,440	229
Hai Phong	172	5,286	106
Quang Nam	230	5,663	113
Gia Lai	300	7,591	152
Tay Ninh	221	3,950	79
Can Tho	134	3,273	65
Total	**1,750**	**43,688**	**874**

**Source: Data collected from Department of Education and Training in 7 provinces of sampling*

The authors distributed questionnaires randomly to 320 participants. In general, 65.3% of Vietnamese people live in rural areas; only 34.7% live in township areas (of which 60.3% lives in inner-city locations). In particular, 74.02% of novice teachers from the seven provinces work in schools located in rural areas; hence a majority of the questionnaires were distributed to rural areas to ensure the sample set could well represent the population as a whole. School location was also classified into three categories: rural area, township area and inner-city area.

All 320 questionnaires were returned, giving a response rate 100%. Of the 320 novice teachers, 17.19% were male and 78.13% were female. 60.31% of the participants were from rural areas. Most participants were formally educated and fully trained: 30.94% had degrees in teaching, 28.95% had teaching certificates, 20% had both degrees and diplomas/certificates, and 3.13% had postgraduate qualifications.

1.5. Instruments and procedure

The questionnaires included general questions about the demographic of respondents and personal factors such as: place of birth, ethnic, teaching experience, highest teaching qualification, and school location. An informed consent was also included foremost in each questionnaire. Teachers were asked about their views on teaching as a career, in particular external environment issues such as reasons for choosing the profession, self-evaluations on teaching as a career in the country, personal and community perception of teaching, view of position in next 10 years. Furthermore, there were questions on factors that affect job satisfaction, performance, and career expectations. Finally, the authors included open-ended questions asking for suggestions to improve the quality of teaching in the country. Job satisfaction was measured using a Likert-type scale that includes strongly agree (4), agree (3), disagree (2), and strongly disagree (1).

1.6. Statistical methods

This is a descriptive study based on the survey method through questionnaires. Collected data were analyzed using the statistical package for the social sciences (SPSS) version 22.0. All data is analyzed through the following steps: Evaluate reliability and scale values using the

Cronbach's Alpha coefficient; (2) ANOVA is used to determine the difference in the mean of factors evaluated by different teachers in different locations. (Inner city, Rural and Township areas). Descriptive statistics such as mean, standard deviation (SD), percentages and frequency were used to determine the reasons for choosing teaching as a career, and to examine job satisfaction among novice teachers.

Result and Discussion

Reasons to choose teaching as a career

Table 2. Novice teachers' reasons to choose teaching

	Mean	S.D
With a teaching qualification I am assured of a job.	2.76	0.655
As a teacher I only work half-day, with four/three holidays a year.	1.92	0.707
I view teaching as a calling.	2.35	0.895
People (relatives/friends) recommended teaching as a field of study	3.03	0.673
I have always enjoyed working with children	3.42	0.537
Teaching provides a good opportunity to further my studies	3.45	0.571
Teaching gives me the opportunity to do a second job additional to my teaching.	2.17	0.709
Teaching provides a good salary.	2.07	0.631

Regarding reasons to choose teaching as a career (Table 2, Figure 2) (Cronbach's Alpha = 0.603) the majority of teachers chose *"teaching provides a good opportunity to further my studies"* (Mean = 3.45, SD = 0.571), followed by *"enjoying working with children"* (Mean = 3.42, SD = 0.537), and *"people (relatives/friends) recommended teaching as a field of study"* (Mean = 3.03, SD = 0.67). Most of the teachers chose this profession with the desire to continue their studies. Life-long studying is one characteristic of the teaching profession. Vietnam has a number of policies regarding periodic and unexpected professional training for the teachers. Training courses for the teachers are often held during the summer holiday. Many teachers continue their studies with post-graduate programs. The survey data show most of the teachers were formally educated and fully trained: 30.94% had degrees in teaching, 28.95% had teaching certificates, 20% had both degrees and diplomas/certificates, and 3.13% had postgraduate qualifications. On the other hand, relatively few teachers chose *"as a teacher I only work half-day, with three/four holidays a year"* (Mean = 1.92, SD = 0.707) and *"teaching provides a good salary"* (Mean = 2.07, SD=0.631) (Table 2). Primary education is set to be fully school day. Thus, primary teachers are aware that they would be working at schools all day. During summer breaks, teachers would be attending professional training courses. According to managing officers, 100% teachers attend in the training course every year. So, teachers choosing the teaching profession has well known to work not with half-day workdays or long holidays. These results suggested that a large number of teachers pursued teaching mainly out of passion and a sense of mission (with low standard deviations, ranging from 0.537 to 0.571).

Most novice teachers did not consider factors such as salary and payroll as too important (with standard deviations ranging from 0.631 to 0.707).

A number of studies report findings similar to ours, that a desire to work with children and adolescents is among the dominant reasons that draw individuals into a teaching career (Alexander, Chant, & Cox, 1994; Joseph & Green, 1986; Kyriacou & Coulthard, 2000; Moran et al., 2001; Richardson & Watt, 2006; Tudhope, 1944; Valentine, 1934). Similarly, according to an OECD report (OECD, 2005), common reasons for choosing teaching as a career are desires to work with children and adolescents, opportunities for intellectual fulfillment, and contributing to society. In contrast, some research findings in varied sociocultural settings such as Brunei (Yong, 1995), Zimbabwe (Chivore, 1988), Cameroon (Abangma, 1981), and Jamaica (Bastick, 1999), have showed that extrinsic motives such as salary, job security, and career status dominate. It seems evident that sociocultural settings form and shape motivations for career choice, satisfaction and persistence.

For the final question of whether they would reconsider their career, fifty-two teachers, constituting 16.25% of the sample set, wanted to change career (Table 3). Although 16.25% is a relatively small percentage, and this research did not pursue the matter further, we note that it might be worthwhile to investigate the main reasons behind the wish to change career by these teachers.

Table 3. Would you choose the teaching profession again?

	Frequency	Percent
Yes	267	83.44
No	52	16.25
Missing	1	0.31
	320	**100.00**

Factors affect novice teachers' job satisfaction

Using factor analysis, existing literature has identified several variables affecting job satisfaction of teachers, namely recognition, responsibility, pay, administration, superiors, promotion, work conditions, colleagues, school leadership, school reputation and school infrastructure. Our research provided empirical data that demonstrates the significance of each factors (Table 4). These factors affect the satisfaction of the novice teachers and are analyzed accordingly to the three-domain model of teacher satisfaction.

Table 4. Factors evaluated by novice teachers

	Mean	S.D
Recognition		
My community will always see teaching as a low status job	1.57	0.602
Teaching is a threat to the culture of my community.	1.27	0.525
My community holds teaching in high regard.	3.37	0.551
Parents value me as a teacher.	3.26	0.788
Society has a high regard for teachers.	3.25	0.799
Personal growth		
Insufficient number of in-service training opportunities	2.42	0.973
Low prospects of securing study leave to pursue further studies/training	2.90	0.904
Responsibility		
Too much work	2.81	0.755
The classes at my school are overcrowded	2.70	0.686
Pay		
Insufficient salary	2.40	0.911
Administration		
Administration staffs at the school are competent.	3.14	0.575
Superiors		
Conflict with educational authorities	2.68	1.130
Conflict with school management	2.64	1.077
Management at my school is not supportive.	1.79	0.570
I believe that my head of department is competent.	3.53	0.506
Promotion		
Low prospects for promotion	3.12	0.831
Work conditions		
My classroom is sufficient for teaching and learning.	3.05	0.683
There are sufficient resources (e.g. books) at my school to assist me in teaching.	3.09	0.622
My school provides an effective environment for teaching and learning that contributes to my professional status.	3.33	0.490
Colleagues		
Lack of communication with other teachers	2.72	0.995
Conflict with colleague(s)	2.66	1.115
School leadership		
I respect my principal.	3.68	0.495
My principal values and supports my professional development	3.41	0.559
Principals are often appointed because they know the right people and not because of their competence.	1.91	0.583
School reputation		
I feel proud to be a teacher at my school.	3.44	0.516
School infrastructure		
Poor quality of general social infrastructure (classroom, lighting, tools, etc.	2.54	0.952
Poor quality of Information and Communication Technology (ICT)	2.64	0.794

a) Extrinsic teacher dissatisfies

Regarding **personal growth**, our data suggested that novice teachers could benefit from having more leave days to pursue further studies or training. For primary school teachers specifically, leave days are still a luxury, since one teacher is responsible for too many classes - the number of teachers per class ranges from 1.2 to 1.5, according to the Vietnam's Educational Law.

Zeytinoglu et al. (2007) finds that low job satisfaction, abilities, and heavy work are connected. Our data showed that novice teachers have to take on too much **responsibility**. This may have resulted from a change introduced by the Ministry of Education and Training, in which all elementary schools switched from half-day to full-day programs, and one teacher has to take care of all subjects, except physical education and special subjects.

Novice teachers are expected to have lower pay rates than their more experienced colleagues, which might threaten their work commitment and quality of work, as shown by Smith (1992), Okpara (2004), and Liu et.al, (2000). The results in this study seem to indicate that there are as many novice teachers who think their **pay** is too low as there are teachers who think otherwise. This difference in opinions might be attributed to the regions the teachers come from (see Figure 3).

b) 3.2.2. School-based factors neither highly satisfying nor dissatisfying

School-based factors such as superiors, leadership, reputation and infrastructure were also investigated.

Although a number of novice teachers experienced conflicts with their **superiors**, they are in general satisfied with their head of department and consider management supportive. Conflicts might result from miscommunication and misunderstanding due to the teachers being new in their career. Maghradi (1999) notes that employees with greater satisfaction with supervisors have greater working experience.

Novice teachers were quite satisfied with **school leadership** in overall. Although the majority of surveyed schools are in rural areas, the results showed a high degree of satisfaction on **school reputation**. **School infrastructure** were also an important factor, as increasing investment in technology likely improves job satisfaction in employees (Attar and Sweiss, 2010). Our data showed that the infrastructure generally was poor and still obstacle to novice teachers.

c) Intrinsic satisfiers of teaching

On **recognition**, our data showed that certain perceptions were unpopular, namely *"teaching is a threat to the culture of my community"* and *"my community will always see teaching as a low status job"*, with means of 1.27 and 1.57. On the other hand, most novice teachers agreed that *"teaching is highly regarded in the community",* with a mean of 3.37. These results suggested a bright future for the interviewed teachers in their respective communities. In Vietnam, teaching profession is always respected. Prime Minister Pham Van Dong said: "Teaching is the most noble among the noble professions". Teaching has always been respected by many. The National Teachers' Day isn't just about the Educational system and its learners paying respect towards the teachers but also for the society to show appreciation towards people in the teaching profession – the most noble profession of all. Weiss (1999) found that for first

year teachers, positive perceptions of workplace conditions predict a stronger commitment to teaching.

Nias (1996), Shan (1998), and Dinham and Scott (1998) point out that the possibility of promotion is a factor contributing to teachers' job satisfaction. According to our data, **promotion** opportunities for Vietnamese novice teachers were low, likely due to established bureaucratic processes in assessment for promotion, which require years of teaching experience. However, primary teachers always strive for better professional skills, to assert themselves in the community by scholarly academics. When choosing the teaching profession, they always want to further their studies when practicing their profession (see table 2).

In general, the interviewed novice teachers showed satisfaction on working conditions for teaching and learning. Survey data show that the majority of primary school teachers choose the profession and because of various reasons. Although working conditions are not perfect, they are still satisfied with working conditions

Our data suggested that novice teachers had some trouble communicating with **colleagues**. New teachers might hesitate in communicating with experienced teachers. In Vietnam, primary school teachers engage in professional team work only once per month, which, together with few opportunities for class observation, offer limited chances for interacting with colleagues.

Figure 3. Comparison across different areas

Figure 3 breaks down the survey results in different school settings: inner city, rural and township areas. The results indicated that novice teachers in inner city and rural areas care more about salary compared to those in township areas. A very similar dichotomy is seen regarding prospective for promotion, about which teachers in inner city and rural areas share approximately the same level of concern, which is higher compared to the level of concern shown by teachers in township areas. For rural and township areas, the most concerning issue was promotion, while for inner city areas, relationships with colleagues and opportunities to pursue further studies were more important.

Table 5. Comparison across different areas

		Sum of Squares	df	Mean Square	F	Sig.
Insufficient salary	Between Groups	6.482	2	3.241	3.978	0.020
	Within Groups	255.833	314	.815		
	Total	262.315	316			
Too much work	Between Groups	5.018	2	2.509	4.495	0.012
	Within Groups	174.169	312	.558		
	Total	179.187	314			
Insufficient number of in-service training opportunities	Between Groups	5.940	2	2.970	3.180	0.043
	Within Groups	290.408	311	.934		
	Total	296.347	313			
Poor discipline	Between Groups	.940	2	.470	0.613	0.543
	Within Groups	241.679	315	.767		
	Total	242.619	317			
Low prospects for promotion	Between Groups	6.948	2	3.474	5.167	0.006
	Within Groups	206.394	307	.672		
	Total	213.342	309			
Conflict with school management	Between Groups	14.686	2	7.343	6.555	0.002
	Within Groups	349.492	312	1.120		
	Total	364.178	314			
Lack of guidance and counseling	Between Groups	8.009	2	4.005	6.460	0.002
	Within Groups	195.884	316	.620		
	Total	203.893	318			
Low prospects of securing study leave to pursue further studies/training	Between Groups	5.788	2	2.894	3.604	0.028
	Within Groups	248.941	310	.803		
	Total	254.728	312			
Conflict with colleague(s)	Between Groups	11.553	2	5.776	4.760	0.009
	Within Groups	379.849	313	1.214		
	Total	391,402	315			

Table 5 shows that the majority of these factors differ between Inner City, Rural and Township, there are only 2 factors "Insufficient number of in-service training opportunities" and "Lack of communication with other teachers" have Sig <= 0.05, this indicates that these two factors are not eligible for continuing ANOVA and cannot confirm the difference between regions. This shows that there is a similarity in average values among teachers across regions. The remaining factors are eligible for ANOVA. In the remaining factors there's "Poor quality of Information and Communication Technology (ICT)" with Sig = 0.140 > 0.05, so there is no difference in teachers' opinion from different regions. Other factors all have Sig < 0.05 that indicates that there is a clear difference in the opinions among teachers from different regions. For most of these factors, teachers from Inner city are more concerned than the teachers from rural areas and townships.

Overall novice teachers although had experienced less satisfaction in personal growth, responsibility, promotion, colleagues and school infrastructure, relatively high levels of satisfaction were discovered in several other factors, namely recognition, administration, superiors, work conditions, school reputation, school leadership. Since our study presented only quantitative data, a qualitative study would be recommended to further understand the variables that make novice teachers less satisfied. Nevertheless, novice teachers were also asked about

how they see their career in the next 10 years, the results indicated that the majority of teachers hope to stay in teaching, but in a higher position (Figure 4). A small percentage (4.06%) of teachers see themselves leaving the profession.

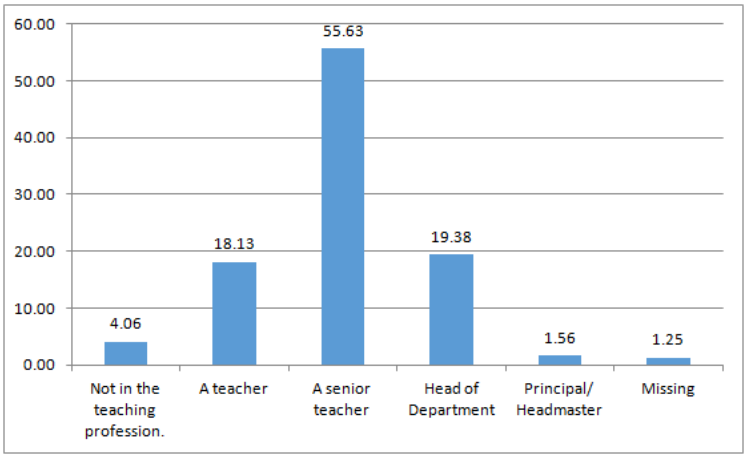


Figure 4. Question on seeing yourself in ten years' time

Conclusion

The early years of teaching are vital in shaping professional competency of teachers, as well as shaping an entire educational system. An educational system may experience unexpected impact when novice teachers face too many issues and challenges in their early stage of profession development. The literature suggests that examining how teachers perceive their job conditions holds promise for understanding the reasons behind teacher turnover.

Our research findings showed that the two most dominant reasons for choosing teaching as a career among novice teachers in seven provinces were enjoying working with children and opportunities for further studies. Although teaching is not a well-paid job in Vietnam compared to other professions, the survey results showed that salary is not a deciding factor for teachers in choosing their career, agreeing with several previous works such as Alexander et al. (1994); Joseph & Green (1986); Kyriacou & Coulthard, (2000); Moran et al., (2001); Richardson & Watt (2006); Tudhope (1944); and Valentine (1934). Interestingly, the study showed that most novice teachers would stick with teaching if they were to choose their profession again.

Regarding job satisfaction, the results presented in this paper exhibited all factors found in the existing literature. In particular, novice teachers have experienced less satisfaction in personal growth, responsibility, promotion, colleagues and school infrastructure. Nevertheless, relatively high levels of satisfaction are found in several other factors, namely recognition, administration, superiors, work conditions, school reputation, school leadership. Novice teachers who experience high levels of job satisfaction are more motivated, committed and determined to remain in the profession despite high job demands (Tait, 2008), leading to enhanced teacher productivity and improved educational outcomes (Moè et al., 2010). Several studies have concluded that job satisfaction has positive consequences for the individual and the school (Corbell et al., 2010; Høigaard et al., 2012; Malinen and Savolainen, 2016). In fact, the majority of novice teachers felt proud to teach at their school.

Major concerns of novice teachers varied geographically. Compared to teachers in inner city and rural areas, those in township areas concern less about salary. For rural and township areas, the dominant concern was job promotion, while for inner city areas, relationship with colleagues and opportunities to pursue further studies were more important. This result is also the premise for further research on career development opportunities for novice teachers in different primary schools in different regions.

The results of this research indicate some of the remaining issues, which the basis for recommendations for policy-makers are regarding teachers' satisfaction as:

(i) the Government should reform the salary policies for primary teachers,
(ii) MOET should issue guidelines to improve the opportunities for novice teachers to be trained professionally;
(iii) Agencies in charge should focus on investing in the infrastructure for classrooms, lab and teaching equipment; (iv) and to invest in ICT infrastructure.

Being a developing country, Vietnam has always been striving for educational reforms. One of the key solutions is to enhance teacher competency, which reform programs aim to achieve. For these programs to be effective, they need to develop a deep understanding of why teachers choose their career, as well as of how their job satisfaction is affected by the stress and challenges they often encounter during their early years of teaching. Towards this goal, the current paper provided empirical observations that can inform policymakers and curriculum developers of problematic areas. In particular, it is the authors' hope that these findings will lead to intervention measures that aim to improve work commitment and reduce turnover, through improving the working environment and support for novice teachers. A qualitative research is also recommended to further study the issues.

Acknowledgment

This work was supported by the Vietnam National University, Hanoi research fund [grant number QG.16.85].

References

Abangma, M. A. (1981). *A study of primary teachers' attitudes towards realization of school curriculum in English speaking Cameroon*. Unpublished doctoral dissertation. UK: University of London.

Alexander, D., Chant, D., & Cox, B. (1994). What motivates people to become teachers. *Australian Journal of Teacher Education, 19*(2), 40-49

Attar, G., & Sweiss, R., (2010). The relationship between information technology adoption and job satisfaction in contracting companies in Jordan. *Journal of Information Technology in Construction, 15*, 44-63.

Authors (2018). [details removed for peer review]

Barber, M., & Mourshed, M. (2007). *How the World's Best Performing School Systems come out on Top*. London: McKinsey and Company

Bastick, T. (1999). A motivation model describing the career choice of teacher trainees in Jamaica. Paper presented at the Biennial Conference of the International Study Association on Teachers and Teaching, Dublin, Ireland.

Bodewig, C., Badiani-Magnusson, R., Macdonald, K., Newhouse, D., & Rutkowski, J. (2014). *Skilling up Vietnam: preparing the workforce for a modern market economy (English). Directions in development; human development.* Washington, DC: World Bank Group.

Brookhart, S. M. & Freeman, D.J. (1992). Characteristics of Entering Teacher Candidates. *Review of Educational Research, 62*(1), 37-60.

Central Steering Committee (2013). *Resolution on Fundamental and comprehensive innovation in education, serving industrialization and modernization in a socialist-oriented market economy during international integration" ratified in the 8th session* (No 29/NQ-TW). Hanoi, Vietnam: CSC.

Chaaban, Y., & Du, X. (2017). Novice teachers' job satisfaction and coping strategies: Overcoming contextual challenges at Qatari government schools. *Teaching and Teacher Education, 67*(2017), 340-350.

Chivore, B. S. R. (1988). A review of factors that determine the attractiveness of teaching profession in Zimbabwe. *International Review of Education, 34*(1), 59-77

Clotfelter, C. T., Ladd, H. F., & Vigdor, J. (2005). Who teaches whom? Race and the distribution of novice teachers. *Economics of Education Review, 24*(4), 377-392.

Collie, R. J., Shapka, J. D., & Perry, N. E. (2012). School climate and social–emotional learning: Predicting teacher stress, job satisfaction, and teaching efficacy. *Journal of Educational Psychology, 104*(4), 1189-1204.

Corbell, K. A., Osborne, J., & Reiman, A. J. (2010). Supporting and retaining beginning teachers: A validity study of the perceptions of success inventory for beginning teachers. *Educational Research and Evaluation*, *16*(1), 75-96.

Czubaj, C. A. (1996). Maintaining teacher motivation. *Education*, *116*(3), 372–378.
Desimone, L. (2009). Improving impact studies of teachers' professional development: Toward better conceptualizations and measures. *Educational Researcher*, *38*(3), 181–199.

Dinham, S., & Scott, C. (2000). Moving into the third, outer domain of teacher satisfaction. *Journal of Educational Administration*, *38*(4), 379-396.

Dinham, S., & Scott, C. (1997). Modelling teacher satisfaction: Findings from 892 teaching staff at 71 schools. Paper presented at the American Educational Research Association Annual Meeting, Chicago, IL.

Dinham, S., & Scott, C. (1998). A three domain model of teacher and school executive career satisfaction. *Journal of Educational Administration*, *36*(4), 362-378.

Đinh, T. H. V. et al (2017). Primary teacher's acknowledge of the role of attitudes toward students**.** *Educational Science Journal*, S.04.

Duong, M.Q. (2013). The effects of Demographic and Intuitional Characteristics on job satisfaction of University Faculty in Vietnam. *International Journal of Academic Research in Progressive Education and Development*, *2*(4), 78-92.

Fantilli, R.D. and McDougall, D.E. (2009). A study of novice teachers: challenges and supports in the first years. *Teaching and Teacher Education*, *25*(6), 814-825.

General Assembly of the Socialist Republic of Vietnam. (2011). *Decision on the Five-year Socio-Economic Development Plan 2011-2015*. Hanoi, Vietnam: GA.

Gottfredson, L. S. (1981). Circumscription and compromise: A developmental theory of occupational aspirations. *Journal of Counseling Psychology (Monograph)*, *28* (6), 545-579.

Government Prime Minister. (2016). *Decision on Training teachers and educational manager proposal, in demand of fundamental and comprehensive innovation in education period 2016-2020, orientations to 2025*(No 732/QĐ-TTg). Hanoi, Vietnam: GPM.

Grion, V., & Varisco B. M. (2007). On Line Collaboration for Building a Teacher Professional Identity. *Psychology Journal*, *5*(3), 271-284

Hayes, S. (1990). *Students' Reasons for Entering the Educational Profession*. Research Report, Oklahoma: North-western Oklahoma State University.

Herzberg, F., Mausner, B., & Snyderman, B. B. (1959). *The motivation to work*. Piscataway, New Jork: Transaction Publishers.

Høigaard, R., Giske, R., & Sundsli, K. (2012). Newly qualified teachers' work engagement and teacher efficacy influences on job satisfaction, burnout, and the intention to quit. *European Journal of Teacher Education*, *35*(3), 347-357.

Johnson, S. M. (2004). *Finders and keepers: Helping new teachers survive and thrive in our schools*. Indianapolis, IN: Jossey-Bass.

Joseph, P. B., & Green, N. (1986). Perspectives on reasons for becoming teachers. *Journal of Teacher Education*, *37*(6), 28-33.

Kardos, S., & Moore Johnson, S. (2007). On their own and presumed expert: New teachers' experience with their colleagues. *Teacher College Record*, *109*(9), 2083-2106.

Kyriacou, C., & Coulthard, M. (2000). Undergraduates' views of teaching as a career choice. *Journal of Education for Teaching: International Research and Pedagogy*, *26*, 117-126.

Kyriacou, C., Hultren, A., & Stephens, P. (1999). Student teachers' motivation to become a secondary school teacher in England and Norway. *Teacher Development*, *3*, 373-381.

Lam, B. H., & Yan, H. F. (2011). Beginning teachers' job satisfaction: The impact of school-based factors. *Teacher Development*, *15*(3), 333-348.

Liu, E., Kardos, S. M., Kauffman, D., Preske, H. G., & Johnson, S. M. (2000*). Barely breaking even: Incentives, rewards, and the high costs of choosing to teach*. Cambridge: Harvard Graduate School of Education.

Liu, S., & Onwuegbuzie, A. J. (2014). Teachers' motivation for entering the teaching profession and their job satisfaction: a cross-cultural comparison of China and other countries. *Learning Environments Research*, *17*(1), 75-94.

Locke, E. A. (1976). The nature and causes of job satisfaction. In M. D. Dunnette (Ed.), *Handbook of industrial and organizational psychology* (pp. 1297-1349). Chicago, IL: Rand McNally.

Lomas, T., Medina, J. C., Ivtzan, I., Rupprecht, S., & Eiroa-Orosa, F. J. (2017). The impact of mindfulness on the wellbeing and performance of educators: A systematic review of the empirical literature. *Teaching and Teacher Education*, *61*(2017), 132-141.

Maghradi, A. (1999). Assessing the effect of job satisfaction on managers. *International Journal of Value-Based Management*, *12*, 1-12.

Malinen, O. P., & Savolainen, H. (2016). The effect of perceived school climate and teacher efficacy in behavior management on job satisfaction and burnout: A longitudinal study. *Teaching and Teacher Education, 60*, 144-152.

Mansfield, C. F., Beltman, S., Broadley, T., & Weatherby-Fell, N. (2016). Building resilience in teacher education: An evidenced informed framework. *Teaching and Teacher Education*, *54* (2016), 77-87.

Maslow, A. (1943). A theory of human motivation. Psych*ological Review*, *50*, 370-396.
Ministry of Education and Training (2011). *No 32/2011/TT- BGDĐT*

Moè, A., Pazzaglia, F., & Ronconi, L. (2010). When being able is not enough. The combined value of positive affect and self-efficacy for job satisfaction in teaching. *Teaching and Teacher Education*, *26*(5), 1145-1153.

Moore, C. M. (2012). The role of school environment in teacher dissatisfaction among US public school teachers. *SAGE Open*, *2*, 1-16.

Moran, A., Kilpatrick, R., Abbott, L., Dallat, J. & McClune, B. (2001). Training to teach: motivating factors and implications for recruitment. *Evaluation and Research in Education, 15*(1), 17-32.

Nias, J. (1996). Thinking about feeling: the emotions in teaching. *Cambridge Journal of Education*, *26*(3), 293-306.

Nguyen, T. K. D. (2010) Modern school and requirements for future teachers. *Educational journal*. Special issue 6.2010, Pg 20-22

OECD [Organization for Economic Cooperation and Development] (2005). *Teachers matter: Attracting, developing and retaining effective teachers*.

OECD [Organization for Economic Cooperation and Development] (2011). *Education at a Glance 2011: OECD Indicators*.

Okpara, J. (2004). The Impact of Salary on Job Satisfaction. *The Journal of Business in developing nations*, *8*(2004), 65-91.

Pepe, A. & Addimando, L., & Veronese, G. (2017). Measuring Teacher Job Satisfaction: Assessing invariance in the teacher job satisfaction scale (TJSS) Across six countries. *Europe's Journal of Psychology*, *13*(3), 396-416.

Pham, H. Q. (2009) Capacity-oriented Teacher training. *Educational journal*. 6.2009.

Ramsay, G. (2000). Quality matters. Revitalizing teaching: Critical times, critical choices. Report of the review of teacher education. Sydney, Australia: NSW Department of Education and Training.

Rhodes, C., Nevill, A., & Allan, J. (2004). Valuing and supporting teachers: A survey of teacher satisfaction, dissatisfaction, morale and retention in an English local education authority. *Research in Education*, *71*(1), 67-80.

Richardson, P. W., & Watt, H. M. G. (2006). Who chooses teaching and why? Profiling characteristics and motivations across three Australian universities. *Asia-Pacific Journal of Teacher Education*, *34*(1), 27-56

Sergiovanni, T. (1967). Factors which affect satisfaction and dissatisfaction of teachers. *Journal of Educational Administration*, *5*(1), 66-82.

Shann, M. H. (1998). Professional commitment and satisfaction among teachers in urban middle schools. *The Journal of Educational Research*, *92*(2), 67-73.

Sinclair, C. (2008). Initial and changing student teacher motivation and commitment to teaching. *Asia-Pacific Journal of Teacher Education*, 36(2), 79-104.

Skaalvik, E. M., & Skaalvik, S. (2010). Teacher self-efficacy and teacher burnout: A study of relations. *Teaching and Teacher Education, 26*(4), 1059-1069.

Skaalvik, E. M., & Skaalvik, S. (2011). Teacher job satisfaction and motivation to leave the teaching profession: Relations with school context, feeling of belonging, and emotional exhaustion. *Teaching and Teacher Education, 27*(6), 1029-1038.

Skaalvik, E. M., & Skaalvik, S. (2015). Job satisfaction, stress and coping strategies in the teaching profession - what do teachers say? *International Education Studies, 8*(3), 181-192

Smith, P.C. (1992). In Pursuit of Happiness: Why Study General Job Satisfaction?. In C.J Cranny, P.C. Smith & E. F. Stone (Eds.), *Job Satisfaction* (pp.5-19). New York: Lexington Books.

Stiegelbauer, S. (1992). Why We Want to Be Teachers: New teachers talk about their reasons for entering the profession. Paper presented at the Annual Meeting of the American Educational Research Association, San Francisco, April 20-24, 1992.

Super, D. E. (1953). A theory of vocational development. *American Psychologist, 8*, 185-190.

Tait, M. (2008). Resilience as a contributor to novice teacher success, commitment, and retention. *Teacher Education Quarterly, 35*(4), 57-75.

Tran, V. D., & Le, M. T. L. (2015). School environment factors as predictors for teacher's teaching efficacy, teacher stress and job satisfaction. *International Education Research, 3*(2), 28-46.

Tran, B. H. (2006) Teacher issue- Theoretical and Practical studies. *The Pedagogical Publishing Hourse.*

Tran, T. T.,Le. T. H. T., (2017) Training the teachers and requesting for interest in the experience and characteristics of the teaching environment, *International reviews Journal*, Vol 33, No 5 (2017) Pg 131-144.

Tudhope, W. B. (1944). Motives for choice of the teaching profession by training college students. *British Journal of Educational Psychology, 14*, 129-141

Valentine, C. W. (1934). An enquiry as to reasons for the choice of the teaching profession by university students. *British Journal of Educational Psychology, 4*, 237-259.

Vietnam National Assembly (2009). *Education Law 44/2009/QH/12.*

Vietnam Ministerial. (2016). The education levels and training levels of the national education system. *Decision 1981/QD-TTg*.

Vietnam Ministerial (2016). The Vietnamese qualification framework. *Decision 1982/QD-TTg*.

Vietnam Government (2004). Regarding segime for governnance staff officials and armed force. *No. 204/2004 / ND-CP*.

Vroom, V. H. (1964). *Work and Motivation*. New York: John Wiley.

Watt, H. M.G., Richardson, P. W., Klusmann, U., Kunter, M., Beyer, B., Trautwein, U., & Baumert, J. (2012). Motivations for choosing teaching as a career: An international comparison using the FIT-Choice scale. *Teaching and Teacher Education, 28*(2012), 791-805.

Wei, R. C., Andree, A., & Darling-Hammond, L. (2009). How nations invest in teachers. *Educational Leadership, 66*(5), 28-33.

Weiss, E. (1999). Perceived workplace conditions and first-year teachers' morale, career choice commitment, and planned retention: A secondary analysis. *Teaching and Teacher Education, 15*, 861–879.

World Bank (2016). *International Development Association Program Appraisal Document on a proposed credit in the amount of SDR 67.8 million to the Socialist Republic of Vietnam for the enhancing teacher education program, program-for-resul*ts.

Yamane, T. (1967). *Statistics: An Introductory Analysis, 2nd Edition*. New York: Harper and Row

Yong, B. C. S. (1995). Teacher trainees' motives for entering into a teaching career in Brunei Darussalam. *Teaching and Teacher Education, 11*(3), 275-280.

Yoon, K. S., Duncan, T, Lee, S. W. Y., Scarloss, B., & Shapley, K. (2007). *Reviewing the evidence on how teacher professional development affects student achievement*. Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Educational Laboratory Southwest.

Zeytinoglu, I.U., Denton, M., Davies, S., Baumann, A., Blythe, J., & Boos, L. (2007). Deteriorated external work environment, heavy workload and nurses: Job satisfaction and turnover intention. *Canadian Public Policy, 33*, 31-47.

Nuancing Pedagogic Practice in Virtual Learning Environments (VLE): Cases of Student Performativities and Fabrications

Jose Aims R. Rocina, PhD

and

Edwin F. Lineses, PhD Cand.

Social Sciences Department
De la Salle University-Dasmarinas
jrrocina@dlsud.edu.ph/ eflineses@dlsud.edu.ph

ABSTRACT

The advent of technology and digital connectivities brought significant changes to social relations and cultural activities. These changes permeate and mediate the learning settings and educational systems. Virtual Learning Environment (VLE), as an arena for knowledge production and acquisition, merits close consideration using simple techniques of ethnography to recognize the nuances of Bernstein's Pedagogic Practice. The paper utilizes cases of informants who have experienced Blended/Flipped courses. Grounded on Ball's performativities and fabrications, the study seeks to describe the pedagogic practice primarily from the vantage points of the students and how they behave in pursuit of their educational interests in a new learning environment. Consequently, the paper argues that VLE provides a wider latitude for students to assert their agency in this emerging pedagogic relation.

Keywords: VLE/LMS, Blended/Flipped Learning, Performance, Pedagogic Practice, Education

Introduction

> *"Online education courses enable students any time and from anywhere to log on and move through menued choices at their own pace and leisure. Wired or wireless—our everyday routines, social relations, cultural activities, and frames of reference have been irrevocably changed by digital technologies and global connectivity"*
>
> -Luke, 2006

The advent of technology has brought significant impact on the lives of the modern society. Digital connectivities have changed every day routines, social relations, and cultural activities (Luke, 2006). The notions of disconnectivity underpin the organization of all aspects of human life ranging from the biological to the social, to the economic and technological as well as to the foundations of the networked space in education (Selwyn in Apple, et al., 2010).

