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Pedagogical Innovations in Universities: A Critical Agenda

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Abstract

This article presents the empirical findings of a study on the profile of pedagogical innovations using the SITES-M2 framework. A total of 248 subjects responded to the questionnaire survey available in online and printed versions. The results revealed that the study population has not reached the critical value of being "innovative" in their pedagogical practices. None of the demographic variables were significant moderator to the subjects' pedagogical innovation. Supportive plans and policies that form the strategy of technology integration within the faculty were the most significantly correlated to subjects' pedagogical innovativeness. It was highlighted that university leaders ought to align curriculum design and technology integration to support student-centred learning.

Keywords: *Pedagogical Innovations, pedagogical practices, strategy of technology integration, student-centred learning*

Introduction

Pedagogical innovation is a central issue to the global educational innovations movement. Integration of technology can be a means to support pedagogical innovations. Higher education institutions around the world are spending billions of dollars to integrate technology into enhancing the quality of pedagogical practices. In Malaysia, many higher education institutions have adopted a similar approach. In outlining the National Higher Education Action Plan 2007-2010 (2007), the Ministry of Higher Education stressed that the "development of quality human capital will be intensified. The approach must be holistic and emphasise the development of knowledge, skills, intellectual capital in fields such as science, technology and entrepreneurship" (National Higher Education Action Plan 2007-2010, 2007).

Pedagogical innovation can be described as instruction delivery that allows for two-way, dynamic communication between the instructor and learners, as well as among the learners in the learning communities, field experts, and practicing professionals (Kettunen, 2011). One of the key enablers of innovative pedagogy is the presence of technology that drives innovation through real-time communications among learners that share common intellectual interests. According to Biggs (2003), traditional teaching methods such as the lecture, tutorial and private individual study do not provide much support for the development of the skills required for higher-level learning processes. This shift to student-centred learning is liberating and that the

quality of teaching can be enhanced by aligning objectives, teaching styles and assessment tasks.

Theoretical Framework

Some of the exemplary pedagogical practices and profiles are reported in '*Educational Innovations beyond Technology: Nurturing Leadership and Establishing Learning Organisations*' by Law, Yuen and Fox (2011). Law et al. (2011) further stressed that although computers are very common, pedagogical practices in the classroom have largely remained traditional in most countries and education systems.

Pedagogical innovation was measured using the Second Information Technology in Education Study Module 2 (SITES-M2) six dimensions of pedagogical innovations that had been developed by Law et al. (2005). The original instrument was grounded on the SITES-M2 findings from the international comparative study of innovative pedagogical practices involving 28 countries.

Law (2003) and Law et al., (2005) reported that there are six dimensions that must be considered when research on pedagogical innovations is carried out. These consist of: (a) Learning Objectives; (b) Teacher's Roles; (c) Student's Roles; (d) ICT used; (e) Multiplicity of learning outcomes exhibited; (f) Connectedness.

The findings of Ertmer (1999) and Owston (2003) have formed the ten organisation and faculty's beliefs referred as the mediating variables in this study.

This study sought to answer the following research questions:

1. What are the profiles of pedagogical innovativeness among the HEIs subjects?
2. Is there a significant relationship between pedagogical innovativeness profile and demographic variables?
3. Is there a significant relationship between pedagogical innovativeness profile and organisation and faculty's beliefs?

Methodology

This research adopted a simple random sampling survey method. All the subjects invited were informed of the available options of printed and online questionnaires.

Pedagogical innovations were interpreted through the levels of pedagogical innovativeness adapted from the SITES-M2 six dimensions framework. The profiles of pedagogical innovativeness among the HEIs subjects were also presented from the SITES Ms six dimensions framework.

Data for ICCM was collected using Likert scale (1 to 5) in an 18-item instrument embedded in the questionnaire. Descriptive statistics are used to demonstrate the

overall pedagogical innovativeness level as well as trend analysis by the six dimensions. Inferential statistics are used to analyse the relationship between pedagogical innovativeness and demographic variables. Pearson correlation tests are used to analyse the relationship between pedagogical innovativeness and organisation and faculty's beliefs.

Results

Empirical data from 248 subjects working as fulltime academic staff was collected, compiled, coded and analysed using SPSS software. There were 248 subjects responded to the questionnaire of this study. Demographic variables in this study comprised of faculty discipline, gender, age group, teaching experience, highest level of academic qualification and academic position held.