As internet and computers became pervasive in our lives, we become more aware of how these tools mediate learning settings. They are now increasingly used as a learning space specifically for higher education (Bayne, 2008; Franetovic, 2011; Weller, 2007)

The Virtual Learning Environment (VLE) is a platform to create and deliver content, monitor student participation, and assess student performance (Weiss, 2006; Weller, 2007). Modern technology, with internet and computers, "helps to create, and is also the site for virtual learning." It is a learning environment "mediated by computers and digital technologies" (Weiss, 2006).

As a learning space, VLE has a crucial role in educational processes (Bernstein in Ball, 2003). It is a site in which the "space is deeply implicated in power, production, and social relations" (Robertson in Apple, et al., 2010). To Foucault as cited by Dussel (in Apple et al., 2010); power has been a constant theme in all social interactions. To him, it is not considered as a substance but as a relation and hence no single power can be located at a given place or time. A relationship is manifested from the inside and from the outside; it is embodied and enacted in our bodies through our discourses-- in what we do, and how we respond to people, structure, and circumstances.

The notion of power permeates the pedagogic practice in a pedagogic relation consisting of the transmitters and acquirers. The pedagogic practice is a social form and a specific content. It is understood as a cultural relay for both the reproduction and the production of culture. It pertains to the issues of what is relayed, the contents, and how the contents are relayed or the "*what* and *how"* of any transmission (Bernstein, 2001).

Embodied in the body, power is evident in the *performativities* and *fabrications* of the actors, transmitters and acquirers, in a pedagogic relation. Their performativities and fabrications are manifestations of the "discourses of power, of resistances and accommodations" to them (Ball, 2001). Performativity is a technology, a culture, and a mode of regulation…that employs judgments, comparisons and displays as means of control, attrition, and change. It is the creation of social identities and articulation of the self 'within representation games of

competition' as enactment or performance. Fabrication on the other hand, is the practice of self-management as a form of, response to, and accommodation of performativity (Ball, 2001). Though not necessarily comparable to others, Dussel (2010), argues along with Foucault that we all have some kind of these powers.

Focus of the Study

The study focuses on how power in a pedagogic practice as cultural relay permeates the new learning space or the VLE. It attempts to describe the "*what* and *how"* of transmission/acquisition from the vantage points of the actors, primarily of the students. Consequently, the paper looks into the nuances of student performativity and fabrication of their interests in the new learning environment. In the end, the paper argues that VLE provides a wider latitude for students to assert their agency in this new pedagogic relation.

Limitation of the Study

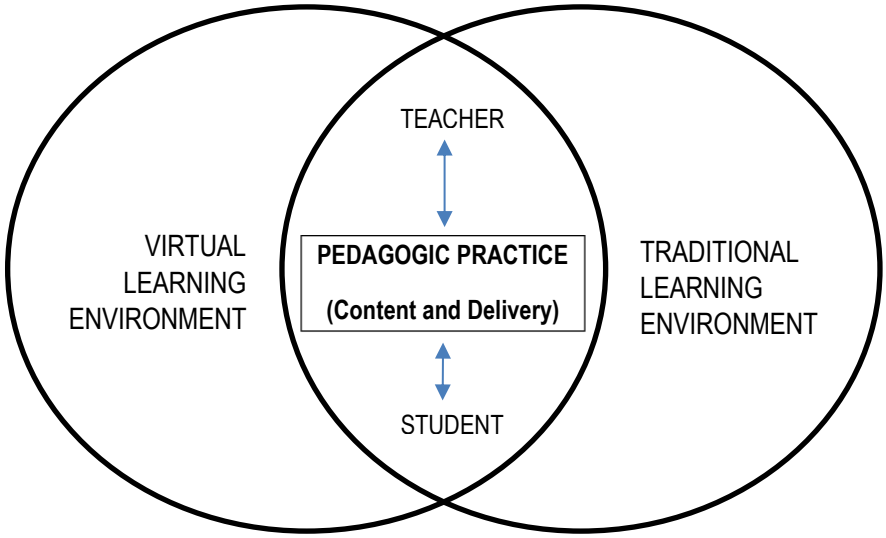
The study puts premium on the cases of student (than teacher) performativities and fabrications for only a short period. It covers only one college, the College of Liberal Arts and Communication (CLAC) of De la Salle University-Dasmarinas; with 5 informants from 3 programs namely: Communication Arts, Political Science, and Development Studies. Moreover, the study uses convenience and purposive sampling in the selection of informants.

Framework of the Study

The Figure 1 shows how the actors, transmitter (teacher) and the acquirer (student), engage in a pedagogic practice. The teacher and the student play their roles in both sites of learning, i.e. virtual or traditional learning environment. The figure also demonstrates how both actors exercise their powers to perform and fabricate their own interests through the pedagogic practice of cultural relay.

Conceptual Framework

Performativities and Fabrications of Pedagogic Practice in VLE



*Relational arrows indicate directions of the exercise of power: performativities and fabrications (Dussel in Apple, 2010)

Figure 1. Conceptual Framework

Method of the Study

The Platform

The DLSU-D Learning Management System (LMS) , known as the Schoolbook (SB), is the official VLE platform. “a beautiful, modern, and easy-to-use Learning Management System (LMS) makes it simple to deliver online education.” It involves “creating and configuring a class, adding lessons and assignments, grading assignments, enrolling students… to deliver an engaging, collaborative, and effective online learning environment” (Schoolbook User Guide for Teachers, 2014).

Sample Selection

The informants of the study were 5 students of 3 academic programs from the College of Liberal Arts and Communication (CLAC). They were purposely chosen as they had experienced using SB as Blended/Flipped Course. Blended sessions mean half of the time is spent online (VLE) and the other half is spent on-site (classroom). They are pre-selected students whom we believe can generate adequate data for the study.

The Techniques

The study used simple techniques of ethnography to derive interpretive results from the data generated by the informants. Casual and guided interviews were complemented by simple participant observations, as the authors have also handled blended courses in the university. The data then were organized and categorized into smaller numbers of themes and patterns of relationships to address the questions purported in the study.

Results of the Study

In a certain category, the findings reveal the *Nuances of Practice* and the *Nuances of Power*. The nuances of practice are derived from Bernstein's Pedagogic Practice as to the "*what* and the *how"* of knowledge production, transmission, or acquisition. On the other hand, the nuances of power demonstrate the performativities and fabrications of students in a pedagogic relation in a new learning environment.

NUANCES OF PRACTICE

(Pedagogic Practice in the What and How of Knowledge Acquisition)

For the content of knowledge acquisition in VLE, the study suggests that students learn something on the formal course inasmuch as they also have in non-course learnings.

Content: the What of Knowledge Acquisition

Most informants indicate that learning also takes place in VLE though not as much as in traditional learning environment. When asked about what they learn through VLE, all of them revealed that they have acquired the knowledge and competencies of the courses but at varying levels of mastery.

Apart from the course content, all informants agreed that they needed to be adept in the use of new technologies and applications that would help them to operate and function effectively in a VLE. In addition, students need to develop communication skills appropriate to VLE, i.e. being able to read between the lines and exercising sensitivity to the message embedded in the texts. These skills are what Bernstein (2001) refer to as 'prerequisite of pedagogic relation'.

Delivery: the How of Knowledge Acquisition

The delivery of the content is discussed from the vantage points of the transmitters and the acquirers.

From the Transmitters

The contents of the lessons in VLE are delivered differently than in a traditional learning environment. Both the teachers (Also interviewed were 2 instructors and likewise, incorporated the researchers' experience in handling Blended Courses) and the students indicate common ways to deliver the content in a virtual environment.

Teachers deliver lessons through the posting of power point presentations in the *lessons tab* of every virtual class. Few teachers post a video of themselves delivering a recorded lesson. Activities and quizzes are also given through the *assessments tab;* to augment the presentations and to ensure the mastery of the material. At times, teachers inform students of the expectations or instructions through the *news tab*. Moreover, when teachers opt for synchronous discussions (simultaneous), the *chat tab* is also used to create threads of conversations in real time. Teachers also monitor the presence of the students in onsite and online classes through the *attendance tab*; making SB as a built-in class record for students to individually track their academic performance.

The platform tabs are the avenues for the teachers to manifest their power and control over their students with how the contents are delivered through these virtual learning tabs.

From the Acquirers

On the other hand, students suggest how they learn through VLE in the following discourses:

Based on the foregoing discourses, it is evident in VLE that when the students want to optimize their learning; they need to learn distinctly from how the teachers assume knowledge should be relayed. The students contended that they learn all by and through themselves and not necessarily through the materials that teachers provide. They can only learn when they have the initiative to know the materials provided and the extent of what they learn hinges on their efforts to go beyond what teachers give.

Admittedly, while students did not learn much from the power point presentations posted in the lessons tab; they nevertheless, got something from them. Students learned the outline or the lessons in the presentation and get to master the concepts through formative assessments (quizzes or activities). Students learned a little through the passive one-way presentations. These (Rocina, 2017) reflect that they are still unconvinced on the viability of the SB as a learning tool.

Equally important to the students are the experiences and the expertise of the teachers which are commonly shared in a traditional learning environment (onsite sessions). The students believed that the stories and anecdotes or the actual experiences of the teachers, help them to understand the lessons in practical terms. The opportunities for sharing is less in a VLE. Students learned vicariously through the practical experiences of their mentors. Indeed, Lineses (2012), reiterated that students prefer face-to-face engagements which make more interactions possible.

Students expressed that they could have learned more when they are guided. In a VLE however, only general instructions were provided. Learning could have been further optimized had they been given periodic guidance.

NUANCES OF POWER

(Performativities and Fabrications in Virtual Learning Environment)

Bernstein (2001) contends that the pedagogic relation between the teachers and students is intrinsically asymmetrical and there are various strategies for disguising and masking the asymmetry. This implies that students still have a room to demonstrate their agency to perform and fabricate their interests in the way they deal with their teachers.

In response to the control of teachers in a pedagogic relation, the students resorted to particular sets of practices in which they impose upon themselves and one another to make themselves particular kinds of being (Rose, 1992 in Ball, 2001). One of the practices that students demonstrate to act out their power is through their acts of compliance and conformity. These are the fabrications to respond to the teachers' instructions. The compliance and conformity are on a shallow level, i.e. they simply abide to what the teachers want; in pursuit of their personal interests.

Another practice of the students to supplant their teachers is through their colluding with other students. They cooperate or conspire with one another to get ahead of their teachers particularly in the assessments. This strategy is regarded by the students as a tool to achieve their objective, i.e. to fulfill a requirement.

Out of the convenience digital connectivities provide; students take VLE less seriously and consequently become complacent with the demands of the virtual assessments. To some extent the students tend to ignore what the teachers provided and required in an online class. They become comfortable and lax as they attended classes in the comforts of their homes.

Students also practiced clarification to call the attention of the teachers. In pursuit of their interests, they provide an undeniable proof; such as *screen grab* to make known the oversight that most of their teachers commit in the SB. Even when the students already knew the answer or the deadline for instance, they tend to mask their resistance or to bargain for their interests by clarifications. Adams (2017) highlighted the role of instructional strategies as "critical" in fostering these student engagements in a VLE.

Discussions

In accordance with Bernstein's pedagogic practice as a cultural relay of contents and how these are relayed, the data exemplified this practice between the acquirer and the transmitter in a virtual environment. More than the "*what*" of the subject taught by the teacher, the rules of conduct in a pedagogic relation are observed so that students get to learn in VLE. Hierarchical, sequencing, and criterial rules (Bernstein, 2001) find their ways in a virtual world.

Hierarchical Rule suggests that the acquirer (or the transmitter) has to learn to be an acquirer (or a transmitter). This process of learning "entails the acquisition of rules of social order, character, and manner which became the condition for appropriate conduct in the pedagogic relation" (Bernstein in Ball, 2004). As such, students position themselves ready to take what the teachers shall tell them but not without a form of resistance or fabrication (Ball in Apple, et al., 2010).

Sequencing Rule demands that students need to learn something not directly taught or initiated by the teacher to catch up with their expectations in VLE. To Bernstein, this is the necessity of pacing or identifying how much students have to learn given the amount of time. Learning how to use and navigate the SB interface, camera, video, and other applications are construed as necessary in order for students to optimize their learning.

Criterial Rule, whether implicit or explicit however, is the awareness of the students of the standards that they have to meet in order to assume knowledge transmission or acquisition. In SB for instance, the mastery of the assessment (quiz or activity) is taken as the measure of learning in a virtual environment. This to Bernstein (2010) is the criteria that the acquirer is expected to take or apply to his own practices.

With respect to how the contents are relayed, the data suggest disparity on how the teachers transmit knowledge and to how the students regard optimal knowledge acquisition in VLE. All

of the informants explicitly indicated that learning is more effective through the traditional learning environment than through VLE. They contended that learning is optimized through self-learning more than the provision of materials that passively inform them of the lessons. They learned more vicariously through the experiences shared by the teachers' onsite and when they are guided as to the nuances in their process of learning.

According to Selwyn (in Apple et al., 2010), connectivity is seen to boost the individualization of meaning-making and consequently broadens the "possibilities of collaboration". This is parallel to what the students do in assertions of their performance and fabrications. Practices of collusion seem inevitable for students because of connectivities that VLE has provided.

The students resorted to self-management as a form of response or resistance to the desires of their teachers in VLE. Foucault (Evans, et. al, cited in Apple et al., 2010) regarded these practices of fabrications as "Technologies of the Self" whereby individuals or populations are encouraged to regulate and continually work on their bodies and 'self-regulate' in pursuit of their interests.

Students in a VLE have broader avenues to assert their agencies because of digital connectivities. The Internet, said Selwyn (in Apple et al., 2010), "is able to liberate the user from social structure and hierarchy, boosting individual freedoms and reducing centralized controls over what can and what cannot be done". This element of connectivity in VLE implies the reconfiguration of the social tendencies and the breaking down of barriers between teachers and students.

Quoting Nunes, Selwyn (2010): centrality of the role of the students in the transmission and acquisition of knowledge is facilitated by internet connectivities:

> *"Transmission in other words is figured as a performative event in the hands of the student, thereby repositioning the student in relation to institutional networks. To this extent, the [student] is anything but marginal; as both the operator that enacts the class and the target that receives course content, the student occupies a metaphorical and experiential centre for the performance of the course"*

Borrowing from Psychology, this is equated with Online Disinhibition Effect (Suler, 2004; Terry, 2016), which refers to the lack of restraint that one feels when communicating online than in person. Though identified in SB, the nature of interaction that is more often asynchronous and the empathy deficit for the lack of verbal feedback and facial interaction contributed to how students feel disinhibited online.

In the words of an informant, the space in a virtual world has flattened. The tendency of the students is to be informal and impersonal and thus, less likely inhibited. Consequently, the authority and the presence of the teacher in VLE are muted; relative to students.

The notion of personalization of learning in which, according to Selwyn (in Apple et al., 2010), reverses the logic of education where the learners are at the center of networks of learning opportunities so that the system conforms to the learners rather than the learner to the system in their exercise of power. Similarly, Jarvis (Ball, 2000) argued that once the structure is

loosened or weakened, the students become more significant (individual learning) in their space in education

Conclusion

In response to the aspects of the globalization discourse to conform educational policy and provisions to the needs of capital in many international settings (Maguire in Apple et al., 2010), universities opted to install a learning management system, i.e. the Schoolbook in VLE. This platform provides for pedagogic practice of knowledge transmission/acquisition and its concomitant exercises of power.

Students (and teachers alike) become active participants in knowledge re/production with their use of "technologies of the self" evident through their performance and practices of fabrications. VLE also liberates students from social structure and hierarchy with the impersonal nature of digital connectivities brought by the internet.

Reflections and Implications

While VLE is the thing of the modern society (or the narrative that requires societies to be taught or to learn new information with the new platform), it merits close consideration and careful thought to make sense of how it reconfigures the social platform.

From the vantage points of the students, VLE is less preferred by all of the informants than the traditional learning environment. The students believe that they learned better and that there is no substitute for the physical presence of the teacher in a pedagogic relation. The data further suggest that there are more challenges to the VLE at this juncture than answers to their educational quest.

Schools and universities that utilize learning management system must take into consideration the preparedness of the teachers to use a virtual platform inasmuch as the establishment of infrastructural/technological requisites of internet speed and reliability.

Learning management systems are multimillion dollar enterprises. NEO, the provider of DLSU-D Schoolbook, for instance charges $0.60 per student per month for the Enterprise Edition (https://www.neolms.com/info/plans). In a casual interview with the Director of the Center for Innovative Learning Program (CILP) of the university that manages the Schoolbook; DLSU-D accordingly, charges P250 per student per semester of miscellaneous fee for it. Doing the math, this translates to a whooping P6.5M per year for around 13,000 students of DLSU-D alone.

Following the rhetoric of Selwyn (2010); *who* now benefits and in *what* ways from the connectivities supported by the internet and other digital technologies?

References

Adams, Nan B. (2017). *The Knowledge Development Model: Responding to the Changing Landscape of Learning in Virtual Learning Environments.* International Association for Development of the Information Society (14th Conference).

Ball, S. (2001). *Performativities and Fabrications in the Education of Economy.* In Ball, S. (ed.). The Routledge Falmer Reader in Sociology of Education. New York: Routledge Farmer, pp. 143-155.

Bernstein, B. (2003). *Social Class and Pedagogic Practice.* In Ball, S. (ed.). The Routledge Falmer Reader in Sociology of Education. New York: Routledge Farmer, pp. 196-217.

De La Salle University-Dasmarinas (n.d). Accessed from https://www.facebook.com/pg/DLSU.Dasmarinas/about/?ref=page_internal. Retrieved on May 19, 2017.

De La Salle University-Dasmarinas (2014). *Schoolbook User Guide for Teachers*. Accessed from http://www.dlsud.edu.ph/Offices/ETC/assets/docs/Schoolbook_User_Guide_for_Faculty.pdf. Retrieved on May 19, 2017.

Dussel, I. (2010). *Foucault and Education.* In Apple, M. (eds.). The Routledge International Handbook of the Sociology of Education. New York: Routledge, pp. 27-36.

Evans, J., Davies, B., and Rich, E. (2010). *Schooling the Body in a Performative Culture*. In Apple, M., Ball, S. & Gandin, L. (eds.). The Routledge International Handbook of the Sociology of Education. New York: Routledge, pp. 200-212.

Foucault, M. (1980). *Power/Knowledge: Selected Interviews and other Writings*. New York: Pantheon.

Franetovic, M. (2011). *A Higher Education Case: Millennial Experience Toward Learning in a Virtual Learning Environment Designed as an Authentic Learning Environment* (Unpublished Doctoral Dissertation). Wayne State University, Michigan.

Jarvis, P. (2000). *Globalisation, the Learning Society and Comparative Education.* In Ball, S. (ed.). The Routledge Falmer Reader in Sociology of Education. New York: Routledge Farmer, pp. 72-85.

Lineses, E. (2012. *Cultural Appropriation: Language and Expression of Millennial Learners*. (Unpublished Research). De la Salle University-Dasmarinas, Cavite, Philippines.

Luke, C. (2006). Cyberpedagogy. In J. Weiss, J. Nolan, J. Hunsinger, & P. Trifonas (eds.), *The International Handbook of Virtual Learning Environments*. The Netherlands: Springer, pp. 269-278.

NEO (n.d.). Accessed from https://www.neolms.com/info/plans. Retrieved on May 19, 2017.

Roberston, S. (2010). *'Spatializing' the Sociology of Education. Standpoints, Entry Points, Vantage Points.* In Apple, M., Ball, S. & Gandin, L. (eds.). The Routledge International Handbook of the Sociology of Education. New York: Routledge, pp. 15-26.

Rocina, J. (2017). Students' Perception of the E-class as a Learning Tool: the Dela Salle University-Dasmarians Experience. *Journal of Institutional Research of Southeast Asia.* Volume 15. Issue No. 2.

Selwyn, N. (2010). *The 'New' Connectivities of Digital Education.* In Apple, M., Ball, S. & Gandin, L. (eds.). The Routledge International Handbook of the Sociology of Education. New York: Routledge, pp. 90-98.

Suler, J. (2004). "The Online Disinhibition Effect". *Cyber Psychology & Behavior*, pp. 321–326.

Terry, C. (2016). "The Emerging Issue of Digital Empathy". *American Journal of Pharmaceutical Education*. Volume 80, Issue No. 4.

Weller, M. (2007). *Virtual Learning Environments- Using, Choosing, and Developing your VLE.* New York: Routledge.

Weiss, J. (2006). Introduction: Virtual Learning and Learning Virtually. In Weiss, J. et al. (eds.). *The International Handbook of Virtual Learning Environments*. The Netherlands: Springer, pp. 1-37.

Effect of Cooperative Learning and Programmed Education on the level of Skill Performance and Knowledge Achievement in Volleyball

Mo'een Ahmad Oudat
The Hashemite University, Jordan

ABSTRACT

This study aimed to identify the effect of the cooperative learning and programmed education on the level of the skill performance and knowledge Achievement in volleyball, for the volleyball student's course in the faculty of physical education, the Hashemite University. The sample consisted of (48) students distributed over two equal groups. The first experimental group students were taught by the cooperative learning method, and the second experimental group students were taught by the programmed education, during the second semester of the academic year 2017/2018. The means, standard deviations and T-test were calculated to determine the differences between the groups. The results showed statistically significant differences at ($\alpha \leq 0.05$) level between the pre-post measurements of the two groups in the skill performance level and knowledge achievement in certain volleyball skills, in favor of the post measurements. The findings further showed statistically significant differences at ($\alpha \leq 0.05$) level between the post measurements of the two groups in the skill performance level in favor of the first group. There were no statistically significant differences at ($\alpha \leq 0.05$) level between the post measurements of the two groups in the knowledge achievement level. The researcher recommended the use of cooperative method in teaching volleyball skills, and use modern teaching methods on the different activities.

Keywords: Cooperative learning, programmed education, skill performance, knowledge achievement,

Introduction

The educational process plays an important role in the future of the nations that look forward for advancement and progress. Therefore, the civilized world countries placed attention to this field and guided all their efforts to work on it. The teaching profession received attention and study not given to other professions. The teaching process elements consist of the efficient, modernized teacher, who represents the core of the educational system, the modernized developed curriculum, which aims at "making" the positive student, and the student who is the focus of the educational process (Hasan, 2005).

The physical education lesson success relies on the method, style or strategy applied in teaching, through which the students acquire motor skills (Oudat, 2012). The teacher is no longer representing the supreme authority that determines everything. His job is also no longer confined to providing information and facts. Rather, he is the director and organizer of the educational experiences that facilitate teaching to fit the student's readiness and abilities, as well as the demands of his community. Furthermore, the student is no longer the negative aspect of the learning process. Good teaching is the teaching that works toward creating teaching situations that contribute to the achievement of the desired targets. As for the students, it is unacceptable to view them as repetitive patterns, but everyone should be viewed as Individual case it has interests, tendencies, capabilities and problems (Yasin, 2012).

Teaching methods and styles are among the important curriculum components that the teacher uses to achieve his objectives. It is a communication process between the teacher (sender) and the student (receiver). This led the physical education teacher to use more than one style to convey the information to the students, as there is no single one teaching method that can contribute to the perfect development of the student. In this concern, the efficient teacher is the one who can provide the new thing continuously (Abdel Baqi et al, 2011; Darwesh, 1996).

The cooperative learning method is a participatory process carried out between many individuals in a learning situation in the form of small groups ranging between 4 and 6 students. The roles are distributed over the group to increase the learning effectiveness during the lesson application stage. Cooperation between the students takes place in the performance and role exchange to achieve a common objective. A part of the lesson may be allocated to every student, which he should learn well, and will be assigned to teach it to the rest of the group (Hamdan, 2011; Izedein, 2002).

The use of the cooperative method is important for the teacher, as it reduces the time required to present the information and explanation; and reduces the teacher's effort in following-up every student. In addition, the feedback is given to the group, not to every student. Teachers use this method because it realizes better learning and more satisfaction and gratification (Ibrahim, 2004; Rattigan, 1996). Modern educational trends emphasize the importance of the individual learning, which shifts the educational process focus from the course material to the student. It highlights him to unfold his tendencies, readiness, abilities and self-skills, to plan, develop and direct these components according to a particular educational "recipe", to keep up with his needs and stimulate his personal motivations and desires (Jawad & Dawod, 2012)

Successful cooperative learning can be achieved with group-work tasks that provide the opportunity for students to work together. While completing a task, the students' cognitive styles and the nature of the task affect their use of learning strategies. The students are able to appreciate

that each stage of doing the task may require different learning strategies. It is not only knowledge that they learn from each other, but also how to interact with others appropriately (Parnrod & Darasawang, 2018; Tran, 2014).

Programmed education is one of the self-learning styles, which enable the individual teach himself by his own through a program specially devised for this purpose, based on the behavioral theory in psychology. The scientific material is presented in the form of a programmed book, teaching aid or programmed film, divided into small-organized units or modules. The teacher doesn't move from one unit to another before the preceding unit is learnt (Mahmoud & Oudat, 2007).

Programmed education has many characteristics such as increasing the effectiveness of the programed materials in education, upgrading the teacher's efficiency to achieve the objectives, and forming positive trends by the learner when he uses the programmed education (A'abed, 2002). This type of education is fit for teaching all skills once prepared in conformity with the programmed education bases and principles. The programmed book is one of the most important ways of the programmed education, which achieved results better than other ways (Othman, 2003).

The significance of the current study lies in the use of methods capable to overcome the traditional methods and obstacles. It also highlights the strengths and weaknesses in the applied teaching methods and provides scientific proofs on the validity and effectiveness of two other teaching methods for teaching physical education, and the success of these two methods in the educational field, as well as their effect on learning certain volleyball skills. And increases of teachers' awareness of factors, such as the nature of the task, the different characteristics of students, and different teaching styles, they use, which can contribute to teaching and learning implementing, and successfully the education process.

Study Problem

Throughout the researcher's work in the university teaching field, and after reviewing the scientific studies of physical education teaching methods, he found that the currently applied teaching method does not fit the modern developments, nor does it fit the learners' characteristics. This encouraged the researcher to use nontraditional teaching methods (the cooperative learning and programmed education methods) in teaching volleyball skills capable to upgrade the cooperation level among the students, employ the learning skills with high effectiveness, contribute to the student's development in both behavior and knowledge; and, subsequently, achieve the educational objectives.

Objectives

The study aimed to identify the effect of the cooperative learning and programmed education on the level of skill performance and the knowledge achievement in some volleyball skills (Serving, Defense, Setting, and Spiking).

Questions

1- Are there statistically significant differences at ($\alpha \leq 0.05$) level between the pre-post-measurements in the level of skill performance in some volleyball skills?

2- Are there statistically significant differences at ($\alpha \leq 0.05$) level between the pre-post-measurements in the level of knowledge achievement in some volleyball skills?

3- Are there statistically significant differences at ($\alpha \leq 0.05$) level between the post-measurements of the two groups in the level of skill performance in some volleyball skills?

4- Are there statistically significant differences at ($\alpha \leq 0.05$) level between the post-measurements of the two groups in the level of knowledge achievement in some volleyball skills?

Methodology

The researcher applied the experimental method because it suits the nature of this study. The sample was chosen by the intentional way and consisted of (48) students of the volleyball course in the faculty of physical education and sports sciences in the Hashemite University during the academic year 2017/2018.

Variables

- **Independent variables:** Cooperative learning, Programmed education methods.
- **Dependent variables:** Level of the skill performance and knowledge achievement.

Procedures

The sample participants were distributed over two equal groups. The pre-measurements were taken during the second week of the study. Later, the two groups were taught for four weeks at the rate of (12) teaching units per group. The first group was taught with the cooperative learning method and the second was taught with the programmed education method. The post-measurement was taken in the last week of the study.

Cooperative and Programmed unit preparation steps

The researcher benefited from the studies (Parnrod & Darasawang, 2018; Oudat, 2010 and Hasan, 2005) to determine the preparation steps of the cooperative and programmed unit (defining the desired behavior, defining the learners' characteristics, determining the strategies, determining the teaching units and finally, evaluation).

Study Instrument

The researcher benefited from the studies (Oudat, 2010; Al-Mowafi, 2004; Salem, 2002) to determine the physical tests (flexibility, agility, speed, accuracy), and the skill tests (serving, defense, setting, spiking); and knowledge achievement (rule, skill). Some tools were also used in both the physical and skill tests (volleyballs, medical balls, cones, measuring tape, stopwatch, and whistle). The achievement test was defined through determining the (purpose of the test, test sources, knowledge levels, axels, wording, and test instructions). The knowledge test consisted of (35) items distributed over three axes (remembering, understanding and application). The knowledge test was given (15) minutes for answering the items. Group's parity was verified in physical performance, skill performance and knowledge achievement of the two groups, as shown in table (1). Descriptive statistics {i.e., means (M) and standard deviations (SDs)} and T-test were performed for the purposes of this study by using (SPSS).

Table 1. T value between the premeasurements of the groups in the physical performance and skill performance and knowledge achievement.

Tests	Variables	First Group		Second Group		T	Sig.
		M	SD	M	SD		
Physical	Flexibility	13.89	2.13	12.80	2.40	0.451	1,251
	Agility	7.81	0.84	7.51	0.97	1.377	2.140
	Speed	3.80	0.56	4.01	0.71	0.190	5.012
	Accuracy	3.85	0.65	3.72	0.68	0.957	4.110
Skill	Serving	3.48	0.60	3.10	0.47	1.430	4.214
	Defense	3.10	0.65	2.98	0.41	0.550	2.132
	Setting	4.27	2.55	3.90	1.10	0.580	1.025
	Spiking	3.89	1.10	3.30	1.70	0.820	4.540
Knowledge	Rule	14.05	3.71	13.65	4.10	0.340	1.420
	Skill	4.98	1.53	4.36	1.42	1.700	4.920

Table 1, did not shows statistically significant differences at ($\alpha \leq 0.05$) level between the pre-measurements of the groups in the physical performance and skill performance and knowledge achievement, which indicates the parity of the groups in all the tests.

Psychometric Properties

Validity of the study instrument was verified by using the content validity and was presented to five specialists in volleyball teaching. Ease/difficulty coefficients of the knowledge achievement test phrases were obtained, which were between 0.86 and 0.20. The researcher calculated the instrument reliability coefficient using the test and retest, where the skill test reliability coefficient was (0.88). Finally, Pearson Correlation Coefficient between the pre-post measurements of the knowledge test was obtained. The correlational relationship was significant between the two measurements in all the variables.

Results and Discussion

Results of the first question: Are there statistically significant differences at ($\alpha \leq 0.05$) level between the pre-post measurements in the level of skill performance in some volleyball skills? Tables (2 and 3) display the results of the analysis data.

Table 2. T Value between the Pre-Post Measurements of the First Group in the Skill Performance Level

Skills	First Group				T	Sig.
	Pre-measurement		Post-measurement			
	M	SD	M	SD		
Serving	3.48	0.60	6.50	0.48	9.512	0.000
Defense	3.10	0.65	6.13	0.43	6.342	0.010
Setting	4.27	2.55	6.89	7.71	14.501	0.000
Spiking	3.89	1.10	6.80	7.90	15.142	0.000

Table 2, shows statistically significant differences at (α≤0.05) level between the pre-post measurements of the first group in the skill performance level, in favor of the post-measurement. This is an indication that the cooperative method has a positive effect on learning certain volleyball skills. The researcher attributes this finding to that the cooperative learning method enhances the group and contributes in reducing the worry levels through exchange of questions among the students while performing the skill without any difficulty. This finding is in line with that of (Slavin, 2013; Oudat, 2010; Dudley et al, 2010 and Al-Omari, 2002), in that the cooperative learning method contributes in providing continuous feedback, creates a continuous motivation with the learner, and takes into account the individual differences among the students. In addition, it assists in shifting the activity from the teacher to the learner, because the student has to rely on himself, leaving the job of direction and organization of the teaching process to the teacher.

Table 3. T Value between the Pre-Post Measurements of the Second Group in the Skill Performance Level

Skills	**First Group**				**T**	**Sig.**
	Pre-measurement		Post-measurement			
	M	SD	M	SD		
Serving	3.10	0.47	4.78	0.60	7.660	0.000
Defense	2.98	0.41	4.50	0.47	2.580	0.000
Setting	3.90	1.10	4.79	0.51	19.037	0.010
Spiking	3.30	1.70	4.36	0.60	10.349	0.000

Table 3, shows statistically significant difference at (α≤0.05) level between the pre-post measurements of the second group in the skill performance level, in favor of the post-measurement. The researcher attributes this result to that the programmed education method contributes in improving the skill performance through the information found in the booklet. Splitting the information into small units increases the positive interaction between the students, which raises the learner's efficiency in performing the required skills and achieving the objectives. The researcher is in agreement with the studies of (Hasan, 2005; Othman, 2003) in that the programmed education has a positive effect in acquiring and developing the basic skills and raising the performance level.

Results of the second question: Are there statistically significant differences at (α≤0.05) level between the pre-post measurements in the level of knowledge achievement in some volleyball skills? To answer this question, the M, SD and T-test of the difference significance between the experimental groups were obtained, as shown in Tables (4 and 5).

Table 4. T Value between the Pre-Post Measurements of the First Group in the Knowledge Achievement in some Volleyball Skills.

Variables	**First Group**				**T**	**Sig.**
	Pre-measurement		Post-measurement			
	M	SD	M	SD		
Skill	14.05	3.71	19.70	3.90	13.16	0.000
Rule	4.98	1.53	6.88	1.58	6.20	0.000
Total	18.70	4.60	26.60	4.30	13.20	0.000

Table 4, shows statistically significant difference at (α≤0.05) level between the pre-post measurements of the first group in the knowledge achievement level, in favor of the post-measurement. The researcher attributes this result to that the cooperative learning method ranges from the easy to the difficult. It provides the students chances to raise their knowledge achievement, which is associated with the learner's activity, develop the thinking skills, and upgrade the motivation for learning and self-dependence. This result is in agreement with the results of (Khalaf, 2002; Khalil, 2002) in that working in small groups realizes learning objectives, forms positive attitudes and achieves educational objectives associated with the knowledge area, as well as exchange of thoughts among the students.

Table 5. T value between the pre-post measurements of the second group in the knowledge achievement in some volleyball skills.

Variables	**First Group**				**T**	**Sig.**
	Pre-measurement		Post-measurement			
	M	SD	M	SD		
Skill	13.65	4.10	19.32	4.24	9.23	0.000
Rule	4.36	1.42	7.14	1.58	13.28	0.000
Total	18.36	4.75	26.50	5.51	11.80	0.000

Table 5, shows statistically significant difference at (α≤0.05) level between the pre-post measurements of the second group in the knowledge achievement level in some volleyball skills, in favor of the post-measurement. The researcher is in line with (Saleh, 1996; A'abed, 2002) in that the programmed education increases the cognitive wealth with the students through dividing the educational modules into small units, which are easy to memorize and perform continuously.

Results of the third question: Are there statistically significant differences at (α≤0.05) level between the post- measurements of the groups in the level of skill performance in some volleyball skills? Table (6) display the results of the analysis data.

Table 6. T value between the post-measurements of the groups in the skill performance in some volleyball skills.

Skills	**First Group**		**Second Group**		**T**	**Sig.**
	M	SD	M	SD		
Serving	6.50	0.48	4.78	0.60	2.980	0.000
Defense	6.13	0.43	4.50	0.47	4.240	0.000
Setting	6.89	7.71	4.79	0.51	3.910	0.000
Spiking	6.80	7.90	4.36	0.60	3.220	0.000

Table 6, shows statistically significant differences at the (α≤0.05) level between the post-measurements of the two groups in the skill performance level, in favor of the first group. This finding is in agreement with (Khasawneh et al, 2011; Abu Al-Ata, 2005) in that the cooperative learning method depends on the students' positive cooperation and interaction with each other, where the role of the teacher is providing the students support and encouragement to improve the performance and achieve the objectives.

Results of the fourth question: Are there statistically significant differences at ($\alpha \leq 0.05$) level between the post- measurements of the groups in the level of knowledge achievement in some volleyball skills? Table (7) display the results of the analysis data.

Table 7. T value between the post-measurements of the groups in the knowledge achievement in some volleyball skills.

Skills	First Group		Second Group		T	Sig.
	M	SD	M	SD		
Skill	19.70	3.90	19.32	4.24	0.350	5.18
Rule	6.88	1.58	7.14	1.58	0.655	2.22
Total	26.60	4.30	26.50	5.51	0.080	9.41

Table 7, shows that there are no statistically significant differences at the ($\alpha \leq 0.05$) level between the post-measurements of groups in the knowledge achievement. This indicates that both the cooperative and programmed methods led to an improvement in the students' knowledge achievement in learning certain volleyball skills. The researcher is in line with (Hasan, 2005; Hijazi, 2003) in that both methods resulted in forming positive attitudes with the learners, and contributed to the development of (remembering, understanding and application) skills.

Conclusions

The results of this study it increases of teachers' awareness of factors, such as the nature of the task, the different characteristics of students with different cognitive styles, and the choices of learning strategies they use, which can contribute to success in implementing learning. And also help teachers to accommodate students with different cognitive styles so that they can participate successfully in education process. This is evident through the results of the study, which showed differences in the learning process and improved performance through using of the teaching styles (cooperative learning and programmed education) as follows:

- And there were differences between the pre-post measurements of groups in the skill performance and knowledge achievement in some volleyball skills, in favor of the post-measurements.
- And there were differences between the post measurements of groups in the skill performance in some volleyball skills, in favor of the first group (cooperative learning).
- There are no statistically significant differences between the post measurements of groups in the knowledge achievement in some volleyball skills.

Recommendations

In the light of the study results, the researcher recommends the following:

- Use of cooperative learning method and programmed education method in teaching volleyball skills.
- Utilizing the objectives of the cooperative learning method and programmed education method in achieving the teaching strategies.

- Encourage students to achieve goals in a more collaborative and effective way in teamwork.
- This study may also be replicated with other sets of participants.

Limitation

Due to the nature of the study design, the study has severed all limitations: a) the finding are generalizable only to the target students and to the same setting; b) the extraneous of some variable of (such as training and participation of the participants in activities inside and outside the university) cannot be completely controlled.

References

A'abed, M. A. (2002). Effect of the use of the programmed education method on the knowledge achievement level of certain articles of the international amateur boxing law for the Faculty of Physical Education students in Al-Mansoura University, *Journal of Physical Sciences and Sports, 1*(1), 32-51.

Abed Al Baqi, M., Fareed, S., Abed Al Reda, H., Laekh, K., & Mohammad, S. (2011). The education skills for the teachers of physical education in the Governorates of the middle Euphrates, *Journal of Physical Education Sciences, 4*(3), 36-53.

Abu Al-Ata, A. S. (2005). *Effectiveness of the use of both the cooperative and reciprocal methods in the knowledge and skill achievement of certain handball skills for the preparatory stage pupils*, Unpublished MA Thesis, Faculty of Physical Education, Al-Mansoura University, Egypt.

Darwesh, A. K. (1996). *Teaching in the physical education and sport, methods, strategies, and evaluation*, Al-Ma'aref Corporation, Alexandria.

Dudley, B. S., Johnson, D. W., & Johnson, R. T. (2010). Using Cooperative Learning to Enhance the Academic and Social Experiences of Freshman Student Athletes, *The Journal of Social Psychology, 4*(137), 449-459.

Hamdan, A. Y. (2011). The Effect of Using Cooperative Learning Style of Skill Performance Level of Some Skills in Basketball Among Students of Physical Education and Sport in Al-Aqsa University, *Journal of Islamic University, 19*(2), 487-511.

Hasan, M. S. (2005). *Effect of both the cooperative and programmed learning methods in performing certain basic skills of the (Female) beginner boxers*, Unpublished MA Thesis, Faculty of Physical Education, Al-Mansoura University, Egypt.

Hijazi, R. M. (2003). *Effectiveness of the cooperative learning strategy in the achievement of the elementary stage students in science, and their trends toward the collective work*, Published MA Thesis, Faculty of Education, Al-Mansoura University, Egypt.

Ibrahim, M. A. (2004). *Teaching strategies and learning methods*, Anglo Egyptian Bookshop, Cairo.

Izedein, A. (2002). *Modern trends in physical education teaching methods*, Shajarat Al-Dorr Bookshop, Al-Mansoura, Egypt.

Jawad, B. E., & Dawod, M. A. (2012). Effect of cooperative learning in learning spike and defense court skills in Volleyball, *Al Fateh Journal*, *1*(50), 162-176. https://doi.org/10.1080/00224549709595461 Pages 449-459

Khalaf, W. A. (2002). *Effectiveness of the use of certain teaching methods in learning the swimming skills*, Unpublished Ph.D. Dissertation, Faculty of Male Physical Education, Helwan University, Egypt

Khalil, M. Y. (2002). *Effectiveness of the cooperative learning in teaching certain complex skills in boxing sport for beginners*, Unpublished Ph.D. Dissertation, Faculty of Male Physical Education, Helwan University, Egypt.

Khasawneh, G., Dhiabat, M. K., & Abu Al kishik, M. (2011). Effect of teaching using the cooperative learning strategy on the skill performance level and female students' attitudes toward the gymnastics sport in the faculty of physical education, *An-Najah National University Journal for Research- Humanities, 1*(250), 83-110.

Mahmmod, I, G., & Oudat, M. A. (2007). The Effect of Cooperative Learning style in Developing Fundamental Movement Skills in Physical Education Lesson, *Journal of Educational Sciences*, Qatar University, *1*(13), 379-397.

Al Mowafi, A. (2004). *Effect of the use of certain teaching methods on the skill and knowledge performance achievement levels in volleyball for the faculty of physical education students*, Unpublished Ph.D. Dissertation, Faculty of Physical Education, Al-Mansoura University.

Al-Omari, A. H. (2002). *Effect of the cooperative learning method and commands method on the performance level of the vision lift in weightlifting sport for the faculty of physical education students (Comparative study)*, Unpublished MA Thesis, Faculty of Physical Education, Al-Mansoura University, Egypt.

Othman, M. I. (2003). *Effect of the use of the programmed education on teaching basic skills of the kickboxing sport*, Unpublished MA Thesis, Faculty of Male Physical Education, Helwan University, Egypt.

Oudat, M.A. (2012). A Comparative study of the impact of some teaching styles applied on certain physical and skill variables in basketball for the Faculty of Physical Education and Sport Science Students at the Hashemite University. *International Journal of Academic Research, Part B, 4*(6), 83-89.

Oudat, M. A. (2010). The Effectiveness of Using the Cooperative and Reciprocal Learning Style in Motor Achievement on some Table Tennis for Hyper Basic Stage Student. *Physical Education Sciences and Arts Journal, Assiut University, 31*(1), 1-27.

Parnrod, U., & Darasawang, P. (2018). Group-Work and Learning Strategies by EFL Students with Different Cognitive Styles: Closing Gaps for Implementing Cooperative Learning in Language Classroom, *Journal of Institutional Research South East Asia 16*(1), 71-94.

Rattigan, P. (1996). *A study of the effects of cooperative, competitive and individualistic goal structures on skill development, affect, and social integration in physical education classes*. Unpublished Ph.D. Dissertation, University of Minnesota.

Saleh, N. M. (1996). *Effectiveness of the ramified programmed education on learning basic handball skills*, Unpublished MA Thesis, Faculty of Female Physical Education, Helwan University, Egypt.

Salem, M. (2002). Effect of the use of certain teaching methods in teaching some gymnastics skills for the secondary education female students, *The Scientific Journal for Research and Studies in Physical Education*, (4).

Slavin, R. E. (2013). *Classroom applications of cooperative learning*. In S. Graham (Ed.), APA handbook of educational psychology, Washington, DC: American Psychological Association.

Tran, V. D. (2014). The effects of cooperative learning on the academic achievement and knowledge retention *International Journal of Higher education, 3*(2), 131-140.

Yasin, I. (2012). *Difficulties That Faced Students in the Faculties of Physical Education and Sport in the Practical Aspects of Gymnastics Courses at the Islamic University*, Unpublished Master Thesis, Islamic University of Gaza.

The Effect of Brain Dominance on the Relationship between Learning Styles and Japanese Language Academic Achievement

Hui-Suan Wei
Faculty of Applied Communication, Multimedia University Malaysia

Tajularipin Sulaiman
Faculty of Educational Studies, Universiti Putra Malaysia

ABSTRACT

Languages have become an important tool in the borderless global communication and interaction. A significant increase in the number of foreign language learners has been recorded and the research of Japanese teaching and learning has significantly increased. However, teaching and learning Japanese Language is a challenge because students learnt differently. This study aimed to explore the mediation effect of Left-brain and Right-brain Dominance on the relationship between Learning Styles and Japanese Language Academic Achievement. The results showed that Left-brain and Right-brain Dominance had full mediation effect on the relationship between Learning Styles and Japanese Language Academic Achievement. The effect of Left-brain Dominance on Japanese Language Academic Achievement was statistically significant at 0.001 level with the standardized effects of 0.245. Whereas the effect of Right-brain Dominant on Japanese Language Academic Achievement was statistically significant at 0.001 level with the standardized effects of 0.258. The results showed that four sub-constructs of learning styles were the indicators for Japanese language learning. However, these Learning Styles did not significantly influence a student's Japanese language academic achievement due to its weak effect i.e. 0.041 in terms of its relationship strength. The Left-brain and Right-brain Dominance has an impact on individuals' learning styles whereby the activities in the brain halves could overtake Japanese language learning. In any case, the consideration of the strategies of Learning Styles, Left-brain and Right-brain learning strategies would enhance the results of Japanese Language Academic Achievement.

Key words: Learning Styles, Japanese language teaching and learning, Left-Brain Dominance, Right-Brain Dominance.

Introduction

Recent years have witnessed an interest in foreign language education and language learning because of globalisation needs. Therefore, the ability to communicate in foreign languages has become a need in the international economic, social, political and entertainment arena. This dramatic increase specifically in Japanese Language can be attributed to Japanese entertainment such as drama, songs, comics, animation and games that have gained global popularity. Since the 1980s, a significant increase in the number of foreign language learners has been recorded and the research of Japanese teaching and learning has significantly increased.

There are many factors that contribute to effective foreign language learning. These factors can be generally divided into two categories; first, the internal factors such as age, personality, internal motivation, experience, cognition, native language, and second, the external factors such as curriculum, instruction, culture and status, extrinsic motivation and access to native speakers (Lightbown et al., 2013). Among the factors mentioned, individual cognitive ability such as intelligence and language aptitude, and individual learning preference such as Learning Styles play an important role in enhancing the mastery of the language when the environment is not conducive enough to escalate the learning process.

Japanese is considered a difficult language as it consists of three kinds of basic writing system i.e. Hiragana, Katakana and Kanji. The differences in students' background such as spoken language, first language and second language created challenges in teaching Japanese language in the classroom. Moreover, the students who came from different faculties exhibited different abilities in learning. Some students prefer to write and take note while learning, some students prefer group study, and some students prefer to have hands-on activities etc. in the classroom. Bollinger (2013) stated that the diversity of students engaged in higher education continues to expand. Students come to the university with varied ethnic and cultural backgrounds, from a multitude of training programmes and institutions, and with differing Learning Styles, and these result in differences in terms of students' progress of learning in the classroom. The language components and structure themselves are also a challenge for the students. Therefore, a teaching and learning strategies that inculcates learning style and cognitive ability is in need.

Theory of Learning Styles

Theory of Learning Styles VARK was initiated by Neil Fleming in 1992. VARK was proposed with the notion to address students' differences in Learning Styles. The VARK Learning Styles was suggested based on the observations and interviews with students (Fleming, and Baume, 2006). The acronym for VARK stands for the Visual, Aural, Read/write, and Kinaesthetic sensory modalities used in learning (Fleming, 2006, 2012). Fleming and Baume (2006) stressed that learners can benefit by knowing their own learning style, by considering how and when they learn, as part of a reflective, metacognitive process, followed by the

relevant action that aids learning. VARK provides a perceptual learning style profile for each student.

Visual learners capture information by using their eyes. They prefer information in symbolic form such as pictures, colours, and layout or in forms of graphs, charts, and flow diagrams. They prefer to draw maps for their learning sequences or create patterns of information. They are sensitive to different or changing spatial arrangements and can work easily with symbols. Auditory leaners prefer to receive information through the ear or in auditory form that can be "heard or spoken". Auditory learners prefer information in lecture format, group discussion, radio, using mobile phones, speaking, web-chat etc. They prefer to talk aloud as well as talking to oneself. They are sensitive to the information that come in in audio form. Read and Write learners prefer text-based teaching and learning. They access information from printed words. They prefer reading and writing in all forms to obtain the information i.e. written assignments, reports, essays, reading or writing manual. In addition, people who prefer this modality are often technology savvy. They like the internet, google, power point presentations, lists of words in Wikipedia, diaries, dictionaries, thesaurus, quotations etc. Kinaesthetic learners learn theory through practice, application and involvement in the learning process. They prefer real, multi-sensory experience by using all their senses i.e. touching, hearing, smelling, tasting and seeing in learning. They also learn through demonstration of skills by the instructor including videos and movies that demonstrate the real situation.

The Theory of Left-brain and Right-brain Dominance

The two halves of the brain are referred to as left-hemisphere dominance and right-hemisphere dominance (Sperry, 1964). The two halves of the brain process different tasks and activities of a person. Brain Dominance theory explains how the brain receives and processes information that leads to different understanding in communication that has been associated with learning and academic performance. In the Left-brain or Right-brain hemisphere dominance theory, the right hemisphere of the brain is best at expressive and creative tasks. On the other hand, the results from the electrode brain scans proved that the left-hemisphere is associated with logical, symbolic and sequential tasks, language, logic, critical thinking, numbers, calculations, and reasoning that involve rational and analytical thinking. Wade and Tavris (2012) claim that the left hemisphere is more intuitive and holistic; it comprehends visual imagery and make sense of what we see.

This study adopted Coloured Brain Communication (CBCI™) inventory that was developed by Arthur Carmazzi (Carmazzi, 2005). CBCI™ inventory is a psychometric tool that aims to solve communication frustrations in general. Theoretically, CBCI™ refers to the fundamental patterns in the way our brain genetically processes the information around us that are named in four different colours. These patterns influence the way an individual perceives and process the information. These patterns influence the way an individual perceives and process the information. There are four colours of brains, namely red brain, purple brain, blue brain and green brain. Each colour represents different way of thinking process when dealing with

information in learning, communicating, problem-solving, acting and reacting etc. (Carmazzi, 2005). These coloured brains were developed from the left and right brain theory in which red and purple brains have similar functions as explained in the left brain whilst the blue and green brains are similar to the right brain functions.

Learning Styles, Brain Based Learning and Foreign Language Learning

Across the years, studies provided evidence that there is a relationship between Learning Styles and cognitive (hemispheric processing model) and academic achievement (Sinatra, 1983; Fazeli, 2011). To make learning interesting, motivating and meaningful teaching is encouraged whereby teachers should use an appropriate mix of learning strategies, use a wide range of teaching and learning resources, accommodate different Learning Styles according to students' need and employ different classroom activities either for small groups or individually.

Previous studies have shown that Learning Styles are correlated with language learning. A recent review showed that over ninety percent of teachers in five countries (the United Kingdom, the Netherlands, Turkey, Greece and China) agreed that individuals learn better when they receive information tailored to their preferred Learning Styles. Chermahini, Ghanbari, and Talab (2013) who investigated the relationship between Learning Styles and the academic performance of students found that Learning Styles can be a good predictor of any second language academic performance, and it should be taken into account to enhance students' performances specifically in teaching and learning the second language.

Duman (2010) found that brain based learning increases academic achievement in the classroom. He claimed that the study made positive contributions to achievement by individualising the integration of whole class activities and teaching activities according to the different Learning Styles of the students.

Conceptual Framework

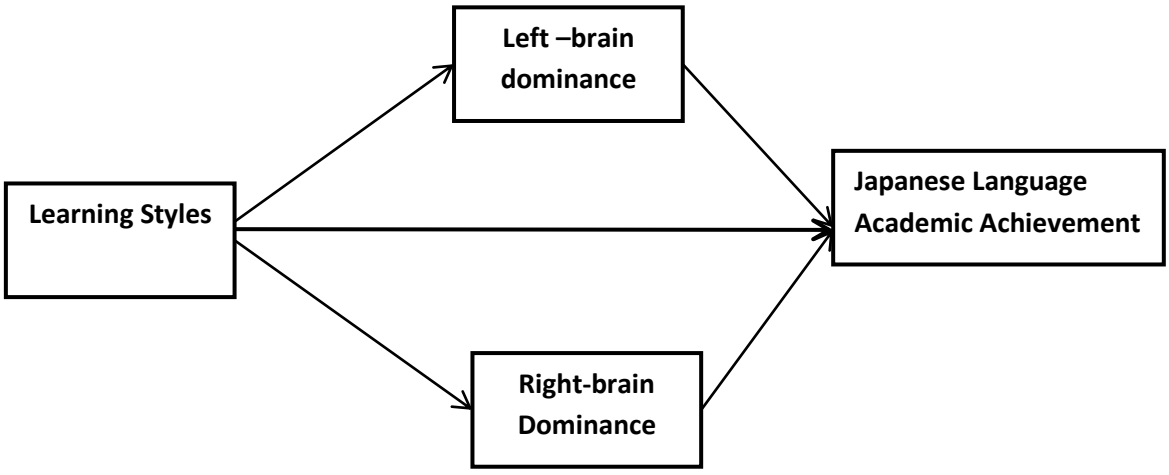


Figure 1: Conceptual framework

Figure 1 shows the conceptual framework of the study. This study investigated whether learning styles influences Japanese language achievement and if Left-Brain Dominance and Right-Brain Dominance mediate the relationship between learning styles on Japanese language achievement. The link between the independent variables and the dependent variables can probably be explained by some other mediating variables that are not in the scope of the current study too.

The Japanese Language Academic Achievement for each respondent is the formal final examination result generated after the final examination. The students sat for the test at the end of the trimester to test their knowledge of Japanese language that was learnt in the classroom. The examination designed comprised of 3 sections: vocabulary, grammar, comprehension and essay writing. The weightage of the three sections was 60%, 20% and 20% respectively. The Vocabulary section consisted of 10 questions on nouns and 10 questions on vocabulary used in greetings. The Grammar section consisted of 10 questions on question words, 10 questions on particles. The comprehension session consisted of 10 questions on sentence structure and the writing session consisted of 5 short sentences for writing. Permission to use the final examination results was obtained beforehand and granted by the Vice President Academic of the University.

VARK inventory was used in this study to measure respondents' learning styles. The VARK instrument was obtained from the open access website (http://www.vark-learn.com/english/page.asp?p=questionnaire). The questionnaire consisted of questions on the four variables in the second construct of this study. The four variables were visual, auditory, reading and writing, and kinaesthetic. Each variable consisted of ten items. All items were assessed using a 5-point Likert-scale.

The Colored Brain Communication Inventory (CBCI) is a Validated Psychometric Test by the American Institute of Business Psychology (https://coloredbrain.com/benefits-of-colored-brain/) aimed at learning the foundations of Genetic Brain Communication and Processing, and the universal applications to teamwork, leadership, sales and personal eeffectiveness. The questionnaire consisted of 20 questions on Left-brain Dominance and 20 questions on right brain dominance. All items were assessed using a 5-point Likert-scale.

Research Objective

The following objectives and hypothesis have been formulated to address the problems in Japanese Language teaching and learning. The objective of the study is to investigate the mediation effect of Left and Right Brain Dominance on the relationship between Learning Styles and Japanese Language Academic Achievement. The research question explored the mediation effect of brain dominance on the relationship between learning Styles and Japanese Language Academic Achievement. After that, research hypothesis was drawn based on the literature:

Hypothesis 1: Left-Brain Dominance mediates the relationship between Learning Styles and Japanese Language Academic Achievement

Hypothesis 2: Right-Brain Dominance mediates the relationship between Learning Styles and Japanese Language Academic Achievement.

Methodology

This is a descriptive study that employed a quantitative research methodology. Hypotheses of the study were analysed by using PLS-SEM in this study. PLS-SEM analyses fit the purpose of the study i.e. to determine the existence of the relationship between the variables and to what degree Learning Styles and brain dominance contribute to students' Japanese Language Academic Achievement.

The study employed purposive sampling with two hundred and eighty-one respondents with specific characteristics. The characteristics of the chosen respondents were first; they should be Japanese language students at the beginners' level. Second, the university should offer the subject as an elective subject. Third, the lecturers should use the textbook "Minna no Nihongo". Fourth, the students should have studied lesson 1 to lesson 6 of the textbook. Fifth, the students should have completed at least 36 hours of face-to-face classroom learning and not more than forty-two hours of learning.

Survey design were used for data collection in this study. The data collection in this study involves three sets of data scores i.e. the scores on Learning Styles, scores on Left-brain and Right-brain Dominance and scores on Japanese Language Academic Achievement obtained from students' final examination results. The items were generated based on the revision of the studies on learning style, and left and right brain characteristics. A pilot test was carried out with a group of selected respondents with the objective of refining the instruments. Besides, Left-brain and Right-brain Dominance were used as the mediators to examine the mediating effect between learning style with Japanese Language Academic Achievement. Following are the processes of the data analysis.

Data Preparation and Preliminary Analysis

Data screening was run to ensure that the data were correctly entered, free from missing values and outliers, and this was then followed by an examination of the distribution of normality of the variables. The screening of the data showed that there was minimal amount of missing data and these were replaced by using the variable median responses for each measurement item. The results of outliers examination also indicated that the standardised (z) scores of the cases for the research variables ranged from -3.663 to 2.425, indicating that none of the items exceeded the threshold of ±4. Thus, there was no uni-variate outlier detected among the 281 cases. The results of the assessment of normality indicated that the skewness and kurtosis of all 281 items were laid between ±2 and ±7 respectively. Therefore, it can be concluded that the data set of all items were well modelled by a normal distribution.

Next, mean and standard deviation of each variables i.e. Learning Styles, Left-Brain Dominance, Right-Brain Dominance and Japanese Language Academic Achievement (final examination result) were generated.

Table 01: Descriptive Statistics for Learning Styles, Left- brain Dominance, Right-brain Dominance and Japanese Language Academic Achievement

Constructs	Mean	Standard Deviation
2nd Order Constructs / Main Constructs		
• Learning Style (LSY)	3.117	0.751
• Left Brain Dominant (LBD)	3.651	0.638
• Right Brain Dominant (RBD)	3.514	0.703
• Japanese Language Result (JLR)	63.190	19.205

The results in Table 1 shows the four main constructs that were assessed in the 5 point Likert scale. Mean values of all other constructs were above their midpoint that was level 3 in the 5-point Likert scale. The phenomenon indicated that the respondents' perception toward these constructs were above the average. The results showed that the highest mean was Left-brain Dominance (mean = 3.651, SD = 0.638). As Japanese Language Academic Achievement was measured in continuous scale, the mean for this variable was 63.190 that is above the passing mark (fifty percent out of one hundred). The standard deviation of Japanese language was 19.205 that showed huge variability among the score of the respondents.

Assessment of measurement model

The measurement models or Confirmatory Factor Analysis (CFA) was used to assess the uni-dimensionality, reliability and validity of the constructs. The measurement model could therefore be said to define the manner in which latent or unobserved variables are assessed in terms of the manifest variables (Ho, 2006). Internal consistency which is the reliability of each of the constructs was assessed by Cronbach alpha (α), composite reliability (CR) and average variance extracted (AVE). The cut off point for composite reliability is CR > 0.6, Cronbach alpha is α > 0.7) and for AVE is above 0.5 for all constructs (Nunnally & Bernstein, 1994). Standardized factor loading was sorted to remove the invalid items in the survey of each variable. The cut-off point for the standardized factor loading is above 0.6 for each item. Therefore, the items above 0.6 should be removed. The results indicated that the initial standardised factor loadings of 2 items from Learning Styles' Practical (i.e., PRC1, PRC6), 1 item from Reading and writing (REW1) and 1 items from Left-Brain dominance (RED10) were below the cut-off 0.6. Therefore, these items were removed from the model. However, their removal did not significantly change the content of the constructs as they are conceptualized.

Convergent Validity

Table 2 presents the results of convergent validity and discriminant validity of each construct, using SMART-PLS 2.00.

Table 2: Convergent Validity for Learning Styles

Construct	Average Variance Extracted (AVE)[a]	Composite Reliability (CR)[b]	Internal Reliability Cronbach Alpha
Visual (VIS)	0.716	0.953	0.943
Auditory (AUD)	0.739	0.958	0.949
Reading-Writing (REW)	0.657	0.950	0.942
Practical (PRC)	0.676	0.949	0.940

Table 2 shows that the AVE of Learning Style, which reflects the overall amount of variance in the indicators accounted for by the latent construct, ranged from 0.65 to 0.73, above the cut-off point of 0.5, indicating that the construct explains more than half of the variance of the indicator (Hair, Hult, Ringle & Sarstedt, 2017). The composite reliability values ranged from 0.94 to 0.95, exceeding the recommended value of 0.6 for all constructs. The Cronbach's Alpha values ranged from 0.93 to 0.94 that were above the threshold of 0.7. Therefore, the Cronbach's Alpha value achieved for all constructs was considered as sufficiently error-free.

Table 3: Convergent Validity for Left and Right-brain Dominance

Construct	Average Variance Extracted (AVE)[a]	Composite Reliability (CR)[b]	Internal Reliability Cronbach Alpha
Left-brain dominance	0.575	0.928	0.912
Right-brain dominance	0.616	0.938	0.926

Table 3 shows that the AVE of Left and Right-brain Dominance, which reflects the overall amount of variance in the indicators accounted for by the latent construct, attained a score of 0.575 for Left-brain Dominance and 0.616 for Right-brain Dominance, above the cut-off point of 0.5, indicating that the construct explains more than half of the variance of the indicator (Hair et al., 2017: p.115). The composite reliability values for Left-brain Dominance was r. = 0.928 while for Right-brain Dominance, it was r. = 0.938; both exceeded the recommended value of r. = 0.6 for all constructs. The Cronbach's Alpha values for Left-brain Dominance and for Right-brain Dominance were 0.912 and 0.926 respectively that were above the threshold of 0.7. Therefore, the Cronbach's Alpha value achieved for all constructs was considered as sufficiently error-free.

Discriminant Validity

Table 4: Results of Discriminant Validity

	MIN	LSY	LBD	RBD	JLR
Learning Style (LSY)	0.194	**0.775**			
Left Brain Dominant (LBD)	0.206	0.229	**0.919**		
Right Brain Dominant (RBD)	0.235	0.324	0.518	**0.905**	
Japanese Language Result (JLR)	0.245	0.167	0.299	0.315	**1.000**

Note: Diagonals represent the square root of the average variance extracted while the other entries represent the correlations.

As shown in Table 4, the inter-correlations between the constructs ranged from 0.167 (correlation between Learning Style and Japanese Language Result) to 0.518 (correlation between Left-brain Dominance and Right-brain Dominance), which were below the threshold value of 0.85. The correlations were less than the square root of the average variance extracted by the indicators, demonstrating good discriminant validity between these factors (Kline 2005).

Assessment of structural model

Hypothesis 1 Left-brain Dominance Mediates the Relationship between Learning Styles and Japanese Language Academic Achievement

Table 5 presents the mediation effects of Left Brain Dominance on the relationship between Learning Styles and Japanese Language Academic Achievement.

Table 05: The Mediation Effects of Left Brain Dominant (LBD)

DV = Japanese Language Academic Achievement (JLAA)	**Independent Variable (IV)**
M = Left Brain Dominant (LBD)	**Learning Style (LSY)**
Total Effect of IV on DV without M (path a)	.124$^{*(sig:0.017)}$
Direct Effect of IV on DV with M (path a')	.076$^{(sig:0.130)}$
Indirect Effect of IV on DV through M (path bc)	0.048***
Effect of IV on M (path b)	.197$^{***(sig:0.000)}$
Effect of M on DV (path c)	.245$^{***(sig:0.000)}$
Mediation Path	LSY→LDB→JLR
Mediation Effect	Yes
Degree of Mediation	Full
Hypothesis Result	H6.b) Supported

*p< 0.05, **p< 0.01, ***p< 0.001

Table 5 shows that the effects of Learning Style on Left-brain Dominance (path b) was statistically significant at 0.001 level, with the standardized effects of 0.197. The effects of Left-brain Dominance on Japanese Language Academic Achievement (path c) was statistically significant at 0.001 level with the standardized effects of 0.245. These results indicated that Left-brain Dominance mediates the relationship between Learning Style and Japanese Language Academic Achievement. The degree of mediation was full since the paths a, b and c were statistically significant even though path a' was insignificant. Therefore, hypothesis 1 was supported.

Hypothesis 2 Right-brain Dominance mediates the relationship between Learning Styles and Japanese Language Academic Achievement

Table 6 presents the mediation effects of Right-Brain Dominance on the relationship between Learning Styles and Japanese Language Academic Achievement.

Table 6: Mediation Effects of Right Brain Dominant (RBD)

DV = Japanese Language Academic Achievement	**Independent Variable**
M = Right Brain Dominant	**Learning Style**
Total Effect of IV on DV without M (path a)	.125*(sig:0.015)
Direct Effect of IV on DV with M (path a')	.050(sig:0.325)
Indirect Effect of IV on DV through M (path bc)	0.074***
Effect of IV on M (path b)	.289***(sig:0.000)
Effect of M on DV (path c)	.258***(sig:0.000)
Mediation Path	LSY→RDB→JLR
Mediation Effect	Yes
Degree of Mediation	Full
Hypothesis Result	H7.b) Supported

*p< 0.05, **p< 0.01, ***p< 0.001

Table 6 shows that the effects of Learning Styles on Right-brain Dominance (path b) was statistically significant at 0.001 level, with the standardized effects of 0.289. On the other hand, the effects of Right-brain Dominant on Japanese Language Academic Achievement (path c) was statistically significant at 0.001 level with the standardized effects of 0.258. These results indicated that Right-brain Dominance mediates the relationship between Learning Style (LSY) and Japanese Language Academic Achievement. The degree of mediation was full since the paths a, b and c were statistically significant even though path a' was insignificant. The results revealed that Learning Styles had a significant indirect positive effect on Japanese Language

Academic Achievement through Right-brain Dominance with the standardized indirect effect of 0.074 significant at 0.001 level.

Discussion and Conclusion

The results showed that brain dominance mediates the relationship between Learning Styles and Japanese Language Academic Achievement. Chermahini, Ghanbari, and Talab (2013) investigated the relationship between Learning Styles and the academic performance of students who attended English class to learn English as a second language in Iran. They found that Learning Styles could be considered a good predictor of any second language academic performance. However, based on the findings in this study, it can be concluded that the effect of Learning Styles on foreign language learning varies for different countries or varies according to the language being learnt per se. In Japanese language learning, the effect was weakened or dismissed by the existence of the mediator. The results indicate that learning styles could be changed or altered by the orientation of the brain.

However, as learning involves all senses, particularly the ears and eyes, it leads to the positive effects of learning styles and Right-brain and Left-brain Dominance. Carmazzi (2015) claimed that the environment acts on the foundations of the brain to create a ranking of external motivators. Therefore, the input from the environment subsequently influences the learning styles and brain dominance. Sperry suggested that language is controlled by the left-side of the brain. Generally speaking, the left side of the brain tends to control many aspects of language and logic, while the right side tends to handle spatial information and visual comprehension. Later research found that the left and right brain work together, and that the thought is not dichotomous. In fact, research has shown that abilities in subjects such as maths are strongest when both halves of the brain work together (https://www.verywell.com/left-brain-vs-right-brain-2795005). Today, neuroscientists have proven that the two hemispheres of the brain collaborate to perform meaningful tasks. These two hemispheres communicate through the corpus callosum. The left hemisphere specializes in picking out the sounds that form words and working out the syntax of the phrase, but it does not have a monopoly on language processing whereas the right hemisphere is more sensitive to the emotional features of language, tuning-in to the slow rhythms of speech that carry intonation and stress (Carl Zimmer, 2009).

A study was carried out by researchers at the University of Utah with more than one thousand participants who had their brains analysed to determine the preference of using which side of the brain. The study revealed that the usage of both sides of the brain were essentially equal in their activity on average. However, the activity was sometimes higher in certain critical regions. In short, people do not tend to have a stronger left or right-sided brain network. It seems to be determined more in terms of connection. In reference to the general functions of the left and right brain, understanding the strengths and weaknesses in certain areas equips the educators with more alternative in designing the teaching and learning activities and develop better ways to learn and study. For example, students who have a difficult time following verbal

instructions (often cited as a right-brain characteristic) might benefit from writing down directions and developing better organizational skills.

Additionally, it was also revealed in this study that visual, auditory, reading, writing, and practical learning styles are indicators of Learning Styles in Japanese language learning. However, these Learning Styles do not significantly influence a student's Japanese language academic achievement due to its weak effect i.e. 0.041 in terms of its relationship strength. Therefore, Japanese language educators should only allocate resources and Learning Styles as supplementary strategies after Multiple Intelligences have been used to teach the students. In addition, mediators affect Learning Styles. The Left-brain and Right-brain Dominance has an impact on individuals' learning styles whereby the activities in the brain halves could overtake Japanese language learning.

Evidently, foreign language teaching and learning are the composition of all types of teaching strategies that involve multiple learning processes and methods. An effective teaching methodology that considers the student's intelligence is essential to ensure the effectiveness of the teaching and learning process and to enhance personal ability and confidence that elicits the internal motivation to learn the language. The findings suggest that there are other factors that affect Japanese Language Academic Achievement. Therefore, Japanese language educators should consider the other factors when teaching foreign language and doing research in this area in the future. Motivation, curriculum, first language, language aptitude and many others are factors that have not been addressed in this research; In any case, the consideration of the strategies of Multiple Intelligences, Learning Styles, Left-brain and Right-brain learning strategies would enhance the results of Japanese Language Academic Achievement.

A study on teachers' teaching strategies and students learning styles in teaching a foreign language is recommended as a way to explore the relationship between the teacher's strategies and foreign language Academic Achievement so that effective teaching and learning strategies that take into account both teachers and students' learning styles can be proposed.

In summary, the findings of the study serve as an explicit instruction on teaching and learning strategies that can help students learn actively and consciously. This approach may have a positive impact on both academic performance and classroom management by emphasising that students are in charge of their learning preference. In relation to teaching and learning, discovering learning styles is the key factor to develop knowledge and the ability to apply knowledge in education. However, the application of knowledge depends on an individual's interpretation of it. By knowing the cognitive process of learning, the curriculum can be designed in a way that supports all styles of learning.

References

Nunnally, J.C. and Bernstein, I.H. (1994) *Psychometric Theory*, McGraw-Hill, New York.