All the subjects work in universities that are ranked as Tier 5 based on the report of rating system of Malaysian Higher Education Institutions 2011 (MQA, 2011). Pedagogical innovativeness of subjects in this study is analysed in the following sequence: overall subjects (*N* = 248) (Table 1) and by subjects' demographic profiles (Table 2).

The mean score of pedagogical innovativeness of the population of study is 63.47 which is interpreted as more than emergent (minimum score of 54) but not yet innovative (minimum score of 72).

Table 1
Pedagogical Innovativeness of HEI on Six Dimensions of Innovations

	Mean Score (*SD*)						
Dimension	Overall	HEI A	HEI B*	HEI C	HEI D	HEI E	HEI F
Learning Objectives	12.38 (2.17)	12.26 (2.34)	12.33 (2.20)	13.10 (1.88)	11.92 (2.23)	12.09 (2.18)	12.55 (2.02)
Teacher's Roles	10.65 (2.81)	10.98 (3.25)	11.42 (2.52)	10.48 (2.58)	10.45 (2.68)	9.88 (2.89)	10.64 (3.48)
Students' Roles	10.63 (2.66)	10.81 (3.00)	10.81 (2.35)	11.37 (2.54)	10.50 (2.45)	8.94 (2.78)	10.91 (2.26)
ICT Used	11.52 (2.51)	12.52 (2.19)	11.49 (1.81)	11.58 (2.78)	11.03 (2.51)	10.72 (2.95)	12.45 (1.92)
Connectedness	8.26 (3.18)	8.02 (3.56)	8.02 (3.20)	8.08 (3.11)	8.43 (3.29)	8.31 (2.75)	9.91 (2.43)
Multiplicity of learning Outcomes Exhibited	10.06 (2.92)	10.57 (3.26)	9.56 (2.70)	10.67 (2.49)	10.23 (2.84)	8.44 (3.13)	10.45 (3.08)

Note: *one subject from HEI B did not fill up this section

Pedagogical innovations profile of the population of study is further presented in a radar diagram as depicted in Figure 1. It is clearly demonstrated that for the population of this study (N = 248), the mean values of six dimensions of pedagogical innovations are presented by respective markers. Subjects in this study had the highest mean value for the "learning objectives" dimension (M = 12.38, SD = 2.17). This is followed by the "ICT used" dimension (M = 11.52, SD = 2.51). The dimension "teachers' roles" (M = 10.65, SD = 2.81) had slightly higher mean value than "students' roles" (M = 10.63, SD = 2.66). "Multiplicity of learning outcomes" had mean value of 10.06 (SD = 2.92) while the "connectedness" dimension had the lowest mean value (M = 8.26, SD = 3.18).