Bollinger L. (2013). The need for diversity in higher education. *Acad Med*.78:431–6.

Chermahini, S. A., Ghanbari, A., & Talab, M. G. (2013). Learning styles and academic performance of students in English as a second-language class in Iran. *Bulgarian Journal of Science and Education Policy*, 7(2), 322.

Duman, B. (2010). The effects of brain-based learning on the academic achievement of students with different learning styles. *Educational Sciences: Theory and Practice*, 10(4), 2077-2103.

Fazeli, S. H. (2011). The Relationship between the neuroticism trait and use of the English Language learning strategies. *International Journal of Linguistics*, 3(1), 1–14. doi:10.5296/ijl.v3i1.963.

Fleming, N. (2012). Facts, Fallicies and Myths; Vark & Learning Preferences. Retrieved 10 November 2014 from http://vark-learn.com/wp-content/uploads/2014/08/Some-Facts-About-VARK.pdf.

Fleming, N. and Baume, D. (2006) Learning Styles Again: VARKing Up the Right Tree! *Educational Developments, SEDA*. 4-7.

Hair Jr, J. F., Hult, G. T. M., Ringle, C., & Sarstedt, M. (2017). *A Primer on Partial Least Squares Structural Equation Modelling (PLS-SEM)*. Sage Publications.

Kane, N., & Kane, M. (1979). Comparison of Right & Left Hemisphere Functions. *Gifted Child Quarterly*, 23(1), 157-167.

Kline, R. B. (2010). *Principles and practice of structural equation modelling*: The Guilford Press.

Lightbown, P. M., & Spada, N. (2013). *How languages are learned. 4th edition-Oxford Handbooks for Language Teachers*. USA: Oxford University Press.

Previc, F. H. (1991). A general theory concerning the prenatal origins of cerebral lateralization in humans. *Psychological review*, 98(3), 299.

Sinatra, R. (1983). Brain research sheds light on language learning. *Educational Leadership*, 40(8), 9-12.

Wade, Carole and Tavris, Carole (2012). *Invitation to Psychology fifth edition*. Pearson Prentice Hall: USA.

Young, A. (Ed.). (2012). *Functions of the Right Cerebral Hemisphere*. Elsevier.
https://www.verywell.com/left-brain-vs-right-brain-2795005. Retrieved on 15 January 2014
http://www.HBDI.com. Retrieved on 15 January 2014

Exploring the University Student Experience

Jesus Alcoba, PhD
Graduate School of Business
Centro Superior de Estudios Universitarios La Salle, Spain

Susan Mostajo, PhD, RGC, RPsy
Human Resource Management Office
De La Salle University-Dasmariñas, Philippines

Olivia Legaspi, EdD
Faculty, Professional Education Department, College of Education
De La Salle University-Dasmariñas, Philippines

Romano Angelico Ebron, MAEc
College of Business Administration and Accountancy
De La Salle University-Dasmariñas, Philippines

Rowell Paras, DBM
Training and Development Office
De La Salle University-Dasmariñas, Philippines

ABSTRACT

Experience design is not a common concept in the education industry. A few attempts have been tried in the area of learner's experience design for teaching-learning experience enhancement. The current study, however, delved on the application of this concept in a larger scope by exploring the university student experience specifically at De La Salle University-Dasmariñas (DLSU-D) in Cavite, Philippines. This descriptive research utilized a questionnaire that was answered online by the students through their portal accounts. Data were statistically treated through frequency count, percentage, mean, and standard deviation. Results revealed consistency between the students' description of their University experience and the values they are developing in the institution. Moreover, students viewed that the University prioritizes cognitive and psychomotor learning than affective learning. These results are useful inputs in reviewing policies and academic-related services for quality improvement, and to ensure that students have a meaningful university experience as they prepare for their future professions.

Keywords: Experience design, Student experience, University experience, Quality of service, Academic-related services

Introduction

Quality reflects the value of service that is the foundation of the institution's worth and image as perceived by clients in the industry (Alcoba et al., 2017). The quality of service of institutions of higher learning has been often determined through the performance of its teachers and students. University administrators to determine the caliber of the institution and have been considered in the students' choice of a college or university where to acquire a degree or profession have used proofs of quality and competitiveness such as performance in competitions, licensure examinations, research, awards and recognitions. That is because people exchange their money, time or effort for that which provides them with value. The key issue is that what people consider valuable has recently undergone a significant evolution, accompanied by a switch from quality of service to quality of experience. The idea evolved from what was originally named as service systems science (Spohrer, Maglio, Bailey, & Gruhl, 2007), now simply called service science. This explains the co-creation of value as not only created and delivered by organizations but co-created among them and their clients (Spohrer & Maglio, 2008; Maglio, Vargo, Caswell, & Spohrer, 2009). This moves to a service dominant logic – a marketing issue which framework progressively expanded into having the institutional environment as a context of cooperation and coordination in value creation (Vargo & Lusch, 2004, 2007 and 2015). Later on, to a third concept that conceptualizes what is valuable for the customers related to Pine and Gilmore's (1998) explanation of the progression of economic value. Under this approach, experiences are placed beyond the interaction with services.

Among all the stated frameworks, a new consideration of value exchange arises, in which customer experience is pivotal. From this perspective, the value that customers seek nowadays exceeds the classic values of price and quality, and it is defined by the search for authentic and memorable experiences that can be integrated in their biography, thus contributing to define their identity. In addition, due to the subjective nature of human experiences, the customers seek to co-create the value along with the brand, in a equal and not unidirectional dialogue, as it has been traditionally happening. Therefore, in order to match the current trend in the co-creation of experiential value, it is vital that higher education institutions delve more deeply on how students live the university experience, thus facilitating a design that fulfils their expectations. This framework suggests the importance of getting feedback from students relative to their experiences as basis in enhancing the institutions' services that can add value on how people view the university as a learning institution, thus co-creation happens.

According to Diller et al. (2008), experience is generally defined as a conscious feeling of change in the interior of the human being such as his context, his body, his mind or his spirit. Hence, experience is something that occurs daily, although some experiences are ostensible while others are more profound and sensible. As Coxon detailed (2015), the term can have three different meanings, depending on the degree of superficiality or depth: a personal experience, an unnoticed daily experience, or the cumulative sum of the experiences that a person has, which contributes to his life experience. Additionally, experiences can be random events but can also be experiences deliberately designed to produce an effect, such as services. Services are generally organized around its customers' needs (Bharath et al., 2017). In business operation, the customers are the focus activity of the company's marketing orientation and it is

crucial to know their needs in order to achieve an optimal combination of both: the production factors and the disposal of products (Ilieska, 2013). With respect to educational institutions, services are often intangible and are difficult to measure because they result in the form of transformation of knowledge, life skills and behavior modifications of learners (Tsinidou et al., 2010). From such perspective, outcomes of educational services to students cannot be measured right away until when performances are available. Parallel to the value of product and services in general, customer service regardless of the type of industry has strategic importance (Dean and Terziovski, 2000) and requires companies to continually enhance customer experience and satisfaction, to deliver quality in a competitive marketplace (Schneider and Bowen, 1999) and to create a good customer experience.

Customer experience is a "multidimensional construct focusing on a customer's cognitive, emotional, behavioral, sensorial, and social responses to a firm's offerings during the customer's entire purchase journey" (Lemon and Verhoef, 2016). In the case of the health sector the specific term is "patient experience", a concept that explains "the sum of all interactions, shaped by an organization's culture, that influences patient perceptions, across the continuum of care" (Wolf et al., 2014). Similarly, in the field of education there is a "student experience" that can be conceived as the general perception that each student captures as a result of the sum of the interactions with a particular educational institution. The central aspect of this idea is that, similar to what happens in other sectors, students will (or will not) perceive value in their overall experience derived from all the interactions, rather than in specific aspects like the program or the facilities, therefore seeking for personal and memorable life events to add to their biographies and identities. For example, part of the identified factors that contribute to people's choice of a school are safe and friendly learning environment as well as student life and activities (Agrey and Lampadan, 2014) which in a deeper analysis are services that contribute to the students' experiences in a school. Furthermore, Coates and Naylor (2017) mentioned students' view of their experience in higher education to encompass three qualities: (a) value which reflects the worth of the higher education relative to cost, time and effort; (b) belonging which refers to student engagement or support and participation to the educationally purposeful practices of the institution; and (c) identity which encompasses the opportunity offered by the institution as regards the formation of identity as individuals and/or as a member of the community). The aforementioned students' views significantly reflects the notion that experiences are personal and memorable which may become part of the customers' biographies, and eventually aid them to construct their identities (Alcoba et al., 2016). The essence of this concept to the current study is the students' construction of meaning of their experiences in the university that may eventually become part of their own values and identity, hence the concept of experience design.

Experience design is an evolving concept pertaining to customer experience management (Alcoba et al., 2016). It is based on two pillars – the set of ideas and values that a specific institution intends to convey to the community, and the knowledge or perception of the clients (students) about the institution. Its fundamental characteristic is the creation of points of contact or touch points that truly shape and give value to the experience that the clients associate with the brand or the institution. If the customer's perception regarding the brand meaning will be unified and consistent, it leads to a unique, strong brand experience that will

promote a tighter relationship or emotional bond between consumers and the company (Newbery and Farnham, 2013).

With the establishment of the higher education market as a global phenomenon, higher education institutions (HEIs) have started to utilize the improvement of their service quality as a strategic tool in their efforts to attract students (Brochado, 2009). The instruments for gathering information in the university sphere have mainly focused on quality assurance (Alcoba, 2012) and therefore, there is a need for instruments in order to broaden that vision with the aim of collecting insights that can explain the general perception of the student. Thus, student experience has become an emerging important strategic competitive factor for higher education providers (McInnis, 2004; Mok, 2007) and the need for a more detailed understanding of the quality of the student experience has become essential. Consequently, administrators of educational institutions should reflect on how to ascertain that the university responds to the needs of its learners in terms of competency acquisition, and to ensure that students have a meaningful university experience as they prepare for their future professions. This study contributes to that purpose.

Research Objective

The study aimed to explore the university student experience as inputs to the improvement of academic-related services and policy review, where the following areas are covered:

1. value factors influencing students' decision to study at DLSU-D;
2. learning domains;
3. teaching methodologies;
4. student-learning assessments;
5. academic advising;
6. academic-related situations affecting students' wellness; and
7. students' description of their University experience.

This study is an attempt to present the students experience based on their general perception or opinion of the identified areas without mentioning any specific services offered by the University.

Conceptual Framework

Corresponding to the research objective, the researchers conceptualized a framework as shown in Figure 1. This framework was anchored from the model of Alcoba et al. (2016) which was built from the work of Newbery and Farnham in 2013 regarding experience design used in business industry. The framework of the current study displays the process of experience design applied to educational institution, in this case, the student experience.

The process starts from the value proposition of how customers (the students) perceive the university as an institution of learning where they will acquire formation necessary as future professionals. These values contribute to or influence the students' decision to obtain a degree from the university. The second phase is the actual engagement of the students with the

university. This means that the students have already enrolled and are experiencing the services provided by the institution. It is in this phase where students give meaning to their experiences which could either be favorable or not, and/or have met their expectations of the university or not, depending on how they put meaning to the services provided. The next phase is the exploration of the university student experience that is the focus of the current study. This phase is very important because the results are vital inputs for the review and improvement of the institution's academic-related services and policies. It is also in this phase that the students' description of their university experience, the values they are developing in the institution, and some other relevant factors are considered. The value of this research lies on providing recommendations for the review and improvement of the university's academic-related services and policies.

Figure 1. Student Experience Design Framework

Methodology

This descriptive quantitative research with purposive quota sampling technique utilized a questionnaire adapted from the work of Alcoba (2012) used in Centro Superior de Studios Universitarios La Salle, Madrid, Spain to analyze the university experience of the students at De La Salle University-Dasmariñas (DLSU-D) in Cavite, Philippines. The instrument was modified and tailored to a Philippine setting and orientation in general, DLSU-D in particular which experts further validated. The questionnaire contained words and statements pertaining to several university academic-related services that affect the learning and development of the students and reflect the students' overall perception of the university according to how they create meaning on them. The students were asked to rate their level of affirmation through a 4-point Likert scale, 1 being the lowest and 4 as the highest. The analysis was limited to the students' responses from the researcher-provided choices in the questionnaire. The questionnaire was answered online by 1,489 students in the tertiary level that is about 21% of the total population for school year 2017-2018 through their portal accounts. Data were statistically treated through frequency count, percentage, mean, and standard deviation. The verbal interpretation (VI) of scores are as follows: 1 - 1.49 (Strongly Disagree); 1.5 - 2.49 (Disagree); 2.50 - 3.49 (Agree); and 3.5 - 4.0 (Strongly Agree).

Results and Discussion

1. Value factors influencing students' decision to study at DLSU-D

Table 1. Values influencing students' decision to study at DLSU-D

Items	Mean	SD	VI
Functional Value: The acquired knowledge permits you to practice a profession.	3.27	0.71	Agree
Economic Value: Acquiring your degree makes you earn money.	3.19	0.76	Agree
Identity Value: Studying at DLSU-D allows you to develop your identity.	3.14	0.84	Agree
Emotional Value: The university life allows you to express your emotions and connect with those of others.	2.98	0.88	Agree

As shown in Table 1, students considered functional value as most influential to their decision to study at DLSU-D followed by economic value and identity value, with emotional value as the least. This result implies that the students believed that the knowledge and competencies they will acquire from the University will be helpful to them in the practice of their profession or chosen fields, which will eventually earn them money and make them productive. This finding is congruent with other researches supporting the importance of both functional and economic values in choosing a university where to earn a degree. For instance, Agrey and Lampadan (2014) found that job prospects or a desire to a degree program that leads to good job prospects upon completion together with learning environment ranked first among the five identified factors that affected students' selection of a university. The other identified factors were student life and activities, support system such as guidance and counselling office and scholarships, safe and friendly environment, and sporting facilities that ranked as second, third, fourth and fifth respectively. Likewise, degree benefit and career preparation accompanied by school characteristics, influencer, financial support, environment, facilities, family support, aspirations, cost, and media were concluded by Lee and Chatfield (2011) as factors to affect college choice. The same authors mentioned that status-attainment models assumed a utilitarian decision-making process that students go through in choosing a college, specifying a variety of social and individual factors leading to occupational and educational aspirations. This is similar to the economic models focus on the econometric assumptions that prospective college students think rationally and make careful cost-benefit analyses when choosing a college (Hossler et al., 1999). This is confirmed by Foskett and Hemsley-Brown (2001) whose research found that students considered more carefully economic factors in times of distress and financial difficulty. These factors included job opportunities to supplement their incomes, accommodation costs and family home proximity.

It is noticeable, however, that the differences of the mean scores in this research are minimal, which imply that the four values are all considered by the students in making DLSU-D as their college of choice. However, topping the list is the functional value.

2. Learning domains

Table 2. Learning Domains

Rank	Items	Number of Responses	Percentage
1	Learning by Knowing (Cognitive)	728	48.89%
2	Learning by Doing (Psychomotor)	537	36.06%
3	Learning by Being (Affective)	224	15.04%

For the data in Table 2, the students were allowed to choose only one from the list, thus percentage was used to analyze the frequency of responses and then ranked from the most to the least number of responses.

It can be seen from this table that majority of the students perceived that DLSU-D prioritizes cognitive and psychomotor learning over affective learning. This is confirmed by Jones and Bartlette (2000) who claimed that the most commonly understood learning domain is cognitive learning which results from instruction. However, while it is true that learning begins in teaching concepts that is cognitive in nature, all the different domains of learning should be covered to ensure a balance in the learning of students. Sonmez (2017) found out that learning outcomes are not disconnected such that when an individual learns a cognitive behavior, s/he also learns other associated psychomotor, affective and intuitive behaviors. This is proven in his study where he obtained a high level of significance and positive correlation among the different domains of learning. Likewise, Khidzir et al. (2016) emphasized that each domain influences each other, although the results of his study revealed a weak relationship among all the domains of learning. In addition, the relationship among the cognitive, affective and psychomotor domains of learning was emphasized by Alcartado et al. (2017) when they proposed a DLSU-D model for service learning. The model shows that learning goes through a process that encompasses the cognitive, affective and psychomotor domains. In such manner, the Lasallian way of teaching minds, touching hearts and transforming lives are achieved. Thus, the different facets of learning become integrated which is necessary in the total learning and development of the students.

3. Teaching methodologies

Data regarding students' responses on teaching methodologies at DLSU-D are presented in Table 3. The study found out that generally, the students agreed that the teaching methodologies used by professors in the University are appropriate. This implies that the professors considered the readiness of the students and the nature of the topics in their choice of methods (Corpuz and Salandanan, 2015), hence the appropriateness of the methods used as perceived by the students. Specifically, students believed that the methods of teaching used by their professors in the classroom adequately serve to develop their professional abilities and required professional competencies, as well as improve their learning skills. This is the main reason for the appropriate choice of method, to serve as a vehicle for the attainment of the objectives set for the course (Salandanan, 2012). Since the courses taught by the professors aim to develop the expected graduate attributes, it is essential that the methods used will contribute to the development of the needed competencies of the students.

Table 3. Teaching methodologies

Items	Mean	SD	VI
The teaching methodologies of the professors develop my professional abilities.	3.05	0.76	Agree
The teaching methodologies of the professors develop the required competencies of my profession.	3.04	0.74	Agree
The teaching methodologies of the professors have improved my learning skills.	3.01	0.77	Agree
The teaching methodologies of the professors are participative.	2.98	0.77	Agree
The teaching methodologies of the professors are unique (Lasallian).	2.97	0.79	Agree
The teaching methodologies of the professors favour learning.	2.97	0.77	Agree
The teaching methodologies of the professors are adequate.	2.94	0.76	Agree

The students also claimed that the teaching methodologies of their professors are participative. This finding is very important because students learn better, when they are engaged or involved in the learning process. As emphasized by Corpuz and Salandanan (2015), the more intense the involvement of students, the better is their learning. In relation, the study conducted by Ganyaupfu (2013) demonstrated that teacher-student interactive method was the most effective teaching method, followed by student-centered method while the teacher-centered approach was the least effective. Thus, the author concluded that students build a better understanding of the main concepts effectively when they are engaged to solve problems during class activities.

4. Student-learning assessments

Table 4. Student-learning assessments

Items	Mean	SD	VI
The student-learning assessments complement the teaching methodology used in the classroom.	2.99	0.75	Agree
The student-learning assessments are outcomes-based.	2.97	0.79	Agree
The student-learning assessments adequately measure the competencies acquired by the students.	2.97	0.75	Agree
The student-learning assessments adequately reflect the learning of the students.	2.96	0.80	Agree

The results of this study as regards student-learning assessments in the university are summarized in Table 4. Students of DLSU-D claimed that the learning assessments used by their professors in the classroom complement their teaching methodologies and appropriately

measure the competencies they acquire. This implies that the faculty members of DLSU-D are knowledgeable about the proper use of assessment since this process is necessary to determine how an instructional objective is achieved (Salandanan, 2012). This further implies that the outcomes-based approach implemented in the University is quite effective since this allows the faculty members to convert the institutional learning outcomes, otherwise known as expected graduate attributes, into specific course learning outcomes. These course-learning outcomes equate to the competencies acquired by the students.

As discussed by Fisher (2018), the measurement of student learning through assessment is important because it provides useful feedback to both the instructors and the students about the extent to which students are successfully meeting course-learning objectives. Additionally, assessment is vital in the pedagogical design and/or approach to encourage teachers and curriculum planners to 'think like an assessor' before designing specific units and lessons to determine if students will attain the desired understandings (Grant and McTighe, 2005).

5. Academic advising

Table 5. Academic advising

Items	Mean	SD	VI
My academic adviser assists me to be a better student.	2.76	0.98	Agree
My academic adviser provides me with useful academic or administrative information.	2.72	0.96	Agree
My academic adviser has been a mediator in conflicts.	2.65	1.02	Agree
My academic adviser gives me support in personal issues that affect my University life.	2.52	1.03	Agree

The scores relative to academic advising as shown in Table 5 disclose that students considered their experience to this service favorable, which is also proven by the statement "My academic adviser assists me to be a better student" with the highest mean. This denotes that students like having an academic adviser who serves as a source of needed support not only for academic concerns but also for personal related issues.

In relation, the study of Pargett (2011) confirmed that there is a relationship between academic advising and student development as well as student satisfaction with college. It was further mentioned that students who have created a relationship with their assigned faculty advisor reported to have more satisfaction with their college experience and positively develop as a student. The more a student and his/her advisor discuss personal and school-related issues, career options, college policies, academic deadlines and study skills and tips, the more likely the student positively developed and had a higher level of satisfaction with college. Likewise, Young-Jones (2013) concluded that academic advising affects multiple factors that contribute to student success. Results of the study highlighted how higher education institutions can benefit from supporting academic advising programs. The same author stated that academic advising is one element of a student's academic journey that can be further developed as a tool to help him/her achieve educational and career goals while helping institutions to accomplish stated educational missions furthered it. Similarly, Mu and Fosnacht (2016) found out that

advising experiences have a positive relationship with students' grades and self-perceived learning gains. On the other hand, institutional advising climate is positively correlated with perceived learning gains.

Taking into account the results of the study along this area that are supported by other researches, it can be noted that providing an academic adviser is a good practice in the university since this creates a favorable impression among the students.

6. Academic-related situations affecting students' wellness

Table 6. Academic-related situations affecting students' wellness

Rank	Items	Mean	VI
1	Academic overloads (work, lectures, obligations, etc.)	3.13	Agree
2	Exhausting examinations	3.08	Agree
3	Awaiting for grades	3.00	Agree
4	To study for approval and not for learning	2.85	Agree
5	Lack of academic recognition (dissatisfied with the expected results/ grades)	2.83	Agree
6	Need of expansion of studies	2.75	Agree
7	Uncertainty regarding a future profession/work	2.73	Agree
8	Lack of communication with professors	2.73	Agree
9	Value of your professional competency	2.69	Agree
10	Academic exigencies: schedule of classes, equipment, change of residence, etc.	2.65	Agree
11	Lack of social recognition of your career	2.64	Agree
12	Problems in adapting to the group or classmates	2.53	Agree
13	Presenting works in class	2.53	Agree
14	Lack of communication with classmates	2.45	Agree

Table 6 presents the academic-related situations that affect the wellness of students. From the list, the top five situations that affected them are academic overloads, exhausting examinations, awaiting for grades, to study for approval and not for learning, and lack of academic recognition or when they are dissatisfied with the expected results/grades. These results denote personal academic concerns of students since they refer to loads, examinations and grades. On the other hand, the last five in the list are lack of communication with classmates, presenting works in class, problems in adapting to the group or classmates, lack of social recognition of the chosen career, and academic exigencies. These results pertain to social relationships that may mean that the students do not worry too much about their dealings with their classmates. This may imply that the students are confident in interacting with the other members of the class. These findings are important because the University can use them as bases in the creation and/or improvement of programs concerning students' wellness. Baldwin et al. (2017) support the need for interventions that facilitate enhanced college student development and well-being because of their practical and therapeutic benefits while Harrington (2016) and Miller et al. (2008) maintain that educational facilities are ideal settings for wellness promotion.

Additionally, wellness as discussed by Mostajo et al. (2018) should be applied holistically to various aspects of human development and experience both from an internal and an external perspective. Thus, facilitating the different wellness dimensions as service among students to address the factors that affect their wellness is important in order for them to obtain quality of life despite pressures and challenges in completing a degree. The guidance and counseling services may be used as a venue to respond to this concern. It has to be noted that the environment and the personal characteristics of learners play an important role in their academic success (Goddard, 2003). Thus, the school environment is expected to provide support and assistance to students for the accomplishment of their performance goals at school.

7. Students' description of their University experience

Table 7. Students' description of their University experience

Rank	Description	Frequency	Percentage
1	Responsibility	826	55.47%
2	Community	823	55.27%
3	Beauty	641	43.05%
4	Accomplishment	615	41.30%
5	Respect	608	40.83%
6	Balance	569	38.21%
7	Inspiration	531	35.66%
8	Connection	520	34.92%
9	Creativity	517	34.72%
10	Security	512	34.39%
11	Freedom	397	26.66%
12	Wonder	373	25.05%
13	Truth	261	17.53%
14	Relief	220	14.78%
15	Justice	117	7.86%

The words used by the students in describing their university experience are reflected in Table 7, arranged from the most to the least number of responses. The students were allowed to choose more than one from the list of words. It appeared that the top five words used by students to describe their experience at DLSU-D are responsibility, community, beauty, accomplishment, and respect. Data also revealed that more than fifty percent of the respondents have chosen responsibility and community. This affirms the strength of the University in developing its students to acquire the sense of responsibility to live not just for oneself but for others. Part of the students' training is exposure to several community service programs that are integrated in the curriculum and in most of the course syllabi, coined as service learning (Alcartado et. al., 2017). Through these activities, students learn to respect others and appreciate the beauty of sharing oneself towards a sense of accomplishment or fulfillment.

On the other hand, students perceived justice, relief, truth, wonder, and freedom as the last in the list to describe their University experience. These results may point to the fact that the

University's focus relative to social transformation is more on community service and less on socio-political issues that students may have attached to justice, relief, truth and freedom. This however should be further studied.

Conclusions

1. In choosing DLSU-D as their college of choice, students considered its functional, economic, identity, and emotional values. However, functional value was considered as the top factor by the students.

2. Students perceived that the University is likely to focus more on cognitive and psychomotor learning over affective learning.

3. Students agreed that the teaching methodologies used by the professors develop their professional abilities and required competencies.

4. Students believed that the learning assessments used by the professors are consistent with their expectations in acquiring the competencies of their future professions.

5. Students considered academic advising as a good practice in the University wherein their advisers became the source of the much needed assistance and support in dealing with academic and personal concerns.

6. Students' wellness is generally affected by academic-related concerns that are personal in nature which refer to loads, examinations and grades.

7. Students described their experience at DLSU-D with the following words: responsibility, community, beauty, accomplishment, and respect. These words, especially responsibility and community, are normally associated with community service which is the focus of the social transformation efforts of the University.

Recommendations

1. Further studies should be carried out to frame the student experience design as a means of analyzing the students' motivation to study in a university.

2. DLSU-D professors should ensure that all the different domains of learning are considered in their teaching for a more integrated development of their students.

3. The teaching methodologies and student-learning assessments being used by the DLSU-D professors should be sustained to continuously develop the required competencies needed by their students to practice their future professions.

4. Academic advising as a service to students and as a good practice in the University should be continued due to the benefits it brings to students.

5. Intervention programs to ensure the wellness of the students during their stay in the University should be planned and implemented for a more meaningful university student experience.

6. The results of this study may be used by the University to review its practices and policies with regard to academic-related services to the students for quality improvement.

7. Future researches using a different methodology and a larger sample of students may be done to totally capture the real perception of students on their university experience.

Acknowledgements

The authors are thankful to Dr. Gabriel Flores for translating the Spanish questionnaire in English.

References

Alcartado, P., Camarse, M., Legaspi, O., Mostajo, S. and Buenaventura, L.C. (2017). Developing pedagogical model of service learning: The De La Salle University-Dasmarinas experience. Journal of Institutional Research for South East Asia 15 (2), 31-56.

Alcoba, J. (2012). The meaning of the university experience: A service science approach. In Exploring Services Science (pp. 340-349). Springer, Berlin, Heidelberg. https://doi.org/10.1007/978-3-642-28227-0_26

Alcoba, J., Mostajo, S., Paras, R., and Ebron, R. A. (2017). Beyond quality of service: Exploring what tourists really value. In Exploring Services Science (pp. 261-271). Springer, Cham. https://doi.org/10.1007/978-3-319-56925-3_21

Alcoba, J., Mostajo, S., Paras, R., Mejia, G. C., and Ebron, R. A. (2016). Framing meaningful experiences toward a service science-based tourism experience design. In Exploring Services Science (pp. 129-140). Springer, Cham. https://doi.org/10.1007/978-3-319-32689-4_10

Agrey, L. and Lampadan, N. (2014). Determinant factors contributing to student choice in selecting a university. *Journal of Education and Human Development*, Vol. 3, No. 2, pp. 391-404.

Baldwin, B., Towler, K., Oliver, M., and Datta, S. (2017). An examination of college student wellness: A research and liberal arts perspective. *Health Psychology Open*, Vol. 4, No. 2: 2055102917719563. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC577921/

BharathVajan R., Kumar, S., and Srinivasan, V. (2017). A study on customer perception on services provided by Yashimarine Logistics, Ghennai. Retrieved from: *https://acadpubl.eu/jsi/2017-116-13-22/articles/14/86.pd*

Brochado, A. (2009). Comparing alternative instruments to measure service quality in higher education. *Quality Assurance in Education*, Vol. 17 No. 2, pp. 174-190.

Coates, H. and Naylor,R. (2017) New terspectives on the student experience. Retrieved from https://melbourne-cshe.unimelb.edu.au/__data/assets/pdf_file/0011/1862228/New-Perspectives-on-the-Student-Experience_240316_updated.pdf

Corpuz, B. and Salandanan, G. (2015). Principles of teaching 2 (with TLE). Quezon City: Lorimar Publishing, Inc.

Coxon, I. (2015). Fundamental aspects of human experience: A phenomenological explanation. En P. Benz (Ed.), Experience design: concepts and case studies. London; New York: Bloomsbury Academic.

Daly, A.J. and Barker, M.C. (2005). Australian and New Zealand university students' participation in international exchange programs. *Journal of Studies in International Education*, Vol. 9 No. 1, pp. 26-41.

Dean, A. and Terziovski, M. (2000). Quality practices and customer/supplier management in Australian service organizations: Untapped potential. Working Paper Series, Monash University Department of Management, Melbourne

Diller, S., Shedroff, N., and Rhea, D. (2008). Making meaning: How successful businesses deliver meaningful customer experiences. Berkeley: New Riders.

Fisher, Jr., M. (2018). Student assessment in teaching and learning. Retrieved form: https://cft.vanderbilt.edu/student-assessment-in-teaching-and-learning/

Foskett, N. and Hemsley-Brown, J. (2001), Choosing futures: Young people's decision making in education training and career markets. Routledge Falmer: London.

Ganyaupfu, E. M. (2013) Teaching methods and students' academic performance. *International Journal of Humanities and Social Science Invention*, ISSN (Online): 2319-7722, ISSN (Print): 2319-7714. www.ijhssi.org, vol. 2, Issue 9, pp29-35.

Goddard, R. D. (2003). Relational networks, social trust, and norms: A social capital perspective on students' chances of academic success. Educational Evaluations & Policy Analysis, 25, 59-74.

Grant, W. and McTighe, J. (2005). *Understanding by Design.* 2nd Expanded edition. Alexandria, VA: Assn. for Supervision & Curriculum Development, Print.

Harrington, S. (2016). America's healthiest campus: The OSU well-being strategy model. *American Journal of Health Promotion*, Vol. 30. No. 3: TAHP-4, doi: 10.4278/ajhp.30.3.tahp-2.

Hossler, D., Schmit, J., and Vesper, N. (1999). Going to college: How social, economic, and educational factors influence the decisions of students make. Baltimore: The John Hopkins University Press.

Huang, F. (2007). Internationalization of higher education in the developing and emerging countries: A focus on transnational higher education in Asia. *Journal of Studies in International Education*, Vol. 11 No. 3, pp. 421-432.

Ilieska, K. (2013). Customer satisfaction index – as a base for strategic marketing management. Retrieved from: www.temjournal.com

Jones, D., and Bartlette, A. (2000). The learning process. Jones and Bartlett Publishers.

Khidzir, N., Daud, K., and Ibrahim, M. (2016). The relationship among student's domain of learning development implementing virtual learning in higher learning institutions. *International Journal of Information and Education Technology*, Vol.6, No. 6, pp. 418-422. doi: 10.7763/IJIET.2016.V6.725

Lee, S. J. and Chatfield, H. K. (2011). The analysis of factors affecting choice of college: A case study of UNLV hotel college students. Retrieved from https://scholarworks.umass.edu/cgi/viewcontent.cgi?article=1228&content=gradconf_hospitality.

Lemon, K. N., and Verhoef, P. C. (2016). Understanding customer experience throughout the customer journey. *Journal of Marketing,* Vol. 80, No. 6, 69-96. https://doi.org/10.1509/jm.15.0420

Maglio, P. P., Vargo, S. L., Caswell, N., & Spohrer, J. (2009). The service system is the basic abstraction of service science. *Information Systems and E-Business Management*, *7*(4), 395-406. https://doi.org/10.1007/s10257-008-0105-1

Marginson, S. (2007). The public/private divide in higher education: A global revision. Higher Education, Vol. 53 No. 3, pp. 307-333.

McInnis, C. (2004). Studies of student life: An overview. *European Journal of Education*, Vol. 39, No. 4, pp. 383-394

Miller, D. N., Gilman, R., and Martens, M. P. (2008). Wellness promotion in the schools: Enhancing students' mental and physical health. *Psychology in the Schools* Vol. 45, pp. 5-15.

Mok, K.H. (2007). Questing for internationalization of universities in Asia: Critical reflections. *Journal of Studies in International Education*, Vol. 11, Nos 3/4, pp. 433-454.

Mostajo, S., Rasing, E. and Flores, R. (2018). A glimpse of the wellness and engagement of administrators from La Salle schools in the Philippines. *Journal of Institutional Research for South East Asia*, Vol. 16, No. 1, pp. 1-25. ISSN 1675-6061.

Mu, L. and Fosnacht (2016). Effective advising: How academic advising influences student learning outcomes in different institutional contexts. Paper presented at the annual meeting of the American Educational Research Association, Washington, DC, April 8, 2016.

Newbery P. and Farnham K. (2013). Experience design: A framework for integrating brand, experience, and value. John Wiley & Sons.

Pargett, K. (2011). The effects of academic advising on college student development in higher education. Educational Administration: Thesis, Dissertation, and Student Research, 81. http://digitalcommons.unl.edu/cehsedaddiss/81

Pine, B.J. and Gilmore, J.H. (1998). Welcome to the experience economy. Harvard Business Review, 76 (4), 97-105

Salandanan, G. (2012). Teaching and the teacher (Revised edition). Quezon City: Lorimar Publishing, Inc.

Schneider, B. and Bowen, D.E. (1999). Understanding customer delight and outrage. Sloan Management Review, Vol. 41 No. 1, pp. 35-46

Sonmez, V. (2017). Association of cognitive, affective, psychomotor and intuitve domains in education, Sonmez Model. Universal Journal of Educational Research, 5(3), pp. 347-356. doi: 10.13189/ujer.2017.050307. retrieved from http://www.hrpub.org

Spohrer, J. & Maglio, P. P. (2008). The Emergence of Service Science: Toward Systematic

Service Innovations to Accelerate Co-Creation of Value. *Production and Operations Management, 17*(3), 238-246. https://doi.org/10.3401/poms.1080.0027

Spohrer, J., Maglio, P. P., Bailey, J., & Gruhl, D. (2007). Steps Toward a Science of Service Systems. *Computer*, Vol. 40, No. 1, 71–77. https://doi.org/10.1109/MC.2007.33

Tsinidou, M., Gerogiannis, V., and Fitsilis, P. (2010). Evaluation of the factors that determine quality in higher education: An empirical study. Quality Assurance in Education, Vol. 18, No. 3, pp. 227-244

Vargo, S. L., & Lusch, R. F. (2004). Evolving to a New Dominant Logic for Marketing. *Journal of Marketing*, Vol. 68, No. 1, pp. 1-17. https://doi.org/10.1509/jmkg.68.1.1.24036

Vargo, S. L., & Lusch, R. F. (2007). Service-dominant logic: continuing the evolution. *Journal of the Academy of Marketing Science*, Vol. 36, No. 1, pp. 1-10. https://doi.org/10.1007/s11747-007-0069-6

Vargo, S. L., & Lusch, R. F. (2015). Institutions and axioms: an extension and update of service-dominant logic. *Journal of the Academy of Marketing Science*, Vol. 44, No. 1, pp. 5-23. https://doi.org/10.1007/s11747-015-0456-3

Wolf, J., Niederhauser, V., Marshburn, D., and LaVela, S. (2014). Defining patient experience. Patient Experience Journal, Vol. 1, No. 1, pp. 7-19.