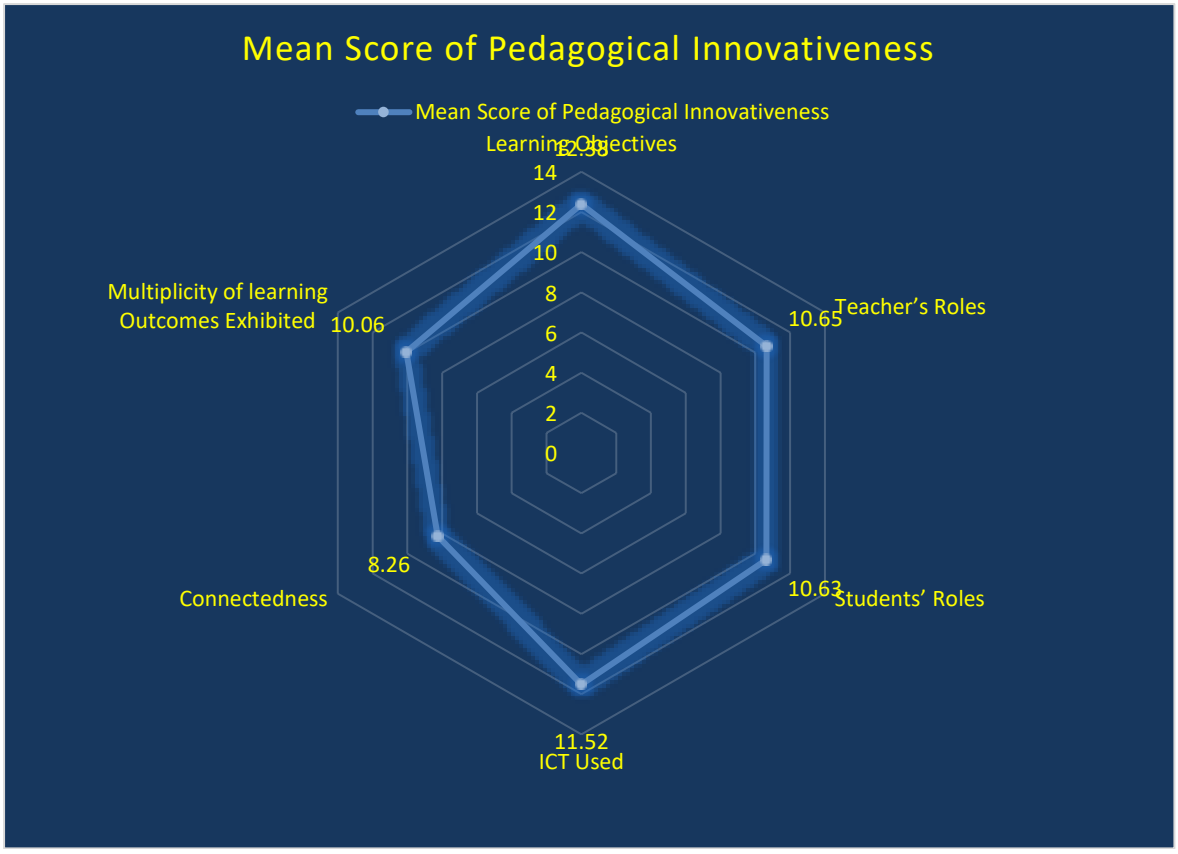

Figure 1: Pedagogical Innovation profile of Study population

None of the six demographic variables has significant effect on subjects' pedagogical innovativeness (Table 2).

Table 2
Univariate Analyses and Effect Size Estimation for Demographic Variables and Pedagogical Innovativeness

Variable	*F*	*df1*	*df2*	*Sig.*	*Effect size* η^2
Faculty Discipline	.401	1	245	.527	.002
Gender	.140	1	245	.709	.001
Age Group	.434	4	242	.784	.007
Teaching Experience	.592	5	241	.706	.012
Highest Level of Academic Qualification	.765	7	239	.618	.022
Academic Position	1.786	6	240	.103	.043

Note: Correlation is significant at $p < .05$

All the ten organisation and faculty's beliefs variables were significant mediators for subjects' pedagogical innovativeness, with *r* values greater than 0 (Table 3).

Table 3
Organisation and Faculty's Beliefs and Partial Correlation with Pedagogical Innovativeness

Organisation and Faculty's Beliefs	*Pedagogical Innovativeness*	
	Partial correlation r	*Sig.*
Support is always available among faculty members to integrate technology into pedagogical practices	.246**	.000
Sufficient professional development for faculty members	.206*	.001
Excellent infrastructure that supports students to use technology to learn	.163*	.012
Technology Integration is a valuable means for faculty members	.189*	.003
Excellent Administrative support for faculty to facilitate technology integration	.215*	.001
Prominent technology leader that drives the initiative of technology integration	.259**	.000
Supportive plans and policies that form the strategy of technology integration within the faculty	.331**	.000
Sufficient time to implement technology integration projects	.288**	.000
Support from external agencies	.274*	.000
Strong support from the university top management	.179*	.005

Note: *significant at $p < .05$ level, **significant at $p < .001$ level

By controlling the demographic variables, there was a significantly mild positive correlation between pedagogical innovativeness and the ten mediating variables identified in this study (r values were ranging from .163 to .331, $p < .05$). The variable 'Supportive plans and policies that form the strategy of technology integration within the faculty' has the strongest correlation to pedagogical practises of faculty members.

Discussion and Recommendations

The pedagogical innovation profiles based on SITES-M2 six dimension show that the population of study has barely reached the 'innovative' level. This asserts that the country as a whole needs to embrace further educational technology development in the areas of having more supportive plan and strategies to engage faculty members to use technology effectively, matching curriculum with the right ICT tools and engaging external experts in collaborative learning. The leaders of universities need to devise strategic plan in ensuring the pedagogical practises of faculty members and curriculum designs are truly aligned to facilitate student-centred learning. Technology integration should also play its critical role in unleashing innovative pedagogical practises that will benefit the faculty members, students as well as the university.

The study on pedagogical innovation is context-specific. The Malaysian Tier 5 universities have long established their reputation as research intensive universities. The proposed six dimensions of pedagogical innovation based on SITES-M2 by Law and colleagues (2011), requires further validation through longitudinal studies.

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