Young-Jones, A., Burt, T., Dixon, S., Hawthorn, M. (2013) Academic advising: Does it really impact student success? Quality Assurance in Education, Vol. 21, No. 1, pp. 7-9. Retrieved from https://doi.org/10.1108/09684881311293034

The Reliability and Validity of Test Construction from Item Bank based on Item Response Theory

Suwimon Kritkharuehart

Department of Educational Evaluation and Research,
Faculty of Education, Ramkhamhaeng University, Bangkok, Thailand
(suwimon.k@rumail.ru.ac.th)

ABSTRACT

Item banks indicate the advancement of academic administration of educational institutions, in particular the test development that aims to produce more than one parallel test. The purpose of a parallel test is to make the scores of two certain tests equivalent, which renders the scores interchangeable. Furthermore, nowadays computers are able to produce parallel tests automatically. This research endeavoured to construct an Automated Test Assembly (ATA) programme from an item bank capable of producing tests, and to test the accuracy of the test assembly programme in regard to its test parallelism and test overlap rate. The data in this research were obtained from the simulation of test results in relation to the actual test results of 2,800 examinees. The statistical approaches used in this research were the followings: Exploratory Factor Analysis (EFA), 3-parameters Item Response Theory (3 PL-IRT), and Test Overlap Rate. The result of the research suggested that this programme was effectively capable of producing parallel tests, which were used to measure the academic performance of examinees in certain levels of ability. However, when stipulating some more conditions on achievement tests, which matched the various abilities of examinees, the programme became less effective in creating parallel tests. Moreover, some more conditions added on test overlap rate between each test resulted in the inaccuracy with respect to test parallelism. In short, the more added conditions of creating a test paper there were, the less ineffective in creating parallel tests the programme became. The result of this study contributed to the production of parallel tests provided by the ATA programme. The tests created were valid and reliable. Their reliability and validity were measured by the following criteria: their comprehensiveness of the domain of content, their test parallelism, which is one of the important characteristics of achievement tests, their interchangeability in each testing period, and their ability to prevent test leaks effectively.

Keywords: item bank, test assembly, parallel tests, 3-parameters IRT

Introduction

It is generally acknowledged that educational measurement and evaluation are two important processes which determine the success of tertiary education. This helps to create employable graduates who satisfy the requirements of the labor market. Universities should, therefore, acquire a systematic management to affect their educational measurement and evaluation with efficacy.

The three following components are essential for educational measurement and evaluation: items, tests, and examinations. As a result, item bank play a pivotal role in effectively administering educational tests with large scale testing in which each student takes the test more than one time (McAlpine, 2002). In addition, instructors can also select a test which matches the objectives of an examination. By means of using an item bank, which categories items into different groups with respect to their content, to produce more than one parallel test with content validity, tests can be used again with the same student without repeatedly using the same test. This also makes the interchangeability of each different test used at different times possible. According to IRT, the characteristic of the tests mentioned above identifies test parallelism. Moreover, computer programmes nowadays enable instructors to automatically produce parallel tests from item bank via stipulating conditions on a test, such as the amount of contents, the number of questions, the difficulty index and the discrimination index of the tests, which meet the objectives of an examination.

According to the result of numbers of research previously conducted, there were differences in the accuracy of the ATA programme. Lin (2008) investigated the accuracy of the ATA programme, which was developed from weighted deviations model (WDM) heuristic, that aimed to produce parallel tests. It was found that the programme was able to produce six tests with test parallelism, and the tests produced were capable of accurately predicting the scores of examinees in two levels of ability, i.e. being fairly high, and being high. In the light of Chen & Lei (2009), Lin (2010) conducted a further study in which the accuracy of the ATA programme was investigated by using the function that regulated test overlap rate. The study revealed that the ATA programme was capable of producing ten tests with test parallelism, and the tests produced were, with accuracy, capable of predicting the scores of students only in one level of ability– being moderate.

This study further investigated the application of the instruction set lp_Solve Version 5.5 of the R programme which was effective in selecting items due to its algorithm that solves mathematical problems under the two following principles: the principle of decision-making in selecting mathematical variables and the principle of the least aberration. According to van der Linden (2005), the study also stipulated certain conditions according to which items were randomly selected so as to produce tests in relation to the quantitative conditions in the test set level by determining the ratio of the lowest and the highest numbers of items in each content of measurement by using this equation: $\sum x_i \leq n_c^{max}$, $\sum_{i \in V_c} \geq n_c^{min}$. This also offered laypersons an opportunity to use the programme without infringing copyright and to examine the accuracy of the ATA programme developed from tests that have the capability for

estimating the scores of students in four levels of ability; namely, being quite low (θ = -1.50), being moderate (θ = 0.00) , being fairly high (θ = 1.50), and being high

(θ = 2.50). Therefore, the researcher had great interest on developing the ATA programme for producing tests from the item bank, and testing the accuracy of the programme in relation to its test parallelism and test overlap rate. The criterion for assessing the accuracy of the programme was whether the programme achieved the efficiency in producing tests capable of estimating the scores of students in four levels of ability – being quite low, being moderate, being fairly high, and being high. The findings in this research shall be beneficial to the production of parallel tests from the item bank which ensures the reliability of the estimation of the scores of students with the least aberration, and also with low test overlap rate, indicating that items are secured, and the prevention of test leak when each paper is used again.

Related Literature

Test design

Designing how students ought to learn that matches individual differences has become more and more common in educational institutions. Hence, item banks are considered indispensable for facilitating instructors when it comes to selecting items from an item bank so as to produce a test, which can be used differently in accordance with the aim of an examination. For example, the test can be used to measure and evaluate examinees' academic achievement, or to periodically keep track of examinees' learning progress, or to promote test enhanced learning, when using different tests in relation to learning objectives. It follows, therefore, that designing any test paper must aim to produce a test paper that possesses the ability to estimate the scores of examinees. As regards the discrimination of the type of test design, the two following theories are used: the Classical Test Theory (CTT) and the Item Response Theory (IRT). Designing tests with reference to the IRT is suitable for both measuring and evaluating academic achievement, periodically monitoring examinees' progress, and promoting test enhanced learning.

According to van der Linden (2005), using IRT for test design offers two advantages. First, tests are selected in regard to the probability that examinees would correctly choose the right answers. In other words, it is to select items suitable for the examinees' level of ability. Subsequently, the items will be collected and used as a test in order to measure and evaluate individual achievement. This is regarded as an effective implementation of information technology of item banks. Second, the scores of examinees examined by a parallel test paper, in which each item belonged to the different test papers, can be equated. This ensured the interchangeability of the test result. The process of developing the ATA programme from the item bank in order to produce a test paper comprises three stages:

(1) Designing the item bank. This stage involves determining the content which will be used in constructing the item bank. The number of the items will be enumerated in relation to each

sub-content on one condition: namely, the number of the items must be either equal to or ten times more than the number of the actual items. The following three parameters are used with reference to the objectives of the examination: difficulty, discrimination, and guessing.

(2) Developing the item bank. This stage deals with test writing, test reviewing and improving, and also test trialling and selecting IRT model for assessing the quality of a test. The IRT model consists of 1 PL-IRT, 2 PL-IRT, and 3 PL-IRT. 1 PL-IRT considers the difficulty parameter of items in order to produce a test which is suitable for the ability level of examinees. 2 PL-IRT considers the difficulty and discrimination parameters of items in order to produce a test which is suitable for the ability level of examinees. 3 PL- IRT considers the difficulty, discrimination, and guessing parameters of items in order to produce a test which is suitable for the ability level of examinees. The final step is assessing the quality of items and a test paper with regard to the selected model.

(3) Determining the characteristics of the test which needs to be produced. The characteristics consist of the number of sub-contents used in each item, the number of items enumerated in relation to sub-contents, the parameters of the paper, i.e. difficulty, discrimination, guessing, information function appertaining to the reference test, and test overlap rate.

Test Parallelism

According to McDonald (2009), in Item Response Theory Model, parallel measurements constitute a mathematical requirement that the items in parallel tests themselves matched item parameters – equal item means and loadings in the linear model or equal item parameters. In applications, it is expected that conditions will be stipulated on the substantive content of the items which compose each form and it is a condition for equity. Equity is the requirement that makes the administration of a form of test unknown to examinees. Any two forms will be item-parallel if they share the following features:

1. Equal test characteristic curves – obtained by summing the equated item characteristic curves;
2. Equal test information functions – obtained by summing equated item information function;
3. Equal test-score information functions (and, more generally, equal formula-score information functions).

As a result, the true scores and the error variances of the two forms also matched at every point on the scale of measurement.

Test Information Function

As stated by Baker (2001), the interest, in IRT, was on estimating the value of the ability parameter for an examinee. If the amount of information is adequate, the examinee whose true ability is at that level can be estimated with precision, i.e. all the estimates will be reasonably close to the true value. On the contrary, if the amount of information is inadequate, the ability of the examinee cannot be estimated with precision and the estimates will be widely scattered about the true ability. Furthermore, de Ayala (2009) stated that test information function might be used to design an instrument with specific characteristics.

This capacity takes advantage of the fact that items and persons are located on the same continuum as well as the capacity to assess the amount of information in order to estimate person locations solely based on the item parameter estimates. Success in developing an instrument whose observed total information function is similar to the target information function depends on having an adequate pool of items to work with and on imposing constraint on the item selection so as to ensure that the resultant instrument has validity with respect to the construct of interest. Moreover, any test paper with a high discrimination parameter and a low guessing parameter has a high information function parameter – its predictive ability of the scores of examinees is accurate.

Test overlap rate

Lin (2010) affirmed that test overlap control is important, and might probably be more crucial for automated test assembly (ATA). In the context of assembling equivalent test forms, the test overlap rate could be extremely high because the items selected to fulfill the constraints, for example, target test information function, are likely to be the same across multiple test forms without exposure control. One of the goals of the test assembly process should be the minimization of test overlap rate – the percentage of items shared between any two forms. In automated test assembly, one way to achieve this is to include item usage as another constraint or target in the solution of the assembly problem.

Generally, an item with a high discrimination parameter will have more item overlap rate than that with a lower discrimination parameter because a test with a high discrimination parameter will make the estimation of Item Characteristic Curve (ICC) accurate and suitable for the ability of an examinee (θ_p) which leads to higher Test Information Function (TIF) (Chang & Ying, 1996 as cited in Chang & Zhang, 2002). Way (1998 as cited in Chang & Zhang, 2002) maintained that the control of item exposure rates needs explicit research since the control of item exposure rates should consider both the aspects of rates of the item exposure and the determination of item bank. In addition, it is also suggested that the repetition of using random items should be less than 25%.

Methods

The Objectives

The major objective which this study aimed to achieve was to develop an automated test assembly (ATA) programme from an item bank in order to produce tests that show reliability and validity based on IRT. It also had four minor objectives: namely, first, developing the test assembly programme from an item bank; second, verifying the accuracy of the test assembly programme in respect of its test parallelism which depends on the referenced test; third, verifying the accuracy of the test assembly programme in respect of its low test overlap rate; and fourth, verifying the accuracy of the test assembly programme in respect of its parallelism and test overlap rate.

Participants

The participants in this study were a cohort of 2,800 second-year students who enrolled on the course "Introduction to Statistics and Research in Education" at Ramkhamhaeng University.

Procedure and data analysis

The development of the automated test assembly (ATA) from the item bank in order to produce tests that show reliability and validity based on IRT consists of two stages. The first stage is constructing and verifying the quality of the referenced test based on Classical Test Theory (CTT) and Item Response Theory (IRT). The second stage is constructing, verifying, and selecting items that show the desired qualities according to IRT in order to register them in the item bank.

Stage 1: Constructing and verifying the quality of the referenced test based on CTT and IRT

The referenced test was the test used in the course "Introduction to Statistics and Research in Education". The followings were the procedure of this stage:

(1) The table of specification of the test was constructed by three lecturers. It was found that the test consisted of 100 items with 8 contents. Its numbers of items were 9, 11, 9, 25, 11, 10, 19, 6, respectively;
(2) The test whose items had four multiple choices were produced;
(3) The content validity of the test was examined by five experts and the Index of Item Objective Congruence (IOC) was calculated by using Hambleton's formula (1984). It was found that the test had the index of IOC between 0.80 and 1.00
(4) The test was used by 2,800 students who enrolled on the course. It turned out that there were 64 items that showed the quality based on the CTT with the difficulty index between 0.20 and 0.80, the discrimination index calculated via the biserial correlation from 0.20 upwards, and the KR-20 reliability coefficient of 0.84.
(5) The quality of the items and the test was assessed by 3 PL- IRT. It was found that the referenced test with 64 test items showed the single dominant factor; namely, the ratio between the first eigenvalue and the second eigenvalue was 3.131 which satisfied Gorsuch's (2003) criteria, dictating that the ratio between the first eigenvalue and the second eigenvalue must not be lower than 3.000. Once the test had the single dominant factor, there would be test-answering independence (Hambleton & Swaminathan, 1996). By making model data fit assessment, it was found that the 3PL-IRT test correspondence model corresponded to the empirical data than the 2 PL- IRT test correspondence model with the statistical significance at 0.01; namely, $\chi^2_{\text{II}-\text{III}}$ = 171, 870. 5842 - 171, 273.6639
(6) = 596.9203, and $\chi^2_{0.01,64}$ = 95.6260.
(7) The analysis of the item and test parameters was performed. It was found that the discrimination index was between 0.206 and 3.272, the difficulty index was between (- 2.088) and 2.883, and the guessing index was between 0.001 and 0.315 which met Baker's (2001) and de Ayala's (2009) criteria.

(8) The analysis of the test information function was made. It was found that the referenced test showed a high degree of the assessment accuracy of examinees with moderate ability, followed by those with low ability and fairly high ability, respectively. The referenced test also showed the empirical reliability index of 0.88, suggesting that the referenced test was efficient in assessing the ability of examinees at 77.44%, as shown in Figure 1.

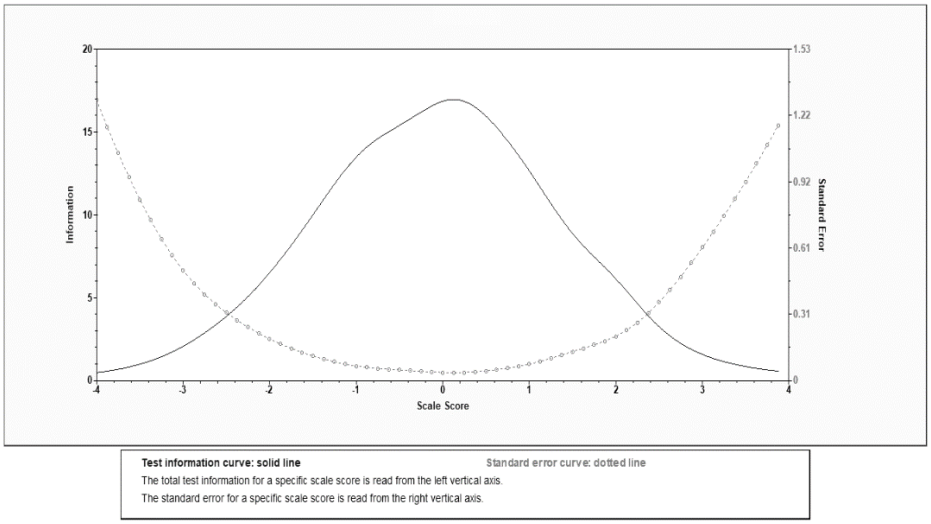


Figure 1 Test information function of referenced test

Stage 2: constructing, verifying, and selecting items which show the desired qualities according to IRT in order to register them in the item bank.

In order to construct, verify, and select items which display the desired qualities according to IRT, this study selected the items that had the difficulty, discrimination, and guessing indexes corresponding to the items in the referenced test by creating the item bank and the result of the test through the simulation programme called WINGEN (Han, 2007). According to van der Linden (2005), the number of the items in the item bank with reference to IRT was equal to or more than ten times of that of the actual items. Regarding the result of the verification and selection of the items in respect of 3PL-IRT, it was found that the simulated item bank had 2,089 test items, all of which had the difficulty index, the discrimination index, and guessing index corresponding to the referenced test, and every test measured the single dominant factor. The result indicated that this item bank had the desired quality with regard to the IRT. The statistical analyses in this stage were the followings: Exploratory Factor Analysis (EFA), Test Parallelism (Luecht, 1998; Chen, Chang, & Wu, 2012), Test Overlap Rate (Chen, Ankenmann & Spray, 2003).

Results

Automated Test Assembly Programme

The automated test assembly (ATA) programme was a modified form of the instruction set called lp_Solve Version 5.5 (Diol & van der Linden, 2013) in R programme. The multiple

assembled tests were created from the collection of the selected test items, as shown in Figure 2.

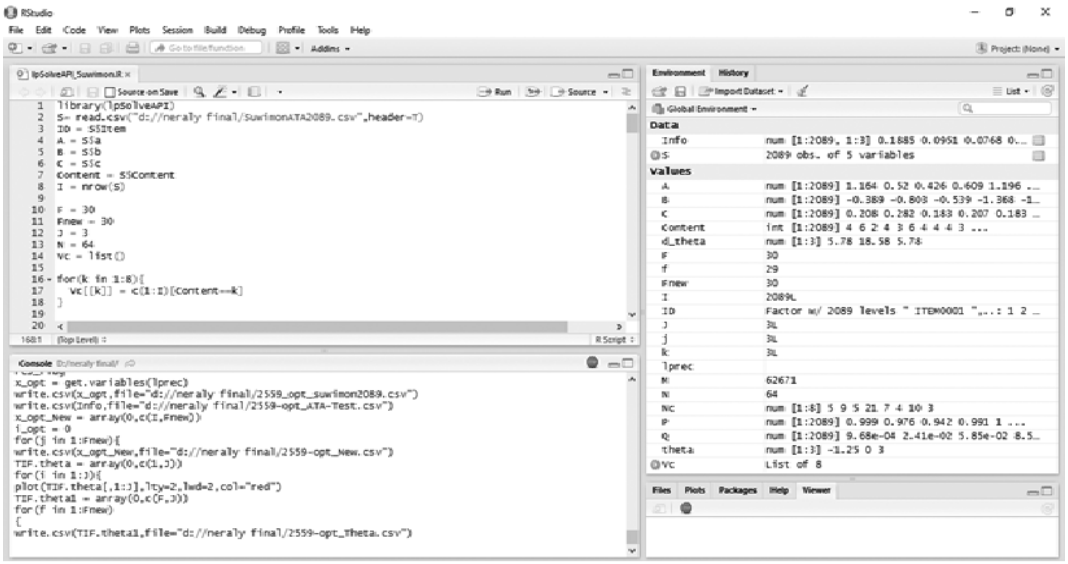


Figure 2 Automated Test assembly programme with R Program

The followings were the details about the ATA programme:

Part 1: Input determination

(1) Determine the specific characteristics of items so as to be collected and used in the test in accord with the referenced test; namely, the assembled test items included 8 contents, the numbers of which were 5, 9, 5, 21, 7, 4, 10, and 3, respectively, the number of tests to be created were 1 to 5 tests, and the number of items per test was 64.

(2) Determine the test information function of different referenced tests based on the ability of examinees ($RTIF_{\theta_k}$), which was further used as a criterion for collecting items so as to produce tests with test information function corresponding to that of the referenced test.

In this research, $RTIF_{\theta_k}$ resolved itself into three different cases: namely, first, the test information function of the referenced test of examinees with moderate ($RTIF_{\theta = 0.00} = 16.80$) and fairly high ability ($RTIF_{\theta = 1.50} = 10.00$); second, the test information function of the referenced test of examinees with quite low ($RTIF_{\theta = (-1.50)} = 10.50$), moderate ($RTIF_{\theta = 0.00} = 16.80$), and fairly high ($RTIF_{\theta = 1.50} = 10.00$); and third, the test information function of the referenced test of examinees with quite low ($RTIF_{\theta = (-1.50)} = 10.50$), moderate ($RTIF_{\theta = 0.00} = 16.80$), fairly high ($RTIF_{\theta = 1.50} = 10.00$), and high ability ($RTIF_{\theta = 2.50} = 5.00$).

Part 2: Procedures and mandatory conditions

(1) Design a decision-making instruction set for selecting items from the item bank which were used in the test which showed binomial distribution:

(2) $x_{it} = \begin{cases} 1 \text{ when the item(i)appeared in the test (t)} \\ 0 \text{ when the item (i) did not appear in the test (t)} \end{cases}$

(3) The instruction set of mandatory conditions of lp_Solve Version 5.5 was created in order to select test items from the item bank and calculate the item information function (IIF), and then calculate the total IIF selected from the programme, which indicated different item information functions in regard to the ability of examinees at k levels, when k = 1, …, K; namely, Test Information Function (TIF_{θ_K}). The test whose items were selected from the item bank ought to have the least different test information function corresponding to the ability of examinees from that of the referenced test ($RTIF_{\theta_K}$).

(4) The instruction set of mandatory conditions for randomly selecting test items was created so as to prevent using the items repeatedly among tests.

(5) The instruction set of how items would be randomly selected was created in order to produce multiple tests with reference to the structure of the referenced test content.

Part 3: The results of procedures and mandatory conditions

(1) The results of test items selected from the item bank to be used in multiple tests. x_{it} = 0 means the item was not selected from the item bank in regard to the mandatory conditions, whilst x_{it}= 1 means the item was selected from the item bank in regard to the mandatory conditions, as shown in Figure 3.

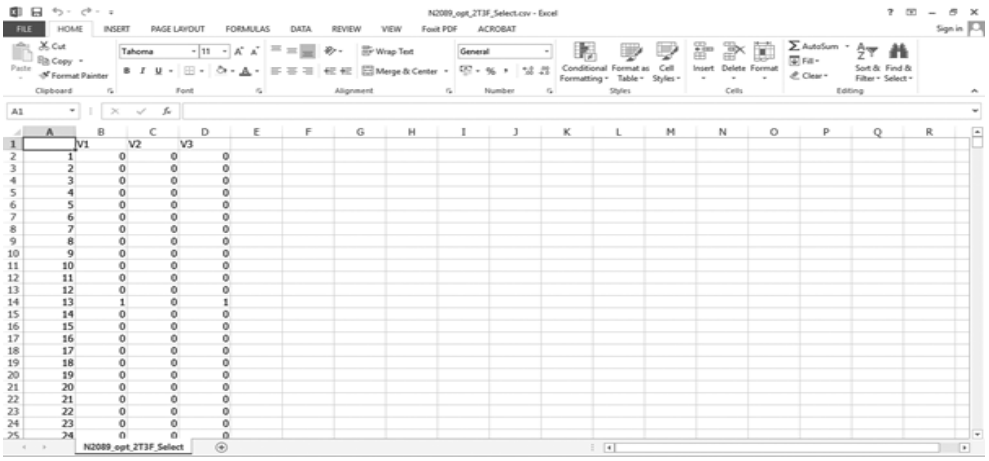
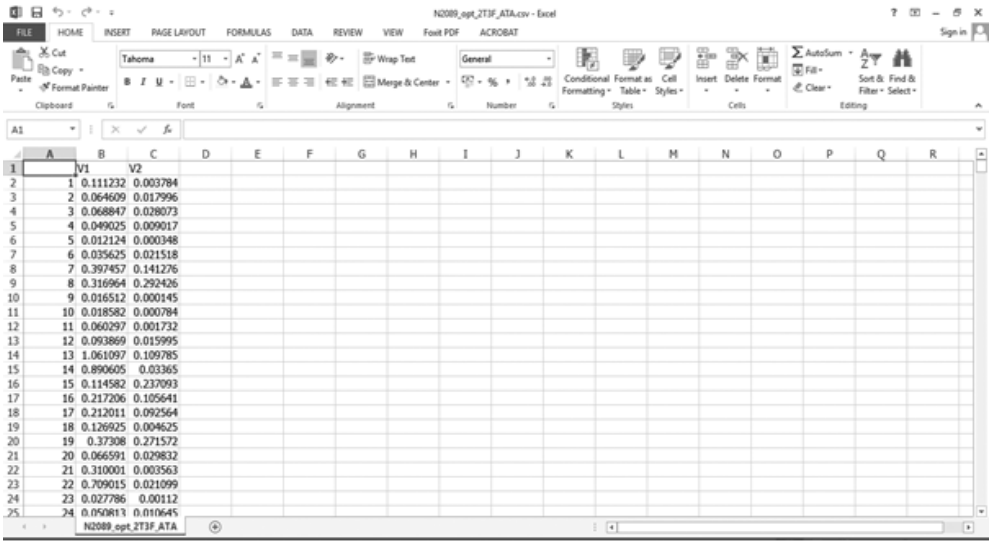


Figure 3 Output of item selection program of item bank

(2) The results of the assembled tests had the Assembled Test Information Function ($ATIF_{\theta_K}$) which had the least difference from the Referenced Test Information Function ($RTIF_{\theta_K}$), as shown in Figure 4.



	V1	V2
1	0.111232	0.003784
2	0.064609	0.017996
3	0.068847	0.028073
4	0.049025	0.009017
5	0.012124	0.000348
6	0.035625	0.021518
7	0.397457	0.141276
8	0.316964	0.292426
9	0.016512	0.000145
10	0.018582	0.000784
11	0.060297	0.001732
12	0.093869	0.015995
13	1.061097	0.109785
14	0.890605	0.03365
15	0.114582	0.237093
16	0.217206	0.105641
17	0.212011	0.092564
18	0.126925	0.004625
19	0.37308	0.271572
20	0.066591	0.029832
21	0.310001	0.003563
22	0.709015	0.021099
23	0.027786	0.00112
24	0.050813	0.010645

Figure 4 The results of the test information function according to the ability of examinees

The result of the accuracy verification of the automated test assembly programme regarding parallelism

McDonald (2009) stated that test parallelism should be considered from the correspondence between the information function of the referenced test ($RTIF_{\theta_K}$) and the automated test information function ($ATIF_{\theta_K}$).

This study determined the test information function according to the ability of examinees (θ) in order to be used in evaluating the accuracy of parallelism between the referenced test and the tests created from the ATA programme. There were three different cases as follows:

- Case 1 - the test information function of the referenced test of examinees with moderate ($RTIF_{\theta = 0.00} = 16.80$) and fairly high ability ($RTIF_{\theta = 1.50} = 10.00$).
- Case 2- the test information function of the referenced test of examinees with quite low ($RTIF_{\theta = (-1.50)} = 10.50$), moderate ($RTIF_{\theta = 0.00} = 16.80$), and fairly high ($RTIF_{\theta = 1.50} = 10.00$).
- Case 3 - the test information function of the referenced test of examinees with quite low ($RTIF_{\theta = (-1.50)} = 10.50$), moderate ($RTIF_{\theta = 0.00} = 16.80$), fairly high ($RTIF_{\theta = 1.50} = 10.00$), and high ability ($RTIF_{\theta = 2.50} = 5.00$).

The criterion adopted for evaluating the accuracy of parallelism was the Mean Square Deviation of Test Information Function (MSD of TIF), which had an index of less than 0.05 (Luecht, 1998; Chen, Chang & Wu, 2012). The followings were the details of each case:

Case 1 – When the automated test assembly programme stipulated the conditions of the test information function of the referenced test according to the two levels of ability of examinees, i.e. 0.00 and 1.50, it was found that the programme was able to produce four tests, two of which had the accuracy of parallelism. The MSD of TIF of the first parallel test and the second test were 0.02 and 0.00, respectively, as shown in table 1.

Table1: The test information function of the referenced test and the assembled test corresponding to the two levels of ability of examinees and the mean square deviation of test information functions of the tests

Levels of ability of examinees	TIF				
	$RTIF_{\theta_K}$	$ATIF_{\theta_k}$			
		Test 1	Test 2	Test 3	Test 4
0.00	16.80	16.85	16.80	17.00	17.03
1.50	10.00	9.80	10.00	10.30	7.50
MSD of TIF	-	0.02	0.00	0.06	3.37
The accuracy of parallelism	-	Being parallel to the referenced test	Being parallel to the referenced test	Not being parallel to the referenced test	Not being parallel to the referenced test

Case 2 - When the automated test assembly programme stipulated the conditions of the test information function of the referenced test according to the three levels of ability of examinees, i.e. (-1.50), 0.00 and 1.50, it was found that the programme was able to produce two tests, none of which showed the accuracy of parallelism, as shown in table 2.

Table 2: The test information function of the referenced test and the two assembled test according to the three levels of ability of examinees and the mean square deviation of test information functions of the tests

Levels of ability of examinees	TIF		
	$RTIF_{\theta_K}$	$ATIF_{\theta_K}$	
		Test 1	Test 2
(- 1.50)	10.50	6.00	6.00
0.00	16.80	16.85	16.80
1.50	10.00	12.80	13.20
MSD of TIF	-	9.36	10.16
Parallelism	-	Not being parallel to the referenced test	Not being parallel to the referenced test

Case 3 - When the automated test assembly programme stipulated the conditions of the test information function of the referenced test according to the four levels of ability of examinees, i.e. (-1.50), 0.00, 1.50, and 2.50, it was found that the programme was able to produce one test which did not show the accuracy of parallelism, as shown in table 3.

Table 3: the test information function of the referenced test and the two assembled test according to the four levels of ability of examinees and the mean square deviation of test information functions of the tests

Levels of ability of examinees	TIF	
	$RTIF_{\theta_K}$	$ATIF_{\theta_K}$
(- 1.50)	10.50	6.00
0.00	16.80	16.85
1.50	10.00	12.20
2.50	5.00	8.00
MSD of TIF	-	.837
Parallelism	-	Not being parallel to the referenced test

The results of the verification of the test assembly programme in terms of test overlap according to the levels of ability of examinees of the referenced test

Table 4: item exposure mean, item exposure variance, and average test overlap rate

Levels of ability of examinees	Test	Item exposure mean	Item exposure variance	$\hat{\bar{T}}$	Fulfillment of test overlap criterion
2	1	0.050	0.001	0.070	Fulfilled
	2	0.250	0.020	0.320	Not Fulfilled
	3	0.280	0.025	0.369	Not Fulfilled
	4	0.330	0.027	0.411	Not Fulfilled
3	1	0.050	0.001	0.070	Fulfilled
	2	0.350	0.030	0.430	Not Fulfilled
4	1	0.050	0.001	0.070	Fulfilled

Case 1 –When determining the test information function in respect of the two levels of ability of examinees, i.e. 0.00 and 1.50, it was found that the test assembly programme could produce one test paper whose average test overlap rate ($\hat{\bar{T}}$) was 0.070, which was lower than the agreed criterion (0.250). This suggested that one test produced from the test assembly programme had the ratio of test overlap lower than the agreed criterion, whereas the average test overlap rate of the other three tests was higher than the agreed criterion with the average test overlap rate of 0.320, 0.369, and 0.411, respectively, as shown in table 4.

Case 2 – When determining the test information function in respect of the three levels of ability of examinees, i.e. (-1.50), 0.00, and 1.50, it was found that the test assembly programme could produce one test whose average test overlap rate ($\hat{\bar{T}}$) was 0.070 which was lower than the agreed criterion (0.250). This suggested that one test produced from the test assembly programme had the ratio of test overlap lower than the agreed criterion, while the average test overlap rate of

the other test was higher than the agreed criterion with the average overlap of 0.430, as shown in table 4.

Case 3 –When determining the test information function in respect of four levels of ability of examinees, i.e. (-1.50), 0.00, 1.50, 2.50, it was found that the test assembly programme could produce one test paper whose average test overlap rate ($\hat{\bar{T}}$) was 0.070, which was lower than the agreed criterion (0.250). This suggested that one test produced from the test assembly programme had the ratio of test overlap lower than the agreed criterion, as shown in table 4.

The results of the verification of the test assembly programme in terms of parallelism and test overlap in respect of the levels of ability of examinees of the referenced test

Table 5: The result of the accuracy of test parallelism and the low average test overlap rate between test papers of the test assembly programme

Levels of ability of examinees	The accuracy of the test assembly programme			Numbers of test papers created by the programme
	Parallelism	Test overlap rate lower than 25%		
		valid	invalid	
2	valid	1	1	**2**
	invalid	-	2	**2**
total		**1**	**3**	**4**
3	valid	-	-	**-**
	invalid	1	1	**2**
total		**1**	**1**	**2**
4	valid	-	-	**-**
	invalid	1	-	**1**
total		**1**	**-**	**1**

Case 1 - When determining the test information function in respect of the two levels of ability of examinees, i.e. 0.00 and 1.50, it was found that the test assembly programme could produce one test that showed parallelism and had a low average test overlap rate ($\hat{\bar{T}}$) was 0.070 which was lower than the agreed criterion 0.250), as shown in table 5.

Case 2 - When determining the test information function in respect of the three levels of ability of examinees, i.e. (-1.50), 0.00, and 1.50, it was found that the test assembly programme could not produce any test that showed parallelism and had a low average test overlap rate ($\hat{\bar{T}}$), as shown in table 5.

Case 3 - When determining the test information function in respect of four levels of ability of examinees, i.e. (-1.50), 0.00, 1.50, 2.50, it was found that the test assembly programme could not produce any test that showed parallelism and had a low average test overlap rate ($\hat{\bar{T}}$), as shown in table 5.

Discussion

This study aimed to create the test assembly programme from the item bank in order to produce tests and to test the accuracy of the programme in terms of test parallelism of the test and test overlap rate. The result of the study indicated that the programme could produce two tests parallel to the referenced test, when considering the accuracy of test parallelism. The tests produced were suitable for predicting the scores of the two levels of ability of examinees: being moderate and fairly high. When considering both test parallelism and test overlap rate, the programme was able to produce only one test; this suggested that the programme could produce only one test with the accuracy of predicting the scores of the ability of examinees corresponding to the accuracy of the referenced test – namely, being moderate and fairly high. Furthermore, the item bank ensured the safety of item leak rate between tests that the rate was lower than 25%. When considering only test overlap rate, the programme could produce three tests with test overlap rate lower than 25%. The first paper could be used with examinees whose abilities were moderate and fairly high; but it could not estimate the scores of examinees corresponding to the referenced test. The second paper could be used with examinees whose abilities were quite low, moderate, and fairly high; but it could not estimate the scores of examinees corresponding to the referenced test. The third paper could be used with examinees whose abilities were quite low, moderate, fairly high, and high; but it could not estimate the scores of examinees corresponding to the reference, as shown in table 5.

From this study, the test assembly programme could produce two tests parallel to the referenced test. The tests produced had the accuracy of predicting the scores of the two levels of ability of examinees. When stipulating conditions of three and four levels of ability, the test assembly programme could produce one test that satisfied each condition of the levels of ability. The test produced, however, lacked of the accuracy of parallelism; the test could not accurately estimate the scores of examinees at three and four levels of ability. This study was supported by the principles established by de Ayala (2009) and McDonald (2009), according to which there is a correlation between a parallel test whose discrimination index is high (over 1.00) and a test information function (TIF) which indicates the accuracy of estimating the scores of ability of examinees in certain levels. Nevertheless, the item bank used in this study had a limitation as to the number of items that had high discrimination index. Consequently, items selected and used in one test could not adequately be used in the subsequent tests. It followed that the test assembly programme capable of producing parallel tests suitable for examinees with moderate and fairly high level of ability could not produce parallel tests suitable for examinees with quite low, moderate, and fairly high level of ability, and also not suitable for those with quite low, moderate, fairly high, and high level of ability. Furthermore, the result of this study also corresponded to that of Lin's (2008). Lin (2008) tested the accuracy of the test assembly programme created by WDM heuristic. It was found that the programme could produce parallel tests. The tests produced showed the accuracy of predicting the scores of the two levels of ability of students. The programme lacked, however, the accuracy of parallelism when more conditions of the levels of ability of examinees were stipulated; namely three and four.

Regarding the accuracy of the test assembly programme in terms of test parallelism of the test and test overlap rate, the programme could produce only one test with the accuracy of estimating the scores of the ability of examinees corresponding to the accuracy of the referenced test – namely, being moderate and fairly high. The safety of item leak rate between tests was lower than 25%. The test assembly programme could not produce any test that met the conditions of ability levels stipulated at the three and four levels of ability. This study corresponded to the result of a study conducted by Lin (2010) in which the accuracy of the automated assembly programme was tested in order to produce parallel tests through weighted deviations model (WDM) heuristic. The study also used a function that controlled test overlap rated in accord with the concept formulated by Chen and Lei (2009).

It was found that the test assembly programme was able to produce ten tests with test parallelism, and the tests produced could accurately estimate the scores of students only in one degree of ability – being moderate. This might result from the objectives of the production of parallel tests through the use of the test assembly programme: the accuracy of estimating the scores of ability of examinees and of controlling the test overlap rate between tests. The automated assembly programme stipulated four conditions on the item bank: first, the number of the items must be at least ten times more than the number of the items used in the actual test; second, the number of items with the difficulty index corresponding to the ability levels of examinees whose scores need to be estimated must be high; third, the number of items with high discrimination index must be high; and fourth, the stipulation of the conditions on the accuracy of estimating the scores of ability which corresponded to every level in the programme would affect the test overlap rate which did not satisfy the agreed criterion.

This study has limitations: namely, first, the test assembly programme could produce parallel tests with very low number and could not keep control of test overlap rate; second, the number of items that had the difficulty index corresponding to the ability levels of various examinees and with high discrimination index (over 1.00) was inadequate; and finally, the item bank used in this study was suitable for producing parallel tests for measuring academic performance only due to the fact that the parallel tests produced showed a high degree of the predictive accuracy of examinees with moderate ability, followed by those with low ability and fairly high ability. Future studies should take the followings into consideration. First, they should put emphasis on increasing the number of items in the item bank, so that the number of the items is adequate for producing parallel test effectively.

In particular, the number of items classified by content must be adequate for producing tests and the number of items with high discrimination index (over 1.00) ought to be increased.

Further research should investigate the influences of the size of an item bank and the range of discrimination index on the effectiveness of the automated test assembly programme so as to produce parallel tests whose test overlap rate are below the agreed criterion. The accuracy of the automated test assembly programme from the item bank should also be tested. Furthermore, so as to be able to perform one of the vital roles in examinations in educational institutes, a test assembly programmed should be constructed to produce parallel tests.

Implication

The test assembly programme constructed in this study can be used for organising examinations in order to make an effective measurement and evaluation, in particular for developing tests that show test parallelism and are capable of effectively controlling test leaks. These characteristics make the interchangeability possible. In addition, it can be beneficial to instructors when using this programme to produce parallel tests for test enhanced learning through repeated tests. Similarly, Butler and Roediger (2007) suggested that the long-term retention in learning among students could be supported by test-enhanced learning which allowed learners to participate in the repeated tests or simulated situations. Therefore, this opportunity is considered as being capitalized upon and testing is a vital process of students' learning process to improve their long-term memory in learning if students are engaging in assessment. It can be said that focusing on the assessment by utilizing parallel tests will ensure that learners are demonstrating the achieved or intended learning outcomes (Biggs & Tang, 2007).

Acknowledgments

This work was supported by the Ramkhamhaeng University.

References

Baker, F.B. (2001). *The Basics of Item Response Theory*. United States of America: ERIC Clearinghouse on Assessment and Evaluation.

Biggs, J.B. & Tang, C. (2007). *Teaching for Quality Learning at University*. (3rd Ed.).

Maidenhead: McGraw Hill Education & Open University Press

Butler, A.C. & Roediger, H.L. (2007). Testing improves long-term retention in a simulated classroom

setting. *European Journal of Cognitive Psychology*, 19, 514-527.

Chang, H-.H., & Zhang, J. (2002). *Hypergeometric family and item overlap rates in computerized adaptive Testing*. Retrieved August 15, 2015, from http//:library.lib.ru.ac.th/

Chen, P-.H., Chang, H-H., & Wu, H. (2012). *Item Selection for the Development of Parallel Forms from an IRT-Based Seed Test Using a Sampling and Classification Approach.* Retrieved April 30, 2016, from http//:epm.sagepub.com. search~S0*thx?/Xjournal +of+educational+measurement.

Chen, S. & Lei, P., 2009, *Investigating the relationship between item exposure and test overlap :Item sharing And item pooling***.** Retrieved September 30, 2016, from http://www.bpsjournals.Co.uk.

Chen, S., Ankenmann, R.D., & Spray, J.A. (2003). *The relationship between item exposure and test overlap in computerized adaptive testing*. Retrieved April 30, 2016, from http://link.springer.com/article/10.1007%2FBF0202294991.

de Ayala, R .J. (2009). *The Theory and Practice of Item Response Theory.* New York: The Guilford Press.

Diol, Q., & van der Linden. (2013). *Automated Test Assembly Using lp_Solve Version 5.5 in R.* Retrieved June 9, 2016, from https//:apm.sagepub.com.

Gorsuch, R.L (2003). Factor Analysis. In J.A. Schinka & W.F.Velicer (Vol.Eds). *Handbook of psychology : Vol. 2. Research methods in psychology. (pp.143-164)*. New York: John Wiley & Sons.

Hambleton, R. K. (1984). *Validating the test scores. In A Guide to Criterion-Referenced Test Construction*. Berk, R.A. (Ed). p. 199-230. Baltimore: The Johns Hopkins University Press.

Hambleton, R. K., & Swaminathan, H. (1996). *ITEM RESPONSE THEORY: Principles and Applications*. Norwel: Kluwer Academic Publishers.

Han, K .T., & Hambleton, R .K. (2007). *User's Manual :WinGen Center for Educational Assessment Report No .642*. Amherst, MA: University of Massachusetts, School of Education.

Lin, C-J. (2008). *Comparisons between Classical Test Theory and Item response Theory in Automated Test Assembly of Parallel Forms.* Journal of Technology, Learning, and Assessment .6 (8), 1–42.

Lin, C-J. (2010). *Controlling Test Overlap Rate in Automated Test Assembly of Multiple Equivalent Test Forms. Journal of Technology*. Retrieved July 9, 2016, from Available at: http://www.jtla.org.

Luecht, R .M. (1998). *Computer-assisted test assembly using optimization heuristics.* Applied Psychological Measurement, 22, 224-236

McAlpine, M. (2002). *Design Requirements of a Databank*. England: Computer Assisted.

McDonald, R. (2009). *Test theory :a unified treatment* .New Jersey: Lawrence Erlbaum Associates.

van der Linden, W.J. (2005). *Linear Models for Optimal Test Design*. New York: Springer Science +Business Media.

Modeling Retention in a Private University of Technology: Improving the Odds of Undergraduates

T.M. Cheng
Department of Construction Engineering, Chaoyang University of Technology, Taiwan
e-mail：tmcheng@cyut.edu.tw

H.Y. Hou
Office of Institutional Research, Chaoyang University of Technology, Taiwan
168, Jifeng E. Rd., Wufeng District, Taichung, 41349, R.O.C., Taiwan
e-mail：ttc050@gmail.com

D. C. Agrawal
Department of Applied Chemistry, Chaoyang University of Technology, Taiwan
e-mail: dc.agrawal99@gmail.com

J.Y. Lin
Department of Landscape and Urban Design, Chaoyang University of Technology, Taiwan
e-mail：jylin@cyut.edu.tw

ABSTRACT

The study attempts to investigate factors affecting the semester break and dropouts in a case University in order to achieve maximum retention and graduation rates. The data were collected from the official records of the day system of the 22 Departments in five colleges in two semesters. Also, we collected 2,402 records of grade point average of different curricula in different classes in May and November. Then basic statistical analyses of semester break and dropouts, retention rates, correlation, and logistic regression were carried out. Results showed that 'Interest' and 'Learning' problems influenced students' retention or dropout in the case University. From logistic regression, college, teacher, and attribute of the curriculum were found to be significant factors in prediction of the pass model. The study has significance to educators in determining factors influencing semester break, dropout, retention, and graduation rates in the university to achieve the maximum performance.

Keywords: Curriculum, Dropout, Fail, Graduation, Retention, Semester Break

Introduction

Although higher education in Taiwan is not compulsory, however, there was a 97% enrolment rate in the year 2017. The salaries in Taiwan mostly depend on the students' academic degrees. Therefore, most parents expect their children to graduate smoothly from universities. Worldwide higher education has moved from elite to mass access and has become a prerequisite for financial and social opportunities (Altbach, Berdahl and Gumport, 2016). In Taiwan, higher education has been the common background for youth before entering the job market Data on the average enrolment rate of r freshmen in the 22 Departments in the case University in September 2016 showed an enrolment rate as high as 95%. However, at the end of the semester in July 2017, an average graduation rate in the fourth year was 91%. It indicated that some students discontinued their studies. This, on the one hand, results in the revenue loss to the University, while on the other hand negatively affects the credibility of an institution. Since, decision-makers are committed to facilitating the pathways for students not only to access postsecondary education but also to have a reasonable chance of graduating (Lumina Foundation, 2009), therefore, it is important to investigate the factors negatively affect retention rates and students' graduation.

About the gap between the enrolment and graduation numbers, there are two main items that influence students to quit their studies. One is the 'Semester break' (meaning students quitting studies for at least one semester), and the other is dropout (meaning students discontinue their studies and do not return to school). One of the reasons for students' quitting their studies could be lack of learning motivation, and several factors may contribute to it. For example, school learning or materials are too difficult or boring; teachers are too strict in the evaluation, and or students' preference is towards non-academic activities. According to a study, individual characteristics such as background, attitude, behaviour, and performance play an important role in student's dropout rates (Rumberger, 2011). Poor interest can undermine motivation, thereby increasing the risk of dropout. Students' interests act as a driving force in their performance and continuity of their studies (Holland, 1997). In a separate study, Wilkins and Tracey (2014) have supported that when individuals' interests are compatible with their environment, they are more likely to persist in their major or stay in an occupation. Vianden and Barlow (2014) studied student loyalty with the notion that students who develop positive attitudes toward their institutions are more likely to continue.

The present study attempts to identify factors influencing students' retention and graduation rates for achieving the maximum performance. Also, it attempts to predict the pass model through logistic regression in order to improve the odds in the learning process.

Literatures Review

In this section, retention and graduation will be illustrated. Also, prediction of the pass model will be described in logistic regression analyses. In the end, a survey on students' quitting campus will be discussed.

Retention and Graduation

Emmons and Wilkinson (2011) stated that fall-to-fall persistence was better known as retention, and degree completion was most commonly called graduation. Retention is generally seen as the primary way to measure student success and experience during the first year, and it unsurprisingly has a positive relationship with graduation from the same institution (Hosch, 2008). In a recent report, Bingham and Solverson (2016) stated that student affairs practitioners and other university professionals are committed to helping each student achieve success (typically retention and eventual graduation). In addition to their importance for student success, retention and graduation rates are used for the purpose of accountability and institutional management (Gold and Albert, 2006; Hovdhaugen et al., 2013). In a separate study, it was found that academic advising, financial aid, and students' continuation were three important attributes of retention; while alumni and career services were two significant factors to graduation (Ng and Galbraith, 2016). The learning environment, social support, and perceived institutional support influenced the intention of undergraduates with regard to college completion (Darrin, 2014).

Prediction and Logistic Regression

Numerous models and theories related to student retention have been published (Aljohani, 2016). These models and theories address factors and variables (e.g., affordability, lack of access to jobs, and transfer to another university) which have been shown to influence students' decision to leave school prior to completion (Choudaha and Schulmann, 2014). In two separate studies, Miller and Herreid (2008), Singell and Waddell (2010) focused on creating models to determine students who were at risk for retention. In another study, Martin (2011) reported that in terms of academic factors, grade retention was a significant negative predictor of academic self-concept and homework completion and positive predictor of maladaptive motivation and absent from school. While, contrary to predictions related to academic struggles, Barry (2016) found that the primary reason for international students' attrition was compulsory military service.

In this paper, the authors employed logistic regression to develop the odds model. A logistic model is useful whenever the dependent variable has a two-level outcome or event and is thought to be influenced by one or more independent parameters which will influence the odds rate. In order to apply the regression model, the dependent variable is transformed into a continuous value that is a function of the probability of the event occurring (Rud, 2001). Similar to linear regression, logistic regression is based on a statistical distribution. Therefore, it matches the advantage with linear regression as a robust tool for developing analytical models (Rud, 2001). Besides, logistic regression was considered suitable here since the dependent variable (odds) is not continuous; rather it is a discrete variable with value 1 for those who pass in the semester evaluation of the subject and 0 for those who fail.

Survey on Quitting the Campus

There are several factors that can lead students to quit their studies. These could be lack of interest, learning difficulties, financial conditions, family issues, health-related problems, change in their career goals, and mandatory army service, etc. In a survey conducted by the office of the academic affairs at the University X, more than 46% students mentioned lack of interest as the main reason for their dropout (Cheng et al., 2018). In the case university, when students decide to quit their studies, each semester, the office of academic affairs asks the quitting students to fill out a questionnaire to determine the reasons for their dropout. Besides this information, the office of academic affairs also carries out a survey of grade point average (GPA) in each course with the parameters of college, year, teacher and attribute of subjects in each semester in case of quitting students. Therefore, in this paper, we have used the above data and carried out the inferential statistical analysis to detect significant factors to predict the pass model.

Methodology

Sample and Procedures

The students' semester break and dropout data were collected from records at the office of academic affairs of the case university. Data pertained to the day system of 22 departments in five colleges are: ***College of Management:*** Departments of Finance, Business Administration, Insurance, Accounting, Leisure Service Management, Marketing and Logistics Management, and Golden-Ager Industry Management; ***College of Science and Engineering:*** Departments of Construction Engineering, Industrial Engineering and Management, Applied Chemistry, Environment Engineering and Management; ***College of Design:*** Departments of Architecture, Industrial Design, Visual Communication Design and Urban Design; ***College of Humanities and Social Sciences:*** Departments of Communicate Arts, Applied English, Early Childhood Development and Education, and Social Work; ***College of Information:*** Departments of Information Management, Information Engineering, and Information and Communication Engineering). Data were collected in two semesters (January and July 2017). In addition, we also collected 2,402 records of grade point average (GPA) of different curriculums in different classes, including curriculums' names, instructors' names, attributes of courses (compulsory or optional) and GPA obtained in May and November 2017. Then we carried out basic statistical analyses of semester break and dropout, retention rates, correlation, and logistic regression to predict the pass model.

Measures and Variables

In the questionnaires of semester break and dropout, there were options of interest, learning, financial condition, work, family, army service, health, transfer, etc. The variables included were a department, gender, semester and year. The retention rate equals to (enrolled numbers minus semester break and dropout numbers at the end of each semester) / enrolled numbers. The fail rate means the average of fail subjects, which state at least one, fail to record in the course in the class.

For logistic regression in this paper, the independent variables were college, year, teacher and attributes of subjects. The dependent variable was the odds of passing the course. Independent variables were coded as follows: College (College(1)-Management: (1,0,0,0); College(2)-Science and Engineering: (0,1,0,0); College(3)-Design: (0,0,1,0); College(4)-Human and Society: (0,0,0,1); Information: (0,0,0,0)), Year (Year(1)-Freshman: (1,0,0); Year(2)-Sophomore: (0,1,0); Year(3)-Junior: (0,0,1); Senior: (0,0,0)), Teachers (Teacher(1)-Common: 1, Serious: 0) and Attribute of subjects (Attribute(1)-Optional: 1, Compulsory: 0).The dependent variable was coded as Fail (0) and Pass (1).

Results

Basic Statistics of Semester Break and Dropout

In 2016-2017, 346 students took semester break in the case university (shown in **Table 1** and **Table 2**). Among them, the number of male students (n=185) was higher than the females (n=161). The highest number of students who took a semester break in the case university was from the Department of Accounting. The number of students who took a semester break in the first semester was higher (n=209) than the second semester (n=137). The year-wise number of students who took a semester break in the case university in increasing order was as follows: the fourth year> the first year> the third year> the second year.

Table 1: Department and year-wise number of students who took a semester break

Department	Year				Total
	1	2	3	4	
Accounting	5	3	7	21	36
Information and Communication Engineering	5	5	4	17	31
Communication Arts	3	5	5	11	24
Architecture	7	1	6	9	23
Industrial Design	4	7	7	3	21
Information Engineering	3	3	3	11	20
Applied English	5	3	1	10	19
Visual Communication Design	5	3	4	4	16
Insurance	4	2	2	7	15
Industrial Engineering and Management	3	3	1	7	14
Business Administration	7	1	0	6	14
Applied Chemistry	7	2	1	4	14
Early Childhood Development and Education	4	2	4	3	13
Social Work	5	4	3	1	13
Information Management	2	3	5	3	13
Construction Engineering	3	2	2	5	12
Leisure Service Management	1	5	2	2	10
Environmental Engineering and Management	2	2	2	4	10
Finance	3	1	3	1	8
Urban Design	3	3	1	1	8
Golden-Ager Industry Management	4	0	2	1	7
Marketing and Logistics Management	0	2	0	3	5
Total	**85**	**62**	**65**	**134**	**346**

Table 2: Gender wise number of students who took a semester break

	Year/ Gender							
	1		2		3		4	
Semester	F	M	F	M	F	M	F	M
1	34	15	16	22	20	21	27	54
2	19	17	7	17	16	8	22	31
Sum	53	32	23	39	36	29	49	85
Total	**85**		**62**		**65**		**134**	

In 2016-2017, there were 462 dropouts in the case university (shown in **Table 3** and **Table 4**). Among them, the number of male students (n=245) was higher than for females (n=217). It was found that female students decided earlier to drop out compared to males. In Taiwan, every male needs to serve the army after graduation; therefore, male students decided to quit the campus in the last year during four years and resume their studies after mandatory service in the army. So that after graduation, they could directly go for a job. The highest dropout rate was noted in the Department of Accounting. Since higher number of female students had difficulty in accounting, they quit earlier than males. The number of dropouts was more in the first semester (n=313) than in the second semester (n=149). The year-wise number of dropouts in the increasing order was as follows: the second year> the third year> the fourth year> the first year.

Table 3: Department and year-wise number of dropouts

Department	Year				Total
	1	2	3	4	
Accounting	6	15	14	7	42
Applied Chemistry	3	15	8	8	34
Architecture	9	14	7	3	33
Industrial Design	3	10	5	10	28
Information Engineering	5	10	5	8	28
Industrial Engineering and Management	2	5	10	8	25
Communication Arts	2	6	9	5	22
Information and Communication Engineering	1	13	2	5	21
Industrial Engineering and Management	0	7	6	7	20
Visual Communication Design	3	7	4	6	20
Leisure Service Management	2	8	6	3	19
Business Administration	3	8	4	4	19
Social Work	4	7	4	4	19
Environmental Engineering and Management	4	8	6	1	19
Insurance	0	11	2	5	18
Finance	0	7	8	3	18
Applied English	5	7	3	3	18
Golden-Ager Industry Management	4	8	3		15
Construction Engineering	2	5	3	4	14
Marketing and Logistics Management	1	3	3	4	11
Urban Design	2	4	2	3	11
Early Childhood Development and Education	2	3	1	2	8
Total	**63**	**181**	**115**	**103**	**462**

Table 4: Gender and year-wise number of dropouts

	Year/Gender							
	1		**2**		**3**		**4**	
Semester	F	M	F	M	F	M	F	M
1	28	17	78	56	29	41	22	42
2	11	7	21	26	17	28	11	28
Sum	39	24	99	82	46	69	33	70
Total	**63**		**181**		**115**		**103**	

From the questionnaires of the semester break and dropout, it was known that 'interest' and 'learning problem' were the major factors. Department-wise number of students who took a semester break and dropouts were as follows:

- Lack of interest – In the Department of Information Communication, Communication Arts, Architecture, Industrial design, lack of interest was the main factor.
- Learning Problem – In the Department of Accounting, Applied Chemistry, Architecture, Industrial design, and Information Engineering, there were strict teachers who allowed students to fail over two courses. The reason for dropout was related to the learning problem. Students found the subjects difficult and teachers were strict in evaluation that influenced the learning problem.

Retention Rate Analysis

The retention rate equals (Number of enrolled students minus the number of students who took a semester break and a number of dropouts at the end of each semester) / (number of enrolled students). The lowest retention rate among the 22 departments in four years was 0.80, and the highest was 0.99. Therefore, we set the constant line in retention rate lower than 0.89 to check the alarming value in the retention chart (**Figure 1**).

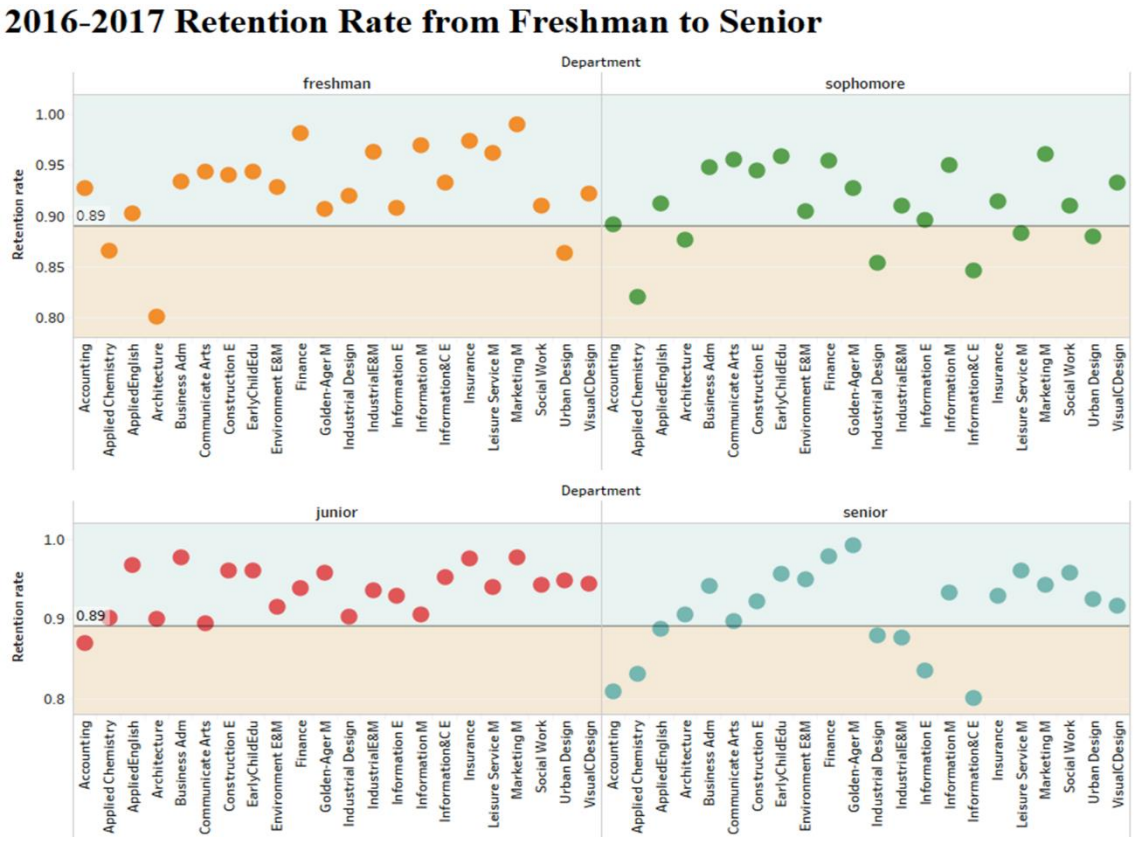


Figure 1: Retention rate chart

From **Table 5** we found that:

- In the first year, the retention rate in Architecture, Applied Chemistry and Urban Design was lower than 0.89.
- In the second year, six departments had lower retention rates than others. In addition to Architecture, Applied Chemistry, and Urban Design, Industrial Design, Information Communication, and Leisure Service Management were added.
- In the third year, only the Department of Accounting had a score lower than 0.89.
- In the fourth year, retention rates in the Department of Accounting, Applied Chemistry, Industrial Design, and Information Communication were lower than 0.89.

Table 5: The department-wise and year-wise retention and fail rates

College	Department	Retention Rate				Fail Rate (%)	
		freshman	sophomore	junior	senior	Sem1*	Sem2*
Management	**Finance**	0.981	0.954	0.938	0.978	66.2	67.7
	Business Adm	0.934	0.948	0.976	0.941	43.5	50.0
	Insurance	0.974	0.914	0.975	0.928	63.2	64.1
	Accounting	0.928	0.891	0.870	0.808	72.2	81.1
	Leisure Service M	0.962	0.883	0.940	0.960	50.0	54.5
	Marketing M	0.990	0.960	0.977	0.942	57.5	31.1
	Golden-Ager M	0.907	0.927	0.958	0.991	26.9	39.6
Science and Engineering	**Construction E**	0.940	0.945	0.959	0.921	58.6	63.2
	IndustrialE&M	0.963	0.910	0.935	0.876	66.0	66.7
	Applied Chemistry	0.865	0.819	0.901	0.831	66.7	77.8
	Environment E&M	0.928	0.904	0.914	0.948	77.8	69.0
Design	**Architecture**	0.800	0.876	0.900	0.905	78.7	63.6
	Industrial Design	0.920	0.853	0.902	0.879	61.0	54.7
	VisualCDesign	0.922	0.933	0.944	0.916	59.0	60.5
	Urban Design	0.863	0.879	0.948	0.925	46.2	42.9
Human and Society	**Communicate Arts**	0.944	0.956	0.894	0.897	54.2	50.7
	AppliedEnglish	0.902	0.912	0.967	0.887	60.0	49.2
	EarlyChildEdu	0.943	0.959	0.959	0.956	25.4	38.2
	Social Work	0.910	0.910	0.943	0.958	71.2	56.8
Information	**Information M**	0.969	0.950	0.904	0.933	73.2	85.2
	Information E	0.908	0.895	0.929	0.835	93.5	86.0
	Information&C E	0.933	0.846	0.952	0.800	78.0	78.6
Mean		0.927	0.910	0.936	0.910	61.3	60.5

Note: *Sem = Semester

The trend of retention rate in the Department of Accounting was negative. The main factor was the learning problems (known from the questionnaires). It matched the high failure percentage of 76.65. The students had higher pressure in learning (known from the questionnaires). Department of Applied Chemistry also had a lower retention rate. Especially in the first year, freshmen could not adapt to a strict evaluation by teachers hence could not pass. With strict teachers, this trend continued from the first to fourth year. Therefore, the learning problem existed each year.

In the Department of Information Engineering, Information Communication, Industrial Engineering and Management, and Industrial Design students' had to obtain a license by passing the compulsory subject before they could graduate. Due to this requirement, many students had to extend their studies. Therefore, it is necessary that teachers motivate students and make extra efforts (remedial education) from the beginning so that students' can graduate in time.

We traced factors for retention in the Department of Leisure Service Management in the second year. Three students filled the survey questionnaire and described that they need to transfer to night system because of family and work-related issues. This resulted in a retention rate lower than 0.89.

Correlation Analysis

In the correlation analysis (shown in **Table 6**), the freshman and the sophomore were positively related. The sophomore was significantly positively related to the senior. Also, the junior was significantly positively related to the senior. Thus it can be inferred that if a freshman can adapt in the first year, he or she is likely to continue to study in the second year. Also, if a sophomore could pass the most difficult courses, he or she can easily pass the third and the fourth year. Higher the number of failed subjects lower would be the retention (graduation) rate in the last year.

Table 6: Correlations

		freshman	sophomore	junior	senior	Fail Rate	
						Sem1	Sem2
freshman	Pearson Correlation	1	.562**	0.307	0.255	-0.132	-0.049
	Sig.		0.007	0.165	0.252	0.559	0.83
sophomore	Pearson Correlation	.562**	1	0.376	.616**	-0.379	-0.387
	Sig.	0.007		0.084	0.002	0.082	0.075
junior	Pearson Correlation	0.307	0.376	1	.443*	-.443*	-.543**
	Sig.	0.165	0.084		0.039	0.039	0.009
senior	Pearson Correlation	0.255	.616**	.443*	1	-.554**	-.592**
	Sig.	0.252	0.002	0.039		0.007	0.004
Sem1	Pearson Correlation	-0.132	-0.379	-.443*	-.554**	1	.794**
	Sig.	0.559	0.082	0.039	0.007		0
Sem2	Pearson Correlation	-0.049	-0.387	-.543**	-.592**	.794**	1
	Sig.	0.83	0.075	0.009	0.004	0	

Note: **. Correlation is significant at the 0.01 level (Two-Tailed).

*. Correlation is significant at the 0.05 level (Two-Tailed)

Sem = Semester

Logistic Regression Analysis

For the Logistic Regression in this paper, the independent variables were: college, year, teacher and attributes of subjects. The dependent variable was the odds of passing the course. The results in **Table 7** show that the College of Science and Engineering, and college of Information had significantly fewer scores compared to other colleges. Less strict teachers were significantly better than the strict teachers in granting the passing scores. Also, it was easier to pass optional courses compared to compulsory ones.

Pass Equation:

Logit (Pass) =.723-.043×college(1) -1.747×college(2) -.795×college(3) -.884×college(4)-.693×year(1)-.802× year(2)-.087× year(3)+5.059× Teacher(1)+1.049× Attribute(1) (1)

Table 7: Logistic Regression Model.

		B	S.E,	Wals	df	Sig.	Exp(B)
Step 1_a	college			14.84	4	.005**	
	college(1)	-.043	.706	.00	1	.951	.958
	college(2)	-1.747	.523	11.14	1	.001**	.174
	college(3)	-.795	.560	2.02	1	.156	.452
	college(4)	-.884	.654	1.83	1	.177	.413
	year			3.46	3	.327	
	year(1)	-.693	.723	.92	1	.338	.500
	year(2)	-.802	.707	1.29	1	.256	.448
	year(3)	-.087	.729	.01	1	.905	.917
	Teacher(1)	5.059	.437	134.05	1	.000**	157.485
	Attribute(1)	1.049	.419	6.27	1	.012*	2.856
	Constant	.723	.717	1.02	1	.313	2.061

Note: a. Variables: college, year, Teacher, Attribute.

**. The p-value is significantly smaller than 0.01

*. The p-value is significantly smaller than 0.05

Discussion

Compulsory vs. Optional Courses

Zhou (2014) stated that by taking the advanced module as optional courses, from teaching achievements and students' reflection, new curriculum system could effectively improve the interest of students in learning mathematics and increase the pass rate at the final examination. From Logistic regression analyses, it can be inferred that optional courses were significantly easier to pass compared to the compulsory ones. Therefore, it would be helpful if the course

committee transfers the compulsory course to the first and the third year to avoid failure in the last semester, especially in the alarming departments.

Day vs. Night Programme

Nowadays, a majority of colleges and universities offer night and weekend classes for those working on a typical Monday to Friday job (Boulder County Business Report, 2011). In the present study, it was found that three second-year students in the Department of Leisure Service Management changed their class schedule from day to night and continued their studies in the university avoiding dropouts. Therefore, the office of academic affairs needs to factor in such a situation and consider not counting such students as dropouts.

Highly Strict vs. Less Strict Teacher

Stage and Kloosterman (1995) have earlier reported the influence of teacher characteristics on the performance of students in mathematics. Responsive lecturers have been found to be popular with students and contribute to retention (Kirk, 2017). In our study, from logistic regression analysis, it was found that less-strict teachers were significantly better than the highly-strict teachers in granting the pass scores. Thus, it is necessary that if a teacher is too strict in granting pass scores, then students should be given some kind of remedial education to avoid high dropout rates. The responsible teacher can devote his or her efforts to guiding students through multiple teaching and evaluation methods. Roberts (2018) stated professional staff influenced the student lifecycle and contributed to student retention and success. Therefore, each academic or administrative staff can offer adequate service to students and enhance the chances of their continuation in the university.

Implication of the Research

As an outcome of this study, there are several indicators for the administrative and academic sections of the case university. For example, in the Departments of Accounting, and Applied Chemistry students were placed in the lower retention groups out of 22 departments. Reasons were a strict evaluation by teachers and difficult learning materials. These issues can be solved by remedial education to low achievers by providing, e-learning courses, assistance in teaching, psychological counselling and multiple assessments. Regarding the issue of lack of interest, a survey of their interests at an early stage will be of great help for the tutors to find the Person-Environment Congruence of learners, especially for the freshmen. Cheng et al. (2018) found that application of easier and more interesting mode of teaching methods could be adopted in the class in the following semester so that low consistency learners having flexible personalities are able to enhance their odd rates.

Conclusions

Thus, in this study, we find that ‘interest’ and ‘learning problem’ were major factors that influenced students’ retention or dropouts. Other factors that influenced students’ GPA and retention rate were course type (compulsory vs. optional), nature of teacher (highly-strict vs. less-strict) and college (Science and Engineering, and Information vs. other colleges). In order to achieve the maximum retention rate in the university, it is very important that administrators,

faculty, and staff make concerted efforts in caring for the needs of freshmen as they enter the university. It would be advantageous for students to arrange some sort of remedial education if a teacher is too strict in the evaluation and granting pass scores to them. In addition, night and or weekend classes would be helpful to students' who have jobs but wish to study further. Also, a curriculum committee in the university should include compulsory courses in the first through the third year so that students' if they fail have the opportunity to repeat the course before their final year. These measures can be of help in achieving the highest retention and graduation rates in the case university.

References

Aljohani, O. (2016). A review of the contemporary international literature on student retention in higher education. *International Journal of Education & Literacy Studies*, 4(1), 40–52.

Altbach, P. G., Berdahl, R. O., and Gumport, P. J. (2016). *American higher education in the twenty-first century: Social, political, and economic challenges*. Baltimore, MD: The John Hopkins University Press.

Barry F. H. (2016). International Undergraduates' Retention, Graduation, and Time to Degree. *Journal of International Students*, 6 (4), 933-955.

Bingham, M. A., and Solverson, N. W. (2016). Using Enrollment Data to Predict Retention Rate, *Journal of Student Affairs Research and Practice*, 53(1), 51–64.

Boulder County Business Report. (2011). Figure out what path you're on before making course selection. *Boulder*, 30(23), 10B.

Cheng, T.M., Hou, H.Y., Agrawal D.C., and Hsu, S.C. (2018). The Influence of Freshmen's Psychological Characteristics on Learning Performance and Retention. *JIRESA*, 16(1), 126-151.

Choudaha, R., and Schulmann, P. (2014). Bridging the gap: Recruitment and retention to improve international student experiences. Retrieved from http://www.nafsa.org/epubs

Darrin, T. (2014). Factors that Influence College Completion Intention of Undergraduate Students. *The Asia-Pacific Education Researcher*, 23(2), 225–235.

Emmons, M. and Wilkinson, F.C. (2011). The Academic Library Impact on Student Persistence. *College & Research Libraries*, 72, (2), 128-149.

Gold, L., and Albert, L. (2006). Graduation rates as a measure of college accountability. *American Academic*, 2(1), 89–106.

Holland, J. L. (1997). Making vocational choices: A theory of vocational personalities and work environments (3rd ed.). Odessa, FL: Psychological Assessment Resources.

Hosch, B. J. (2008). Institutional and student characteristics that predict graduation and retention rates. Paper presented at the annual meeting of the North East Association for Institutional Research. Retrieved from http://www.ccsu.edu/uploaded/departments/AdministrativeDepartments/Institutional_Research_and_Assessment/Research/20081104a.pdf

Hovdhaugen, E., Frolich, N., and Aamodt, P. O. (2013). Informing Institutional Management: institutional strategies and student retention. *European Journal of Education*, 48(1), 165-177.

Kirk, G. (2017). Retention in a Bachelor of Education (Early childhood studies) course: students say why they stay and others leave. *Higher Education Research & Development*, 37(4), 773-787.

Lumina Foundation (2009). Lumina Foundation's strategic plan: Goal 2025. Indianapolis.

Martin, A. J. (2011). Holding back and holding behind: grade retention and students' non-academic and academic outcomes. *British Educational Research Journal*, 37(5), 739-763.

Miller, T. E., and Herreid, C. H. (2008). Analysis of variables to predict first-year persistence using logistic regression analysis at the University of South Florida. *College & University*, 83(3), 2–11.

Ng, P., and Galbraith, C. (2016). Strategic enrolment management (SEM) in self-financed higher education of Hong Kong: evaluation and measurement. *Asia Pacific Education Review*, 17(1), 161–174.

Roberts, J. (2018). Professional staff contributions to student retention and success in higher education. *Journal of Higher Education Policy and Management*, 40(2), 140-153.

Rud, O. P. 2001, "Data mining cookbook: modeling data for marketing, risk, and customer relationship management", John Wiley & Sons.

Rumberger, R. W. (2011). Dropping Out: Why Students Drop Out of High School and What Can Be Done about It. Cambridge, US: Harvard University Press.

Singell, L. D., and Waddell, G. R. (2010). Modeling retention at a large public university: Can at-risk students be identified early enough to treat? *Research in Higher Education*, 51(6), 546–572.

Stage, F. K. and Kloosterman, P. (1995). Gender, beliefs, and achievement in remedial college-level mathematics. *The Journal of Higher Education*, 66, 3.

Vianden, J., and Barlow, P. J. (2014). Showing the love: Predictors of student loyalty to undergraduate institutions. *Journal of Student Affairs Research and Practice*, 51(1), 16–29.

Wilkins, K. G., and Tracey, T. J. G. (2014). Person-environment fit and vocational outcomes. In Psycho-Social Career Meta-Capacities: Dynamics of Contemporary Career Development (pp. 123-138). Springer International Publishing.

Zhou H.J. (2014). The Exploration of Mathematics Curriculum Systems at Independent Colleges. *College Mathematics*, 30(1), 60-63.

The Reality of The Challenges Faced By Graduate Students In The Faculties Of Educational Sciences In Jordanian Universities.

Najwa Abdel Hamid Darawsha
Jadar University of Excellence, Jordan

ABSTRACT

The study aimed to reveal the reality of the Challenges that face graduate students in the faculties of educational sciences in Jordanian universities and suggests solutions that contribute to reducing them from the perspective of the students. The descriptive, analytical method was used. The study sample consisted of (432) male and female students.The study instruments were the questionnaire and the interview). The results showed that the Challenges that face graduate students in the educational sciences faculties in the Jordanian universities were high. The results also indicate that there were no statistically significant differences due to the variables of the study (gender, full-time study, and study schedule). The results showed that the most frequent suggestion is that "publishing a research should not be a condition for discussing the student's thesis. The researcher suggests preparing, qualifying and training students on writing a thesis as well as involving them in educational –training courses.

Keywords: Challenges, Postgraduate Students.

Introduction and Theoretical Framework

Universities are considered one of the means that reflect the hopes and aspirations of the prestigious societies. It has the role was to preserve the heritage of the past and transfer it from generation to generation through the functions it performs. This role was developed to improve the community service and respond to its demands by what the higher education through its academic staff, postgraduate and researchers offer from research and studies to serve the community and solve its issues and challenges through constant evaluation and development of its academic programs and services.

In light of the great increase of scientific and technological knowledge and its applications, higher education levels have recently risen rapidly around the world. This is due to the effective elements in the preparations of the students for the job market (Barro,R and Lee,J, 2013).Moreover, the postgraduate period as seen by (Young, 2014; Al-Ajiz N ,2006; Sunqer, 1998) which is complementary to the role of the community to heighten societal responsibilities. It works to confirm information, acquire students' scientific and practical experience, develop their skills, and increase their abilities to apply their acquired information to deal with life in more logically and objectively. Therefore, higher education institutions must provide qualified academic staffs who are capable to achieve its noble goals, improves its performance and service efficiently through a performance orientation to achieve competitive advantage and work constantly to identify the challenges, find appropriate solutions. This is important especially as the number of students who enrolled in postgraduate studies is increasing and at the same time they are facing different challenges which hinder their achievements and consequently it will affect the implementation of their scientific research results in life appropriate fields. With the increasing interest in postgraduate studies and the increasing number of students enrolled in postgraduate studies, there have been several challenges facing graduate students globally and internationally which attracted the attention of many scholars to study this phenomenon and find solutions.

Some of these challenges are:

1-Academic problems related to the supervision of doctoral and master's degrees.

Postgraduate research degrees and the challenges of effective supervision are high on the agenda of many higher education institutions. Some institutions require the new supervisor to be trained before supervising students. Others require regular continuing professional development for existing supervisors (Adrian, R and Roy, J, 2005), because they realize how this affects the performance of postgraduate students while preparing their thesis. The increasing number of postgraduate students also overloads the responsibilities of the academic staff who are not only teaching but also supervising the research of the master and doctoral students.This plays a role in increasing the challenges postgraduate students face.

2- Challenges facing postgraduate students

There have been numerous studies to define and investigate the challenges faced by graduate students in various fields for instance. Vehvilainen (2009) noted that the problems faced by students are the frequent routine procedures in the administration of the university of which

the student must pass before approving the title of the study, The views of the supervisors are varied and sometimes contradictory, particularly during the discussion sessions. Al-Moghrebi (2012) divided the challenges into financial difficulties such as inadequate availability of funding, poor financial resources of the student himself, and the high cost of the expenses paid by the student to complete his thesis (research papers, In addition to the lack of experience that enables him to identify the problem of the study and its questions.

Nenty (2009), who aimed to identify the challenges of research skills facing graduate students in education at the University of Botswana. The results of her study revealed that the challenges faced by students related to the selection of the research problem and the acquisition of the research and statistical skills necessary for research were high.Most of the students are directed towards qualitative research rather than qualitative research.

A recent study by Shu-Yuan Lin & Scherz (2014) aimed at identifying the complications faced by international graduate students at the American University. The results showed that international graduate students face research, academic and psychological difficulties, the most important of which is adapting to the new cultural environment, understanding the academic language, learning the academic courses and the concepts of the different disciplines.

In a study aimed at identifying the academic problems facing the master's of Faculty of Education at Taif University, Abu Ela (2015) stated that the academic problems facing the Master students as coming from the academic decisions and scientific supervision.

3. Challenges faced by graduate students in Jordan

The program of graduate studies in Jordanian universities witnessed a remarkable development in various disciplines in the past few years, which led to an increase in the number of students enrolled in various disciplines from Jordan and other regions, especially in the faculties of educational sciences and with diversity of students, the challenges varied. Many challenges have emerged, including psychological, economic, academic and research, all of which contribute to obstructing the progress of their education either during the program of studies, or in the preparation of their dissertations. These differences vary according to the views of the students themselves, both in terms of preparing for their university thesis. This includes those are directly related to their abilities, skills, personal circumstances and scientific and research capabilities such as the low level of scientific and linguistic abilities of graduate students, and their unwillingness to research and study, and low levels in the statistic skills that is taken within the course of the university theoretical and not applied. Several studies have been conducted in Jordan to shed light on some of these problems in an attempt to find appropriate solutions.

Al-Salem (2017) conducted a study aimed at identifying the degree of challenges faced by students of postgraduate studies in Jordanian public and private universities in preparing their thesis and proposal in the capital of Amman from postgraduate students and the department chairman perspective. The descriptive approach was used. The results of the study showed that the degree of technical, administrative and financial Challenges experienced by postgraduate students was (moderate). The results also showed that there were no statistically

significant differences due to the variables (gender, supervisor, level of the obtained certificate)**.**

While the study of Darawsha and Abd al'al (2017) aimed to identify the challenges, facing graduate students in the faculties of education in Jordanian universities in completing the requirements of publishing the research paper from their perspective and suggesting solutions. The results of the study showed that the challenges faced by postgraduate students in completing the requirements of advanced research were (high). The results also showed that there were no statistically significant differences due to (gender, full-time study and university). Students' choice of the paragraph "the research paper should be a condition for graduation rather than discussion of the thesis with (high) degree. The researcher benefited from the results Darawsha and Abd al'al study where it corresponded with some of the results in terms of research problems and differed from it in that this study included the different challenges faced by postgraduate students.

The previous studies have emphasized on the challenges faced by graduate student, that varied between Arab and foreign studies, but most of them applied the questionnaire as a study instrument, while others used the interview, although the methods vary, there are similarities in some aspects and differences in others. The researcher has benefited from building the study tool from the previous studies, and the theoretical literature related to the subject of this study. The researcher has also benefited from these studies to develop the tool of the collecting information, identify the results and compare them with the results of the current research, and used the appropriate statistical process, to strengthen some views on the theoretical framework. This study is similar to the previous studies in dealing with the challenges faced by graduate students and differed in dealing with new axes and paragraphs.

Study Problems and Questions

The researcher noticed from her experience in the field of higher education the challenges facing the graduate student through their educational stages, whether the academic or in research. This forces her to identify these challenges to arise and clarify them to the decision makers in order to contribute in solving and facilitating their completion of scientific research within time, less effort and less cost, which increases the efficiency of internal and external teaching at the University. Darawsha and Abdal'al (2017) recommended more attention to the role of the major advisor in providing assistance in the preparation stages of the proposal and how to write the research paper and publishing it.

In accordance to the previous studies, the idea of studying these challenges has been crystallized, aiming to identify the challenges facing the graduate student in different domains whether the academic, research, economic or psychological.

To reveal the reality of the challenges faced by graduate students in the faculties of educational sciences in Jordanian universities, and to find solutions.

The study addresses several further questions that stemmed from the research problem, the questions that are:

1. **Question One**: What are the most prominent scientific Challenges faced by graduate students in the faculties of educational sciences in Jordanian universities from their perspective?
2. **Question Two**: Are there statistically significant differences at the level of significance (0.05 = α) in the mean of the graduate students themselves to the challenges they face, due to the variables (gender, program, and full time of study)?
3. **Question Three**: What are the most prominent solutions proposed to reduce the Challenges facing graduate students in the faculties of educational sciences at Jordanian universities?

Significance of the Study

This study draws its significance from the importance subject it deals with and objectives it seeks to achieve. The challenges faced by graduate students are considered a vital topic of growing interest. Even though, the subject is important, it still needs more studies that are Arabic. This study differs from other studies as to the choice of dealing with a topic that represents the importance of scientific research and its role in studying the challenges and phenomena that encounter the process of comprehensive development in various aspects of life. It also aims to reveal the challenges facing the graduate students in light of the expansion and increased demands for higher education in the master's and doctoral degrees and the increased number of enrolled students, in addition to trying to highlight the role of universities in the interest of the development of scientific research in general and thesis in particular.

Study Objectives

This study aimed at identifying:

1) The most prominent challenges faced by graduate students in the faculties of educational sciences in Jordanian universities from the perspective of graduate students.
2) Identify the differences in the level of challenges faced by graduate students due to variables (gender, studying program, and full - time study).
3) Identify the suggestions presented by graduate students to address the challenges fac ed.
4) This study may contribute to provide the leaders, officials and decision makers with the Challenges facing students, to be taken into account in the development and scientific reform.

Study Limitations

The current study is limited to graduate students at Jordanian public universities for the academic year (2017/2018). The results are determined by the application process and the seriousness of the sample of the study in response to the study instrument, and the availability of the Psychological testing related to reliability and validity.

Methodology and Procedures

Study Methods: The analytical, descriptive method was used in this study.

Study population and Sample: The study population comprises of all (2379) male and female graduate students during the academic year (2017/2018) according to human resources statistics at Yarmouk and Jordan Universities, 2018. A random sample of 20% of the study population was taken to ensure that the sample of the study was well represented in the study population. The study sample consisted of (480) male and female students and 432 questionnaires were retrieved for statistical analysis. (8.5%). The exclusion of (30) questionnaires as an exploratory sample and (18) an invalid questionnaire for analysis. Table (1) shows the distribution of the sample members according to the variables.

Table 1: Study Sample according to Study Variables

Variable	Level	No.	Percentage%
Gender	Male	149	34.5%
	Female	283	65.5%
Total		432	100%
Program	Master	86	19.9%
	PhD	346	80.1%
Total		432	100%
Full – time study	Full -time	198	45.8%
	A part-time	234	54.2%
Total		432	100%

The sample of the study was distributed according to the variables according to the following variables: As for the gender variable, it consisted of 149 males with 34.5% and 283 female 65.5% (19.9%), (346), and (80.1%). Finally, the full-time variable was divided into (198) full-time (45.8%) and (234) part-time (54.2%).

Study Instruments

To collect the necessary data, the researcher used two instruments (questionnaire, interview). The following is a detailed description of these two tools:

The first instrument:
Questionnaire: The questionnaire was constructed of (30) paragraphs, divided into five domains, to measure the degree of challenges faced by graduate students. The 5-point Likert Scale was adopted by giving each paragraph one degree as follows: Very high, High, Medium, Low, Very Low) and then by asking questions for the interview conducted on the students of the Masters and PhD **.**

The second instrument:
Interview: A basic question was asked in the interview for doctoral students in Jordanian universities, which focused on the main question: What are the most prominent solutions proposed to reduce the Challenges facing postgraduate students in the educational sciences faculties in Jordanian universities?

Standard of correction of the instrument:
The statistical model with the 5 - Point Likert Scale was implemented, to judge the mean of the study instrument and its paragraphs. The statistical standard was applied using the following equation:

Very Low	Low	Moderate	High	Very high
1.00 -1.80	1.81- 2.6	2.61 – 3.40	3.41 -4.20	4.20 – 5.00

The scale has been implemented by using the following equation:

Maximum scale (5) - Minimum scale (1) / Number of required categories (5)

1-5 \ = 0.80 then add the answer (0.80) to the end of each category

Validity and Reliability of the Instrument: The validity of the tool was confirmed. It was presented to a number of experienced arbitrators from the Jordanian universities. Ten arbitrators of academic leaders and faculty members of the faculties of education in Jordanian universities, requested to read the paragraphs of the questionnaire, to express opinion in the degree of clarity, integrity of language formulation and degree of relevance to the field to which it belongs, and to add, delete, to formulate or suggest suitable paragraphs. Finally, all the points of view of the tool relevance were taken in consideration until the final (30) paragraphs of the questionnaires were approved.

Table 2: indicates the persistence stability coefficients (Pearson) and the coefficients of internal consistency stability (Cronbach's alpha) for each of the of postgraduate and the of studies as whole

No.	Domains	NO paragraphs	Constant consistency coefficients (Cronbach)	Repeatability coefficients (Pearson)
1	Student	10	0.84	0.82
2	Academic	11	0.87	0.84
3	Research	10	0.88	0.85
Total	31	31	0.87	0.83

Table 2 indicates that the internal consistency stability for the instrument in total is (0.87) the stability values for the domains ranged (0.84-0.88) .While The repeatability coefficient of the study instrument in total (0.83) .In light of the conducted results of validity and reliability the researcher beliefs that the reliability is approved for achieving the objectives of the study.

Study Variable

The study variables were divided into parts independent variables: gender, study program and full - time study while the dependent variable was the challenges of graduate students and

suggested solutions. The Mean and standard deviations were used to answer the first and second question, and the third question was frequency and percentages.

Results and Discussion

The following is a discussion of the statistical results concluded after analyzing the data of the study instrument. The differences between the variables of the study and the nature of the relationship between variables will be presented by answering the study questions.

Results and the discussion of the first question: *What are the most prominent scientific challenges faced by graduate students in the faculties of educational sciences in Jordanian universities from the perspective of the students themselves?*

To answer this question, the researcher estimated the mean and standard deviations of the study instrument domains, as illustrated in the following table:

Table 3: Mean and standard deviations of the study domains arranged in descending order according to the Mean

NO.	Rank	Domains		Mean	Standard deviations	Degree
3	1	Research challenges	10	3.80	0.82	High
1	2	Students challenges	9	3.71	0.37	High
2	3	Academic challenges	11	3.48	0.72	High
No.		Total instrument	30	3.71	0.65	High

The results of this question indicated that the most prominent scientific challenges faced by graduate students in the faculties of educational sciences in Jordanian universities from the perspective of the students came with an average of (3.80) paralleling to the degree (high). The domains were ranked respectively: (research challenges) with an average of (3.80),(Students challenge) with an average of (3.71), Academic challenges with an average of (3.48). All the preceding domains have ranked (high). This may due to the challenges faced by graduate students in the levels of Master degree (thesis program) and PhD in preparation of their scientific thesis, research procedures and student related challenges. The results of this study correlated with the result of Nenty(2009) and Darawsha and Abd ala'l (2017) which came at (high) degree. Whereas the result of this study differs from Al Salem's study(2017) which was (moderate).The following is a detailed illustration of the discussion of each domain in the order in which the results are as follows:

The first domain :Research challenges.

Table 4: Mean and standard deviations of the domain of Challenges (Research)

No.	Items	Mean	Standard deviations	Level
1	The student suffers from the slow process of the journals to respond to acceptance or rejection which takes long time	3.85	0.38	High
2	Students face difficulty in persuading the members of the discussion committee of the thesis plan to study	3.84	0.37	High

3	The weakness of students in how to extract research according to the publication specifications of the scientific journals	3.83	0.37	High
4	Weakness of students in the knowledge of how to implement the procedures of the mechanism of access to research journals of scientific court	3.82	0.38	High
5	The suffering of PhD students from published research decision as a condition to discuss their thesis	3.81	0.39	High
6	The student suffers from difficulty in choosing the title of his thesis, and determining the challenges of his study	3.80	0.39	High
7	Absence of research awareness in the study sample, which affects the results of the study	3.79	0.40	High
8	Students suffer from the temperament of arbitrators when judging research in the journal	3.78	0.41	High
9	Lack of awareness among students about how to write scientific research according to the specifications of the scientific journals	3.75	0.43	High
10	Students suffer from a lack of lists of studies that have been presented in the section of repeated subjects	3.72	0.45	High
First domain :Research Challenges		**3.80**	**0.22**	**High**

The results indicated that the domain (research challenges) ranked first, with an average of (3.80), and a standard deviation (0.22), and to a degree (high). This result may be due to the constant suffering of students since attempting to choose the supervisor and determine the title of the thesis, the process of planning the thesis, and what steps to follow in composing the thesis, the publication of the research paper, and then discussing his thesis. All of the mentioned steps are steps that most students suffer from when there is no guide that led them accurately. This is consistent with the following paragraphs: Paragraph (1): "The student suffers from the slow process of the journals to respond to acceptance or rejection only after a long time". Paragraph (2) "Students face difficulty in convincing the members of the discussion committee of the thesis scheme problem study". Paragraph (3) "The weakness of students in how to extract research according to the publication specifications of the scientific journals". Paragraph (4) “The weakness of students in the knowledge of how to implement the procedures of the mechanism of access to research journals of the court ", and Paragraph (5) "The suffering of doctoral students from the decision published research as a condition to discuss their thesis".

In addition to the slow process of the journals to respond to acceptance or rejection, which usually takes a long time, and this, is considered a burden on the student because obtaining a letter of acceptance for publishing the research paper is a condition for discussing the thesis. Another matter is the fact that some students do not have enough information of how to compose or to submit the research properly and to which authority he should send the thesis. As for the paragraph that states that" there are no lists of studies presented in the section, "which came at a (high) degree. This result attributed to the weakness of the knowledge of the sample to what is required from them. The researcher is required to show the members of the sample the usefulness of the desired study and clarify the tool and the credibility required through their answers to them. The results of this study agreed with the results of Nenty

(2009), Darawsha and Abdal'al (2017), which came at a (high) level. It differs from the result of Salem study (2017), which came to a (moderate) degree.

The Second domain (Students challenges)

Table 5: Mean and standard deviations of the domain (students' challenges)

No.	Items	Mean	Standard deviations	Rank
1	Weak experience of the student in the use of statistical methods conforming the study.	4.15	0.98	High
2	Students' weakness in the English language.	3.85	1.13	High
3	Students' lack of subjecrive accuracy in obtaining the scientific material and the sources.	3.71	0.45	High
4	Weakness of the students' level of the student in research skills and its methods .	3.70	0.45	High
5	Students' benefit from the supervisor's observations on his thesis and improvement is low	3.69	0.46	High
6	student 's weak response to academic advisor guidance and observations .	3.62	0.99	High
7	Student's busiy cometments towards his job and family.	3.60	0.98	High
8	Seeking certificate on the cost of the production of knowledge.	3.59	0.49	High
9	Student's weak performance especially in his major	3.47	1.14	High
The second domain (student challenges)		**3.71**	**0.37**	**High**

The results show that the domain (students' challenges) came at the second rank with mean (3.71) and standard deviation of (0.37), high degree. The research attributed this high rank to the challenges facing the graduate students through their studying stages although they study the courses (quantitative research and analytic statistic) as obligatory required courses. It is presented in a theoretical way rather than applicable which lead to facing difficulty while writing their thesis especially in the field of statistical processing e.g. analyzing tool. Some students belief that these two courses are not enough to handle the difficulties they face, though their skills in the methods of scientific research will be limited except for the student who is studying Statistic which is the main major. On the other hand, students who are weak in English skills, as seen by the researcher is attributed to the fact that all the studying courses are taught in Arabic language which affect students acquisition of English language as a consequence. They will not be able to choose new thesis subject at a globe level because they cannot communicate in English. Two paragraphs state that "the pursuit of certificates without concern for the production of knowledge" (weakness of student's achievement, especially in the area of specialization).

This high result is also attributed to the fact that most students want to improve their standard of living and social status that makes the student accept any specialization accepted at the university without regard to his desire for this specialization that includes the extent of the need for the labor market for this field. Regardless of which all the students need is to obtain the highest scientific certificate, which makes the student's language and knowledge in the field of specialization as accepted. It may also due to the student's inability to upgrade himself and to keep up him the topics of his specialization and the strengthening his linguistic and cognitive achievements. The results of this study agreed with the results of Nenty (2009), Darawsha and

Abdal'al (2017). The result of this study differed with the result of the study of Al Salem (2017) which came to a (moderate) degree.

The third domain: Academic challenges.

Table 6: The Mean and standard deviations of domain (Academic challenges)

No.	Items	Mean	Standard Deviation	Level
1	Increasing the teaching load of faculty members, which affects the time allocated to supervise the messages and thesis of graduate students.	3.78	0.41	High
2	Shortage of qualified academic members to supervise postgraduate students.	3.77	0.42	High
3	The faculty member supervise many thesis and dissertations, which is an obstacle to his work.	3.66	1.12	High
4	Poor contribution of the supervisor in proposing subjects suitable for student research, research paper and dissertations.	3.65	1.03	High
5	The student must pass the cognitive proficiency test in order to start his / her scientific thesis	3.59	0.98	High
6	The supervisor's lack of commitment to office hours permanently	3.53	0.91	High
7	Differences of views and intellectual directions between academic supervisor and graduate student	3.51	.97	High
8	Difficulty in giving students enough time by the supervisor when they meet them.	3.44	1.16	High
9	The Academic Supervisor is busy with travelling:(attending seminars and conferences).	3.43	1.13	High
10	Lack of attention by the supervisor to help the student and guide him if necessary.	2.39	0.83	Moderate
Third domain :Academic challenges		**3.48**	**0.65**	**High**

Table 6 shows that the mean for this domain ranged between (2.39 - 3.78) that reached a moderate to high level. The researcher attributed this to the increased number of students applying for graduate programs in comparison with the decreasing number of academic staff. This has a negative impact on the allocated time for supervising research of the graduate students. Generally, the result of this study met with the studies of Nenty (2009), Darawsha and Abd al'al (2017) in which the result came at high degree, whereas it differs with Al-Salem study which came with (moderate) degree.

The results and the discussion of the second question*: "Are there statistically significant differences at the level of significance (0.05 = α) for the estimated challenges facing the graduate students from their point of view that due to the variables(gender, study program, full-time study) ?"*

To answer this question, the averages and the standard deviations were calculated to estimates the study sample (graduate students) for the challenges they face as a whole, according to the variables (gender, the study program and the full time study). As shown in Table (8)

Table 8: averages and standard deviations according to the variables of the demographic study

Variables	Statistics	Students' challenges	Research challenges	Academic challenges	Total Tool
Gender					
Male	Mean	3.7349	3.5542	3.4604	3.6140
	No.	149	149	149	149
	Standard deviation	.36408	.72766	.65634	.39094
Female	Mean	3.7502	3.6022	3.4852	3.6338
	No.	283	283	283	283
	Standard deviation	.37106	.71731	.65053	.37242
Total	Mean	3.7449	3.5856	3.4766	3.6269
	No.	432	432	432	432
	Standard deviation	.36832	.72042	.65188	.37857
Full –time study					
Full-time study	Mean	3.7338	3.5592	3.4591	3.6129
	No.	198	198	198	198
	Standard deviation	.36596	.72754	.65096	.38468
Apart –time study	Mean	3.7543	3.6081	3.4915	3.6388
	No.	234	234	234	234
	Standard deviation	.37083	.71512	.65369	.37374
Total	Mean	3.7449	3.5856	3.4766	3.6269
	No.	432	432	432	432
	Standard deviation	.36832	.72042	.65188	.37857
Study program					
Master	Mean	3.7465	3.5914	3.4767	3.6263
	No.	86	86	86	86
	Standard deviation	.37091	.72220	.65613	.38061
PhD	Mean	3.7445	3.5842	3.4766	3.6271
	No.	346	346	346	346
	Standard deviation	.36821	.72101	.65178	.37862
Total	Mean	3.7449	3.5856	3.4766	3.6269
	No.	432	432	432	432
	Standard deviation	.36832	.72042	.65188	.37857

Table 8 shows an apparent discrepancy in the mean and standard deviations of the challenges facing the postgraduate students in the educational sciences faculties in the Jordanian universities, according to the variables due to the variables because of the differences in variable categories. To illustrate the significance of the statistical differences between the mean averages a Three-way ANOVA was used as shown in table(9)

Table (9) Analysis of Multivariate analysis of variance (MANOVA) of the effects of the study variables on the challenges faced by postgraduate students in the educational sciences faculties in Jordanian universities

Effect	MANOVA	Test value	f	Numerator df	Denominator df	statistical significant
Gender	Hotelling's Trace	.002	.189(a)	5.000	424.000	.967
Study program	Wilks' Lambda	.998	.163(a)	5.000	424.000	.976
Full-time study	Wilks' Lambda	.999	.121(a)	5.000	424.000	.988

Table (9) shows that there are no statistically significant differences for the challenges faced by postgraduate students in the educational sciences faculties in Jordanian universities, due to the study variables (gender, program and full - time) as follows.

Table (10) ANOVA of the impact of study variables at the level of challenges facing graduate students in educational sciences faculties in Jordanian universities

Source of Variance	Domains	Sum of squares (SS)	df	Mean squares	Calculated f	statistical significant
Gender	Student related challenges	.004	1	.004	.027	.870
	Research challenges	.139	1	.139	.266	.606
	Academic challenges	.008	1	.008	.019	.891
Total tool		.004	1	.004	.029	.865
Study program	Student related challenges	.027	1	.027	.201	.654
	Research challenges	.281	1	.281	.540	.463
	Academic challenges	.054	1	.054	.127	.722
Total tool		.031	1	.031	.214	.644
Full-time study	Student related challenges	.023	1	.023	.166	.684
	Research challenges	.046	1	.046	.088	.766
	Academic challenges	.054	1	.054	.125	.724
Total tool		.035	1	.035	.242	.623
Error	Student related challenges	58.396	428	.136		
	Research challenges	223.135	428	.521		
	Academic challenges	182.986	428	.428		
Total tool		61.666	428	.144		
Total		Student related challenges	6116.980	432		
		Research challenges	5777.857	432		
		Academic challenges	5404.690	432		
Total tool			5744.611	432		

The results of this study showed that there was no differences due to the variables of the study of the challenges faced by the graduate students due to the impact of gender, the study program, and full - time study.

As for the gender variable, the results of the study showed that there were no differences due to gender variable. The researcher attributed this finding to the student as a student, regardless of gender, the program he studies and his full-time study. Students define the challenges they suffer from according to their scientific ability and individual differences. The results of this study agree with The study Aqel (2010), Al Salem (2017), and Darawsha and Abd al'al (2017), which showed no differences in the graduate students' perceptions of the challenges they faced due to the variable gender. However, it differs with Nenty (2009) which indicated differences due to variable gender.

As for the study program variable (Master Thesis Track, PhD), the results show that there are no differences due to the variable of the program. This result is because the student in both programs is striving to continue his studies in his natural form so that he can pass the educational stage. The student may be academically distinguished and get high grades because of his intensive effort of studying and follow-up, but when applying the steps of the thesis he faces many difficulties in overcoming them. This is because he focuses on a traditional way of memorizing without seeking research and investigation to gain knowledge that makes him focus on the theoretical part rather than the applied one in writing the proposal and criticizing

it. This led to the preceding challenges. On the other hand, a student of low achievements and who studies a part time succeed in overcoming these challenges because of his efforts and his academic supervisor directions in all the needed stages of establishing the thesis.

The results of this study correspond to Al Salem (2017), and the study of Darawsha and Abd al'al (2017) which shown that there is no difference in the perceptions of the graduate students of the challenges facing them. This result differs with the study of Nenty (2009) which indicated differences due to the variable of full-time study.

Finally, the results of the study showed that there were no differences due to the variable of the study program. This may attribute to the student's effort and the student's self-reliance. Although a student may have full-time study and has not any other work, he faces academic and research difficulties. Yet, a student who is a part-time student may make more effort to obtain knowledge. This result was consistent with the study of Al Salem (2017), and the study of Darawsha and Abd al'al(2017), which showed that there is no difference in the perceptions of graduate students of the challenges facing them. This contradicts with the study of Nenty (2009) which indicated differences due to the full-time program variable.

Results related to the third question and discussed: *What are the most prominent solutions proposed to reduce the challenges faced by graduate students in the faculties of educational sciences at Jordanian universities?*

In order to answer this question, the frequency and percentage of responses from the sample of the study were extracted on this open question, as shown in the following table.

Table (11) Frequency Table and Percentage of Sample (master and doctoral students) Descending by Frequency of Response to Question 3 (N = 50)

No.	Answers	Frequency	Percentage
1	That the publication of research is not the condition for discussion of the student's proposal, but a condition for the receipt of university documents.	24	15.89%
2	Give statistical material in an applied manner to graduate students on the statistical spss program	23	15.23%
3	Reducing the teaching load for thestaff members who are supervising the preparation of university research paper to have sufficient time to guide students during the message phase	23	15.23%
4	To establish a certain basis by the student's supervisor when writing the the thesis shows that the student relied on himself in the preparation of his proposal	17	11.26%
5	Provide students with Applied Training on planning scientific research ,documentation and how to discuss the thesis scientifically in the academic stages and to discover the student's strengths and weaknesses.	15	9.93%
6	Focus on practical materials over the theoritical material .	14	9.27%
7	Increase cooperation between supervisor and student in order to improve the message	10	6.62%
8	held training workshops to help students write thesis, especially doctoral students in comprehensive program	10	6.62%
Total		151	100.00%

It is obvious from the responses of the study sample (master and doctoral students) that the highest percentage obtained the answer stated (That the publication of research is not the condition of the student to discuss his thesis, but a condition for receiving the university

documents.) with frequency (24) and percentage (15.89%) The rest of the responses ranged between (6.62% - 11.26%).

The researcher believes that this result matches with the students' responses towards the issues they suffer from during their study. The high result for this paragraph corresponds to the first paragraph as shown in the table frequency on the response "That the publication of research is not the condition for discussion of the student's proposal, but a condition for the receipt of university documents". Thus, it stems from the suffering of the student on how to write the research and the procedures of publication as well as suffering from the length of the period of the Journal response to the student acceptance or rejection. Surprisingly, he may receive a letter of rejection, because the student was not prepared to establish a scientific research paper correctly. Otherwise, the research may not be in an acceptable scientific quality that lead to rejection. Therefore, the student's answers were high on this decision (to be a condition for graduation and not for discussion). The student has plenty of time to practice his research work and to benefit from his experiences in the case of rejection. However, the areas that are rejected by the student have not been accompanied by the reason for refusal in order for the student to benefit from his mistakes.

Following this is the second paragraph, which states, "the statistical material shall be given in an applied manner to the graduate students on the statistical SPSS program". This includes the paragraph "to reduce the load of teaching staff members supervising the preparation of university letters to have sufficient time to guide students during the stage of the thesis" with percentage (15.23%) corresponding to high degree. This result is due to students suffering through the analysis phase because of his inability to handle the statistical data that forces him to request assistance from libraries and an analyst, which constitute a double material burden on the student. This is due to the fact that, the study courses concentrate on the theoretical phases with no concern to student benefit who at the discussion period will stare at the statistical figures without having sufficient knowledge in answering the questions of the arbitrators of the thesis. This is because these data are obtained only without understanding the content, and often even in discussing the results; the student is forced to ask for assistance from others to explain the statistical figures because of his ignorance of statistical matters.

The last ranked paragraphs were (increasing cooperation between the supervisor and the student to improve the thesis and held training workshops to help students write the thesis, especially doctoral students) of the same (6.62%). The researchers may attribute this result to the pressures of teaching and supervision burdens faced by faculty members, and the student's suggestion stems from the shortage of the time a faculty member may provide for a student to follow up, supervise and provide continuous assistance. The result of this question matches the result of the study of Nenty (2009), Al Salem Study (2017), and Darawsha and Abd al'al (2017), which discussed in particular some of the challenges that students have suffered in the field related to research.

Recommendations

Based on the findings of the study, the researcher recommends the following:

- Recommending to the Higher Education Council that acceptance of publication should not be considered a prerequisite for discussing the thesis
- Qualifying and training students on how to write thesis and extract scientific research, through the involvement of students Porsche training to help students to write messages and extract results.
- Reducing the teaching load of the member of the academic staff who are responsible for supervising the masters/doctoral thesis so that they could supervise postgraduate students efficiently.
- Involving the new academic staff members in workshops and professional development on supervising research paper with the aim of expanding the supervisory responsibility base so that the number of research students corresponds to the number of supervisors.

References

Al - Ajiz, P, and Nashuan, c (2005). *The Problems Facing Students of Studies in Palestinian Universities, A Study Day entitled "Graduate Studies in Palestinian Universities in Light of Contemporary Challenges*", Islamic University, Gaza.

Abu Ela, L (2015). Academic Problems Facing Master Students in the Faculty of Education, Taif University. Al-Quds Open University Journal for Educational Studies and Research, 3 (10), 288-223 Adrian,R and Roy,J (2005)Effective postgraduate supervision improving the students/supervisor relationship.Open university Press.Mc Grow Hill Education,England.

Al-Moghrebi, A (2012). *The problems faced by students in the research of the Department of Islamic Education and Comparative Education at the Faculty of Education, Umm Al-Qura University*. (Unpublished master thesis), Makkah, Saudi Arabia.

Al Salem, S. (2017). The problems faced by students of higher education in Jordanian public and private universities in preparing their messages and dissertations from their point of view and the view of the heads of departments (unpublished master thesis), Middle East University, Jordan

Aqel, E (2010). *The study problems facing the graduate students at the Islamic University in Gaza, and ways to overcome them*. (Unpublished master thesis), Faculty of Education, Islamic University of Gaza.

Barro, R & Lee,d (2013) '*A New Data Set of Educational Attainment in the World, 1950–2010'*, Journal of Development Economics .104,184–198.

Darawsha, N, Abdal'al, M. (2017). *The problems faced by graduate students in the faculties of education in Jordanian universities in completing the requirements of publishing research based on their thesis from their point of view*: and proposals for their development. The First International Conference in the Development of Scientific Research - Deanship of Scientific Research and Graduate Studies - Amman Arab University, 20-22 / 5/2017: p. (287- 310).

Fakih, A. (2006). *Facts: Has Saudi Petroleum University emerged from the global rankings?* Http://www.mktml.com/ib/lofiversion/index.php/t7586.html

Nenty,H. (2009).*Research Orientation and Research-Related Behaviour of Graduate Education Students.* Journal of Social Sciences. 9(1),9-17.

Shu-Yuan Lin, S & Scherz , S(2014). *Challenges Facing Asian International Graduate Students in the US: Pedagogical Considerations in Higher Education*. Journal of International Students, 4(1), pp. 16-33

Sunqer, p. (1994). *Postgraduate studies in Arab universities, their components, and their role in achieving development.* Damascus, Arab Center for Research on Higher Education.

Vehviläinen,S.(2009).Problems in the Research Problem: Critical Feedback and Resistance in Academic Supervision. Scandinavian Journal of Educational Research. 53(2): 185-201

Young, S (2014). *Does a master's degree make you any more employable?* https://www.independent.co.uk

The Importance of University Education in Developing, www.educationalpathwaysinternational.org

Meeting Industry's Requirements: A study on the IT Graduate Employability Indicators

Benqing Dong

China-ASEAN International College, Dhurakij Pundit University, Bangkok 10210, Thailand
Department of Computer Science and Technology, Dalian Neusoft University, Dalian116023, China

Chia-Ching Tu

China-ASEAN International College, Dhurakij Pundit University, Bangkok 10210, Thailand

ABSTRACT

While the rapid development of the information technology / computer industry has greatly promoted economic development, Chinese IT companies put forward higher requirements for employment standard and employability of computer major graduates. Existing studies on the employability indicators have placed a strong focus on the soft skill requirements such as time management, teamwork and so on. This research proposed an extended IT-specific employability indicator model by adopting soft skill indicators and further including professional IT skill indicators. By using the Delphi questionnaire method, this research conducted the survey with IT companies and technical personnel. The research outcome suggests that the IT industry indeed placed an equal focus on both the soft and professional skills.

Keywords: Chinese Information Technology, employability, soft skills indicators

Introduction

As an important part of the modern high-end service industry, the computer industry is based on information technology and promoted by information productivity (Melville, Kraemer, & Gurbaxani, 2004). It has the characteristics of low resource consumption, less environmental pollution, high output, large added value, and high level of internationalization (Xu, 2012). The computer industry's pulling effect on the economy is very obvious, and it plays an important role in the absorption of the labor force and the widening of employment channels (K. Zhu, Kraemer, Xu, & Dedrick, 2004). The computer industry is the primary factor in evaluating a country's scientific and technological level, and its development is the primary technical field for realizing a powerful country with science and technology (Kozma & Voogt, 2003). At present, the shortage of computer talents, unreasonable talent structure, and the severe shortage of international talents have seriously hampered the development of the computer industry (J. H. Wang & Lee, 2007). At the same time, the scale of enrollment in Chinese universities continues to expand, the number of university graduates continues to rise, and the employment situation has reached an unprecedented severity(Cai & Wang, 2010).

Although the supply and demand of computer talents in the labor market are in a state of insufficient supply, the gap in the degree of match between supply and demand in the market is increasing, which is due to the lack of employability of computer major graduate (D. Wang, Liu, & Lai, 2012). Therefore, the promotion of employability of computer major graduate has received extensive attention from government departments, IT companies, and computer practitioners, and the academic community has also conducted corresponding research on the employability of college students. Under the current background of the development of the computer industry, the employability level of computer major graduate not only reflects the level of personal training in universities but also has important significance in promoting the healthy and rapid development of the computer industry (Zhiwen & van der Heijden, 2008). Therefore, the employability of computer major graduate has become an important issue for computer talent training.

This research hopes to assess the importance of various employability indicators from the industry's perspective. The research outcome hopes to better improve future IT education.

Literature review

Overview of the IT / computer industry in China

This study has placed a specific focus on the graduate employability in China IT / computer industry. In the 21st century, the IT industry has entered a new period of development in which communications, computers, networks, and information are fully integrated (J. Zhu & Li, 2017). After decades of struggle, China's IT industry has achieved considerable development. In 2017, the added value of electronic information manufacturing industry above designated size increased by 13.8% over the previous year, and the growth rate was 3.8 percentage points higher than that in 2016; faster than the growth rate of all above-scale industries by 7.2

percentage points, and accounted for 7.7% of the industrial added value above designated size. The nationwide software and information technology services industry completed a software business income of 5.5 trillion yuan, an increase of 13.9% over the previous year, and the growth rate was 0.8 percentage points higher than the same period last year.

However, compared with the strongest countries in the information industry such as Europe, the United States, Japan and South Korea, China's IT industry is controlled by people in key core technologies, and the technological innovation system based on enterprises has yet to be formed, and its ability for independent innovation is weak. For a long time, many industries in china are faced with the embarrassment of the lack of core technology. For example, the electronic information industry has faced the dilemma of lack of processor and screen for many years. The largest amount of imported goods in China is not oil, but rather fingernail-sized chips. At present, 90% of China's chip demand depends on imports. Most of them are imported from the United States. In 2016, the cost of imported chips alone exceeded 230 billion dollar in China.

Referring to the labor market, in 2017, the number of IT employees in China was close to 6 million, an increase of about 200,000 over the same period of last year, and an increase of 3.4% over the previous year. The overall quality of IT industry personnel is not high. High-end talents, especially the Experts with innovation and leadership skills as well as Comprehensive management talent with international perspective and familiar with the development of the industry, are in shortage, which have become a major hidden danger in the development of China's information industry. According to the Ministry of Education, the Ministry of Human Resources and Social Security, and the Ministry of Industry and Information Technology in the 'Manufacturing Talent Development Planning Guide', the new generation of information technology talents is in great demand. By 2020, the demand for personnel in the new generation of information technology industry is 18 million people and currently have a shortfall of 7.5 million people. By 2025, China needs 20 million people for a new generation of information technology, with a gap of 9.5 million people, which is a huge gap. Therefore, it is important to understand the IT graduate employability in order to improve the existing IT education and better prepare the students to serve the industry.

Predecessors' definition of employability

Different researchers will have different perspectives on research and then come up with different connotations or definitions, but no matter what the definition is, it refers to a student's ability to obtain work (Harvey, 2001). From the perspective of scholars' research, Hillage and Pollard (1998) believe that employability is an ability to realize individual potential through obtaining continuous employment. Robinson (2000) pointed out from the perspective of professional identity that employability is the individual's ability to obtain, maintain, and perform a certain job, specifically including interpersonal and decision-making skills. Rothwell and Arnold (2007) believe that employability is the ability to obtain and maintain their ideal career. Fugate, Kinicki, and Ashforth (2004) and others believe that employability is the ability to enable individuals to better adapt to the changes brought about by the current economy and

is a specific positive adaptability that enables individuals to identify and realize career development opportunities.

From the point of view of employment structure, McQuaid and Lindsay (2005) believe that the structural elements of college students' employability include the basic social attributes of individuals, personal attitudes, basic communication skills, and teamwork skills. Carnevale (1990) has conducted an in-depth analysis of the ability structure of employability, and defined its composition as five factors: basic skills, communication skills, problem-solving skills, and teamwork skills. , leadership and other aspects.

The Employment Skills Survey Committee of the US Department of Labor (Commission, 1991) pointed out that the ability structure for adapting to professional needs should include three foundations, namely, the foundation of ability, the foundation of thinking, and the foundation of quality. The Australian Industry Council and Business Council (ACCI/BCA, 2011) proposed that undergraduate employability should include communication skills, teamwork skills, problem solving skills, leadership skills, self-management skills, continuous learning skills, and skills to use technology. Forrier and Sels (2003) believes that college students' employability is a professional ability combined with personal ability and professional expectation. Law, Wong, and Mobley (1998) believes that employability consists of personal adaptability, individual ability to demonstrate ability, and professional identity. Fallows and Steven (2000) defined the composition of employability as four aspects: information ability, communication ability, problem solving ability, and social relationship development capability. Yorke* and Knight (2004) breaks down the employability into professional understanding (knowledge); skills (including key skills); self-efficacy (including self-development awareness); metacognition (including the ability to learn how to learn), and this analysis is also very representative. In the study of the employability of computer science college students, ACM & IEEE-CS (IEEE, 2016) studied the computer professional curriculum system and proposed that computer science students need to cultivate 4 professional capabilities such as computer thinking ability, algorithm design and analysis capabilities, program design and implementation capabilities, and system capabilities.

Gokuladas and Menon (2014) summarized previous studies and proposed that employees of the IT / computing industry require more in-depth knowledge that mainly integrates social factors and elements (such as practical application and technology) from professional works. These employees need to have professional skills for work and comprehensive qualifications for the society. In order to choose suitable candidates from science and engineering graduates, Gokuladas and Menon (2014) found that employers mainly consider the factors such as fitness to the company, personal characteristics, convertible skills, professional strength and other hard skills. The fitness includes the individual maturity, cultural understanding, and language skills. Convertible skills include innovation ability, potential leadership, problem solving ability, teamwork and personal attitude and motivation. Hard skills include a variety of professional and job-related techniques.

Taking the IT professional / hard-skill requirements into consideration, the extended literature review suggests that the new IT employability indicator model may include the following indicators (as summarized in Table 1).

Table 1: Computing students' employability structure model summary

Literature	**Computing students' employability structure**
Hillage and Pollard (1998)	"Employment capital", composed of students' knowledge, skills and attitudes; "performance", refers to the ability of college students show their knowledge, skills and attitudes in the process of job seekers; "planning", refers to the occupation career management capability and strategic capability; "environment" refers to the personal background and labor market conditions.
Bennett et al. (1999)	The five-element model of employability structure: one is the knowledge of a specific specialty; two is a specific professional skill; three is vocational consciousness; four is occupation (practice) experience; five is general ability.
Yorke and Knight (2004)	The USEM model of employability structure: professional understanding (knowledge); skills (including key skills); self-efficacy (including self-development awareness); metacognition (including learning how to learn)
Dacre Pool & Sewell (2007)	CareerEDGE model of employability structure: first, professional knowledge, cognition and skills; two is general skills; three is EQ; four is career development knowledge; five is social work experience.
Ruth Bridgstock (2009)	The model points out that the employability of college students consists of five components: Students' personality and personal characteristics, specific professional skills, general competence, self-management ability and career development ability.
Washington Accord (2017)	Containing 12 aspects under four dimensions of "knowledge dimension", "ability to solve engineering problems dimension", "general ability dimension", and "attitude dimension"
CDIO Initiative (2010)	Technical knowledge and reasoning; Personal and professional skills and attributes, interpersonal skills; Teamwork and communication; Conceiving, Designing, Implementing and Operating systems in the enterprise and societal context.
ABET EC2000(2012)	Apply knowledge of mathematics, science and engineering; Design and construct experiments, as well as to analyze and interpret data; Design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability; Function on multi-disciplinary teams; Identify, formulate and solve engineering problems; Understanding of professional and ethical responsibility; Communicate effectively; The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context; Recognition of the need for, and an ability to engage in life-long learning; A knowledge of contemporary issues; An ability to use the techniques, skills and modern engineering tools necessary for engineering practice.
ACM/IEEE-CS Computing Curricula (2017)	Specifying to professionally basic ability, it includes Computational Thinking、Algorithm Design and Analysis、Program Design and Implementation、System Understanding and Mastery. And System Understanding and Mastery still consists of cognition, design, development and application.
IEET CAC (2016)	Innovation and application of information technology and mathematical knowledge. The ability to implement computing skills and modern tools using. Design and evaluate the capabilities of computerized systems, programs, components or programs. Project management, effective communication, domain integration and teamwork. Explore, analyze, apply research results and complex and integrated consulting issues. Study current events, acknowledge the impact of information technology environment, society and the world, and develop the capacity for continuous learning. Understand and comply professional theory, recognize social responsibility and respect multiple views.

Research Design

Proposed IT Industry focused employability Indicators

By aggregating the above potential employability indicators from Table 1, in total 26 indicators were used in this research (Table 2).

Table 2: Proposed IT employability indicators

No	Indicator	No	Indicator
1	Planning ability	14	Problem solving ability
2	Career planning ability	15	Professional ethics and responsibility
3	Hands-on ability	16	Basic knowledge of computer
4	Organization and teamwork ability	17	Cognitive and operational capability of computer components and hardware
5	Communication and coordination	18	Cognitive and operational capability of software theory
6	adaptability	19	Computational thinking and modeling capabilities
7	Using social relations capabilities	20	Algorithm design and analysis capabilities
8	Executive ability	21	Computer hardware design and development capabilities
9	Learning ability	22	Ability of computer software design and program development
10	Creativity	23	Understanding of knowledge and processes in the application domain
11	Comprehension and expression	24	General ability to use and maintain computer application systems
12	Skills of analyze	25	Basic design capability of computer application system
13	Pressure resistance	26	Capability to apply computer for implementing apply system and conducting development and innovation

Stage One - Delphi-study Data Collection

Delphi-study is used to verify the indicators. In total, 18 computer industry experts with 10 years or more were invited to fill in the questionnaire to make a preliminary selection of the factors and eliminate factors that obviously do not satisfy the requirement of study. Keep the required feature elements and supplement the elements not involved in the community to form *Alternative factor pool for evaluating employability of computer major graduates*. After three rounds of discussions, a pre-study questionnaire was designed and pre-tests were conducted in Beijing, Dalian, Chengdu, and Guangzhou. The on-site anonymous questionnaires were used, and the data obtained will provide direct basis for the adjustment of the questionnaire and the establishment of the final evaluation index system. The reasons for selecting IT companies and universities in Beijing, Dalian, Chengdu, and Guangzhou for research are as follows: First, the four regions are all economically developed regions in the country. Beijing and Dalian belong to the urban representatives of the northern Pan-Bohai Bay economic zone. Beijing is the largest gathering place for research of information industry in China, and it is in a leading

position. Dalian is a National demonstration base for information industry. Both of two cities have advanced computer industries. Chengdu is a leading benchmarking city for the development of electronic information industry in the central and western regions. Shenzhen is a typical representative of economically developed cities in the eastern coastal areas. The choices of the four places reflect both the common features of the economically developed regions and the geographical differences between the north region and the south region of china. Second, the four places are the areas with advance level of education in China. Beijing is the most concentrated area of China's higher education resources. Therefore, the sample taken from these areas is of high representativeness.

Stage Two – Survey Data Collection

Based on the Delphi-study results (confirmation of the validity of indicators), this research takes the second-stage of conducting a large-scale survey questionnaire. The research object of this paper is computer industry practitioners such as IT companies or Project manager of computer business in the enterprise, enterprise senior manager, the industrial management of government and social organization, computer professional teacher. The computer practitioners are very complex and extensive, and all computer practitioners form the theoretical body of this article. The survey was conducted by all computer practitioners. To make the sample of the survey representative, the survey of the study started from the beginning of March 2018. The research is conducted mainly through three channels: First, with Association of Fundamental Computing Education in Chinese Universities, it is distributed to the cooperative companies through an online electronic questionnaire. A total of 1485 questionnaires were recovered from this type of questionnaire. Secondly, the company and computer practitioners, who are familiar to the author, use WeChat, QQ, and e-mails to distribute questionnaires with the basic background and intent of the study in their companies, and successfully retrieved 321 questionnaires. The third is to directly visit the company through my own, issue 350 questionnaires and recover 225 copies. As of March 31, 2018, a total of 2031 questionnaires were received. A preliminary examination of the questionnaire revealed a total of 189 unqualified questionnaires, all of which were removed. 45 questionnaires in the disqualification questionnaire were incomplete. In addition, there are almost no differences in the choice of answers for the different items in the 86 questionnaires of the unqualified questionnaire. There were also 58 questionnaires filled in by the subcontract questionnaire. The time for filling out the questionnaire was short, less than 5 minutes. After removing the unqualified questionnaires, 1842 effective samples were obtained, and the effective questionnaire recovery rate was 85.44%.

Result and Discussion

Stage One – Delphi-Study Results

During the Delphi-study, expert participants were asked to rank individual indicators using a 5-scale score (Most important 5 to least important 1). Table 3 shows the round 1 result. The

number in the table indicates the total count that Delphi participants gave to the individual indicators.

Table 3: Delphi Expert Round 1 Scores

No	Indicator	Most important	important	Average importance	Not important	Least important
1	Planning ability	3	10	5	0	0
2	Career planning ability	7	10	1	0	0
3	Hands-on ability	3	6	8	1	0
4	Organization and teamwork ability	7	7	3	1	0
5	Communication and coordination	16	2	0	0	0
6	adaptability	2	7	6	3	0
7	Using social relations capabilities	4	8	6	0	0
8	Executive ability	7	8	3	0	0
9	Learning ability	8	6	4	0	0
10	Creativity	6	6	5	1	0
11	Comprehension and expression	2	6	10	0	0
12	Skills of analyze	3	4	9	2	0
13	Pressure resistance	6	8	4	0	0
14	Problem solving ability	3	3	10	2	0
15	Professional ethics and responsibility	10	7	1	0	0
16	Basic knowledge of computer	6	8	4	0	0
17	Cognitive and operational capability of computer components and hardware	6	8	4	0	0
18	Cognitive and operational capability of software theory	3	7	8	0	0
19	Computational thinking and modeling capabilities	10	7	1	0	0
20	Algorithm design and analysis capabilities	12	5	1	0	0
21	Computer hardware design and development capabilities	6	8	3	1	0
22	Ability of computer software design and program development	11	7	0	0	0

23	Understanding of knowledge and processes in the application domain	1	5	11	1	0
24	General ability to use and maintain computer application systems	11	6	1	0	0
25	Basic design capability of computer application system	4	12	2	0	0
26	Capability to apply computer for implementing apply system and conducting development and innovation	8	7	3	0	0

Based on the aggregated scores, the researchers proposed a three-level IT employability indicator classification system to all 18 participants. It is noted that the total number of indicators have dropped to 21 due to low scores and feedback from the expert. In total, 3 indicators are dropped due to over-lapping (embedded in other indicators such as planning, etc) including:

- skill of analyze
- problem-solving and
- comprehension and expression

Further, it is also interesting to note that the Chinese experts do not value the following indicators as important employability indicators:

- hands-on
- adaptability

It is like due to the factor that Chinese IT companies often provides in-workplace training before starting new employees with official duties).

With their input, 21 indicators were included in the Delphi round with the aim to reach a consent for the levels and related indicators. The result is shown below:

Table 4: Three-levels 21 IT employability indicators

Primary indicator	**Secondary indicators**	**Third-level indicator**
Professional ethics and accomplishment	Values and ability to withstand stress	Professional ethics and sense of responsibility
		Pressure resistance
	Career achievement	Career achievement
Foundation and development capability	Planning and planning capabilities	Planning ability
		Career planning ability
		Organization and teamwork ability

	Teamwork and communication skills	Communication and coordination
		Using social relations capabilities
	Development ability	Learning ability
		Executive ability
		Creativity
Computer professional ability	Computer principle cognition, operational ability	Basic knowledge of computer
		Cognitive and operational capability of computer components and hardware
		Cognitive and operational capability of software theory
	Computer system theory design and development capability	Computational thinking and modeling ability
		Algorithm design and analysis capabilities
		Design capability of computer hardware
		Computer software design and program development capabilities
	The use and innovation of computer application systems	General ability to use and maintain computer application systems
		Basic design capability of computer application system
		Capability to apply computer for implementing apply system and conducting development and innovation

Stage 2 – Survey Results

Among the 1842 effective samples of the survey, respondents' work units were concentrated in state-owned enterprises, foreign-invested enterprises, and private enterprises, and the distribution was relatively even. Respondents' work unit size was 39.5%, 23.9%, and 36.6% for large, medium, and small enterprises, respectively. The proportion of the respondents' work location is 32%, 32.6%, and 34.7% respectively in the capital cities or municipalities directly under the Central Government, county-level cities, or county cities. The geographic area of the work area is 61.2% in the east, 21.4% in the middle, and 17.4% in the west. From the individual sample attributes, women accounted for 43.4%, men accounted for 56.6%, slightly more men than women. The age group is concentrated in 20-39 years old, of which 20-29 years old accounted for 64.0% and 30-39 years old accounted for 33.0%. In terms of career composition, the majority of computer engineering technicians account for 82.2% of the total sample population. Judging from the level of education, the number of colleges and undergraduates accounted for more than 90% of the total number of samples. The above sample distribution meets the needs of this study.

After testing, the KMO values of the Professional Ethics and Responsibility Scale, the Basic and Development Capacity Scale, and the Professional Capacity Scale were 0.915, 0.932, and 0.929, respectively. The statistical average of the indicators was greater than 0.90. The significant probability value was $0.000<0.05$. This shows that the meter is very effective and suitable for factor analysis. After inspection, the reliability coefficient of the questionnaire as a whole is 0.927, indicating that the scale has good consistency, stability, and reliability.

Based on the collected data, the researchers have calculated the importance value (I value) and performance value (P value), then the difference between importance and the performance the calculated (I-P value), in order to understand the difference between the two. To further analyze the differences between the company's demand-side expectations and actual evaluations, a paired sample T-test was conducted on the importance and performance of the 21 factors. The two-tailed significance probabilities were calculated to determine whether there was a significant difference between a pair of data (Sig < 0.05 indicates a significant difference). Calculate the T value as the sample value for the paired sample t test and determine whether the null hypothesis is accepted by comparing the actual value of the statistic obtained from the sample with the statistical value at a significant level (0.01 or 0.05). Professionally, two tailed P value (significance value) is a decreasing indicator of the degree of credibility of the results. The larger the p value, the less we can think of the association of variables in the sample as a reliable indicator of the association of variables in the population. The two tailed p-value is the probability that the observations will be considered valid, that is, the overall probability of error. According to the Statistical significance test method, the two tailed P value that is smaller than 0.05 generally indicts significance, while the two tailed P value which is smaller than 0.01 generally indicts very significance. The meaning is that the difference between samples due to sampling error is less than 0.05 or 0.01 (Zarutskie, 2008). In many areas of research, a two tailed p-value of 0.05 is often considered to be an acceptable marginal level

Table 5 shows the importance of 21 employability and the performance of the mean, difference, T value and two-tailed significant probability. The results showed that under the 95% confidence interval, the two-tailed significance probabilities of the 21 indicators were all less than 0.05, indicating that there is a statistically significant correlation between these factors, there are significant differences, which are suitable for IPA analysis. In addition, from the results, it is found that the difference of all 21 factors is positive, indicating that the performance of the 21 demand factors of the enterprise demand side is lower than the expected value. From the results of performance (satisfaction) results, the average of the 21 evaluation indicators was between 2.706 and 3.725, with a total average of 3.184.

Table 5: Significance difference in satisfaction factors – Survey Results

No	Measurement Elements	Measurement indicators	I value	P value	I-P value	T value	Two-tailed significance probability
1	Professional ethics and Responsibility	Pressure resistance	4.198	2.998	1.200	18.175	0.000
2		Professional ethics	4.097	3.489	0.608	15.910	0.000
3		Career achievement	4.069	3.547	0.522	16.319	0.000
4	Basic and Development ability	Executive ability	4.186	3.214	0.972	19.726	0.000
5		Learning ability	4.266	3.526	0.740	19.818	0.000
6		Creativity	4.210	3.025	1.185	16.172	0.000
7		Planning ability	4.207	3.114	1.093	17.628	0.000
8		Career planning ability	4.162	3.145	1.017	21.217	0.000
9		Organization and teamwork ability	4.219	3.662	0.557	15.997	0.000

10		Communication and coordination	4.164	3.111	1.053	21.539	0.000
12		Using social relations capabilities	3.149	2.832	0.317	12.764	0.000
13	computer Professional ability	Basic knowledge of computer	4.093	3.200	0.893	19.942	0.000
13		Cognitive and operational capability of computer components and hardware	3.826	3.276	0.550	15.945	0.000
14		Cognitive and operational capability of software theory	4.331	3.725	0.606	18.549	0.000
15		Computational thinking and modeling capabilities	4.090	3.257	0.833	17.828	0.000
16		Algorithm design and analysis capabilities	4.129	2.706	1.423	21.091	0.000
17		Computer software design and program development capabilities	4.119	2.821	1.298	20.903	0.000
18		Basic knowledge of computer	3.857	3.169	0.688	20.881	0.000
19		Capability to apply computer for implementing apply system and conducting development and innovation	3.840	3.170	0.670	18.579	0.000
20		Basic design capability of computer application system	3.600	3.009	0.591	15.894	0.000
21		Design capability of computer hardware	3.357	2.885	0.472	11.539	0.000
	Mean		4.013	3.184	0.829	18.150	0.000

Unlike the generic employability indicators (including Law, Wong, and Mobley (1998), Forrier and Sels (2003) and ACCI/BCA (2011) - – discussed in the early section), which has placed a primary focus on the graduates' soft skills, this research has provided 21 indicators covering both essential soft skills (adapted from the literature review) and professional IT-based skills. The survey data analysis points out that the IT industry indeed placed an equal focus on both the soft and professional skills. For example, the most important indicators (A-level) consists of both IT / computer knowledge and soft skills such as teamwork, etc. It is possible to extend this finding to other industries (combining both soft skills with domain-specific skills) in order to develop accurate employability indicators across different disciplines.

Limitations and Future Research

Although the research in this paper has drawn some meaningful conclusions, the IT employability of is a multi-factor, multi-variable complex system. The difference in the characteristics of the subjects are not studied. For example, computer major graduates and computer industry practitioners are not completely same. Computer hardware companies and software companies, as well as other types of service companies, have significant differences in employability requirements. The limitation requires a special study on the evaluation of the employability of a certain type of computer industry, and even a certain class of computer majors in future research. Future research includes both trait research and comparative research.

Conclusion and Recommendation

This research centered on the topic of study on the employability structure of IT / computer majors graduates, using a research strategy combining theoretical research and empirical research. This research uses literature analysis to derive preliminary employability indicators (Table 2) and uses Delphi questionnaire to verify. Based on relevant research in china and abroad, based on the first-hand data from the employers' perspectives, the establishment and empirical results of the computer professional graduates' employability index system were studied in depth and systematically, which intuitively demonstrated the true evaluation of employability of computer major graduates by demand-side companies:

By using the Delphi-study and survey questionnaire, this paper established an evaluation system for employability from the industry perspective. Based on the theoretical research on the factors of the employability of computer majors, this paper uses the methods of expert appraisal to preliminarily construct the evaluation index for the employability of computer major graduates and uses factor analysis to test the sample data empirically. Finally, structural index system of employability of the computer professional graduates with its own characteristics are built. The system includes three dimensions (such as professional ethics and responsibility, basic and developmental capabilities, computer professional competence), and 21 tertiary indicators. These indicators can provide guidance to the next generation IT tertiary education program design.

References

ACCI/BCA. (2011). *Employability Skills for the Future*. AUSTRALIA Retrieved from http:// www.decs.sa.gov.au/learningandwork/ files/links/final_report.pdf.

Agency, O. M. C. (2018). 2017 Electronic Information Manufacturing Operations. Retrieved from http://www.miit.gov.cn/n1146312/n1146904/n1648373/c6048688/content.html

Beavers, A. S., Lounsbury, J. W., Richards, J. K., Huck, S. W., Skolits, G. J., & Esquivel,

S. L. (2013). Practical considerations for using exploratory factor analysis in educational research. *Practical assessment, research & evaluation, 18*.

Cai, F., & Wang, M. (2010). Growth and structural changes in employment in transition China. *Journal of Comparative Economics, 38*(1), 71-81. doi:https://doi.org/10.1016/j.jce.2009.10.006

Carnevale, A. P. (1990). *Workplace basics: The essential skills employers want. astd best practices series: training for a changing work force*: ERIC.

Commission, S. (1991). What work requires of schools: A SCANS Report for America 2000. *Washington, DC: The Secretary's Commission on Achieving Necessary Skills, US Department of Labor*.

Ennew, C. T., Reed, G. V., & Binks, M. R. (1993). Importance-performance analysis and the measurement of service quality. *European journal of marketing, 27*(2), 59-70. doi:https://doi.org/10.1108/03090569310026402

Enright, M. J., & Newton, J. (2004). Tourism destination competitiveness: a quantitative approach. *Tourism management, 25*(6), 777-788. doi:10.1016/j.tourman.2004.06.008

Fallows, S., & Steven, C. (2000). Building employability skills into the higher education curriculum: a university-wide initiative. *Education+ Training, 42*(2), 75-83. doi:10.1108/00400910010331620

Forrier, A., & Sels, L. (2003). The concept employability: a complex mosaic. *International journal of human resources development and management, 3*(2), 102. doi:10.1504/ijhrdm.2003.002414

Fugate, M., Kinicki, A. J., & Ashforth, B. E. (2004). Employability: A psycho-social construct, its dimensions, and applications. *Journal of Vocational behavior, 65*(1), 14-38. doi:10.1016/j.jvb.2003.10.005

Gokuladas, V., & Menon, S. (2014). " Hired for Attitude and Trained for Skills": Engineering Graduates' Employability in Indian Software Services Industry. *IUP Journal of Soft Skills, 8*(2), 21.

Han, C. (2015). *Research on the Evaluation of Engineering Students' Entrepreneurial Ability.* The University of Science and Technology Beijing.

Harvey, L. (2001). Defining and measuring employability. *Quality in higher education, 7*(2), 97-109. doi:10.1080/13538320120059990

Hillage, J., & Pollard, E. (1998). *Employability: developing a framework for policy analysis*: DfEE London.

IEEE, A. (2016). *Joint Task Force on Computer Engineering Curricula*. Retrieved from https://www.acm.org/binaries/content/assets/education/ce2016-final-report.pdf

Jiang, Q., & Wang, X. (2004). The Situation of Informatization Talents and the Challenges Facing China: China Talent Development Report.

Kozma, R. B., & Voogt, J. (2003). *Technology, innovation, and educational change: a global perspective: a report of the Second Information Technology in Education Study, Module 2*: ISTE (Interntl Soc Tech Educ.

Law, K. S., Wong, C. S., & Mobley, W. H. (1998). Toward a taxonomy of multidimensional constructs. *Academy of management review, 23*(4), 741-755. doi:10.5465/amr.1998.1255636

Li, Q. (2015). *Research on Graduate Quality of Employment for Science and Engineering Masters.* The University of Science and Technology Beijing.

Ma, S. (2015). *Study on the Structural Evaluation of Full-time Master of Engineering.* The University of Science and Technology Beijing.

Martilla, J. A., James, J. C. (1977). Importance-performance analysis *Journal of Marketing, 41*(1), 77-79. doi:10.2307/1250495

McQuaid, R. W., & Lindsay, C. (2005). The concept of employability. *Urban studies, 42*(2), 197-219. doi:10.1080/0042098042000316100

Melville, N., Kraemer, K., & Gurbaxani, V. (2004). Review: Information technology and organizational performance: An integrative model of IT business value. *MIS quarterly, 28*(2), 283-322.

O'Neill, M. A., & Palmer, A. (2004). Importance-performance analysis: a useful tool for directing continuous quality improvement in higher education. *Quality assurance in Education, 12*(1), 39-52. doi:10.1108/09684880410517423

Robinson, J. P. (2000). What are employability skills. *The workplace, 1*(3), 1-3.

Rothwell, A., & Arnold, J. (2007). Self-perceived employability: development and validation of a scale. *Personnel review, 36*(1-2), 23-41. doi:10.1108/00483480710716704
Rovai, A. P., Baker, J. D., & Ponton, M. K. (2013). *Social science research design and statistics: A practitioner's guide to research methods and IBM SPSS*: Watertree Press LLC.

Van der Heijde, C. M., & van der Heijden, B. I. (2005). *The development and psychometric evaluation of a multi-dimensional measurement instrument of employability—and the impact of aging.* Paper presented at the International Congress Series. doi:10.1016/j.ics.2005.02.061.

Wang, D., Liu, D., & Lai, C. (2012). Expansion of higher education and the employment crisis: policy innovations in China. *On the Horizon, 20*(4), 336-344. doi:10.1108/10748121211272470

Wang, J. H., & Lee, C. K. (2007). Global production networks and local institution building: the development of the information-technology industry in Suzhou, China. *Environment and Planning A, 39*(8), 1873-1888. doi:10.1068/a38428

Williams, B., Onsman, A., & Brown, T. (2010). Exploratory factor analysis: A five-step guide for novices. *Australasian Journal of Paramedicine, 8*(3).

Xu, X. (2012). *Study on the Development of Service Outsourcing Industry Based on Industrial Agglomeration.* Wuhan University of Technology.

Yorke*, M., & Knight, P. (2004). Self-theories: some implications for teaching and learning in higher education. *Studies in Higher Education, 29*(1), 25-37. doi:10.1080/1234567032000164859

Zhiwen, G., & van der Heijden, B. I. (2008). Employability enhancement of business graduates in China: Reacting upon challenges of globalization and labour market demands. *Education+ Training, 50*(4), 289-304. doi:10.1108/00400910810880533

Zhu, J., & Li, F. (2017). Research on International Cooperation Model and Policy of lT Industry in China under the Background of "One Belt One Road". *Macroeconomic management*(11), 23-28.

Zhu, K., Kraemer, K. L., Xu, S., & Dedrick, J. (2004). Information technology payoff in e-business environments: An international perspective on value creation of e-business in the financial services industry. *Journal of management information systems, 21*(1), 17-54. doi:Doi 10.1080/07421222.2004.11045797