A Gender Study of Work Based Learning and Innovation in Medium and Large Companies: An investigation of International Commerce degree students

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Abstract

Empirical findings are reported concerning innovative thinking and behaviour by female and male students who have participated in a Work Based Learning (WBL) module on an International Commerce degree involving a dual higher education concept, which integrates academic studies and work place training. Similarities and differences in the perception of innovative activity between female and male students are investigated and an approach is presented that can be used to provide rigorous analysis of innovative activity. The research method involved a qualitative methodology to formulate indicators of the characteristics and behaviours that contribute towards innovative WBL for female and male students.

Key words: gender, work based learning, innovation, companies, international commerce students

Introduction

The paper presents empirical findings regarding innovative thinking and behaviour by female and male students who have participated in a Work Based Learning (WBL) module on an International Commerce degree involving the dual higher education concept (Baden-Wurttenberg CSU, 2011). Through integration of work place training and academic studies students are able to maximise their graduate employability. Accordingly, this research investigates the similarities and differences in the perception of innovative activity between female and male students when participating in WBL on internship in a company as part of their course. The aim of the investigation is to provide greater understanding of the gender dimension of student characteristics and behaviours that contribute towards innovative working.

Early research reported in the extant literature concerning WBL and gender painted negative connotations concerning gender issues relating to self directed learning (Brennan and Little, 1996). This was on the basis that research into gender differences and learning conveyed categories of epistemological development for women (Belenky et al., 1986). The category concerning knowledge

noted the receiving of knowledge but not the creation of knowledge which most academics nowadays would see as the antithesis to self directed learning. Although wrongly conceived in this early work the orientation towards self directed learning, and especially WBL needs to recognise the potential relevance of the differences in gender (Taylor and Burgess, 1995) not on the basis of gender disadvantages but to the benefits that can arise from gender differences. This is well illustrated in recent findings (LSIS, 2012) where it has been found that 64 percent of WBL staff are female and 36 percent male compared to 61 percent female in the lifelong leaning sector (Lifelong Learning UK, 2010) conveying the success of female participation in the WBL arena.

For this research we have adopted the generally accepted definitions of WBL, which according to Hills et al (2003; 2004) encompasses "learning outcomes achieved through activities which are based in, or derive from, the context of work or the workplace". Moreover, Nixon et al (2006) describe WBL as "learning which accredits or extends the workplace skills and abilities of employees". In these terms WBL "acts as a driver for innovation in the HE system …", "enabling innovation, enterprise and creativity" and "hence, not only is knowledge being transferred to and from the workplace but students are creating new knowledge through reflection and practice, innovation and creativity" (Nixon et al, 2006).

This study initially explores the model enunciated by Patterson et al (2009) concerning employee characteristics and behaviours towards innovative working and these include openness to ideas, problem solving, motivation/personal initiative, strategic thinking, leadership and management skills, self-belief/confidence, willingness to take risks, emotional intelligence and tolerance to ambiguity. This study compares and contrasts this model with the model used for assessing International Commerce degree students in Germany. Here students are assessed according to key skills including problem solving and decision making, numeracy and quantitative skills, communication and information technology, self management, learning to learn, self awareness and application of research skills to business and management issues. Their personal and vocational development is assessed through self reflection which illustrates innovative approaches and behaviour to solving problems. These innovative traits have also been assessed through vive voce which has provided evidence of the idea for their project, how the problem was investigated and how they transferred knowledge from their university studies, what innovative solution was provided in terms of recommendations, how the company implemented their ideas and how this related to their personal and vocational development.

Literature Review of WBL Innovation Models

According to Painter (2009) the literature indicates that work based learning and assessment is a complicated and evolving area for education providers and employers and tripartite assessment models of employer, student and higher education institution are probably the most appropriate. Moreover, different definitions and models of work based learning have been conceptualised in relation to institutions and assignments (Burke et al, 2009). As a consequence work based learning 'lacks systematic, sensibly conceptualised theorisation' (Tynjälä et al, 2003, p 150) with various models being adopted. In particular there are models of expansive learning (Engeström, 2004), knowledge building (Scardamalia and Bereiter, 1994), knowledge creation (Nonaka and Takeuchi, 1995), connective model (Guile and Young (1995), formative model of group working skills (Laybourn et al, 2001), and a model of the connection between education and working life in vocational skills (Stenström, 2009). Further to this Griffiths and Guile (2003, p 72) have evolved a typology of work experience models including traditional, experiential, generic, work process and connective models. By reviewing work based learning theory and practice it is apparent that there are evolving approaches through the development of new understanding leading to the formulation of different models. In this research we are particularly interested in innovation models of work based learning and those that are relevant are the NESTA model of innovative working (Patterson et al, 2009) and the HEA Workplace learning interrelationships model (Nixon et al, 2006).

The NESTA model (based on Patterson et al, 2009) (Figure 1) involves employee characteristics and behaviours that contribute towards innovative working and these are openness to ideas, problem solving, motivation/personal initiative, strategic thinking, leadership and management skills, self-belief/confidence, willingness to take risks, emotional intelligence and tolerance of ambiguity. In a survey undertaken by NESTA (Patterson et al, 2009) the five most common characteristics/behaviours were openness to ideas (59%), problem solving (50%), motivation/personal initiative (43%), strategic thinking (35%), leadership and management skills (33%) and the least most important were self-belief/confidence (29%), willingness to take risks (28%), emotional intelligence (13%) and tolerance of ambiguity (8%) (Table 1).

Figure 1: NESTA Model of Innovative Working
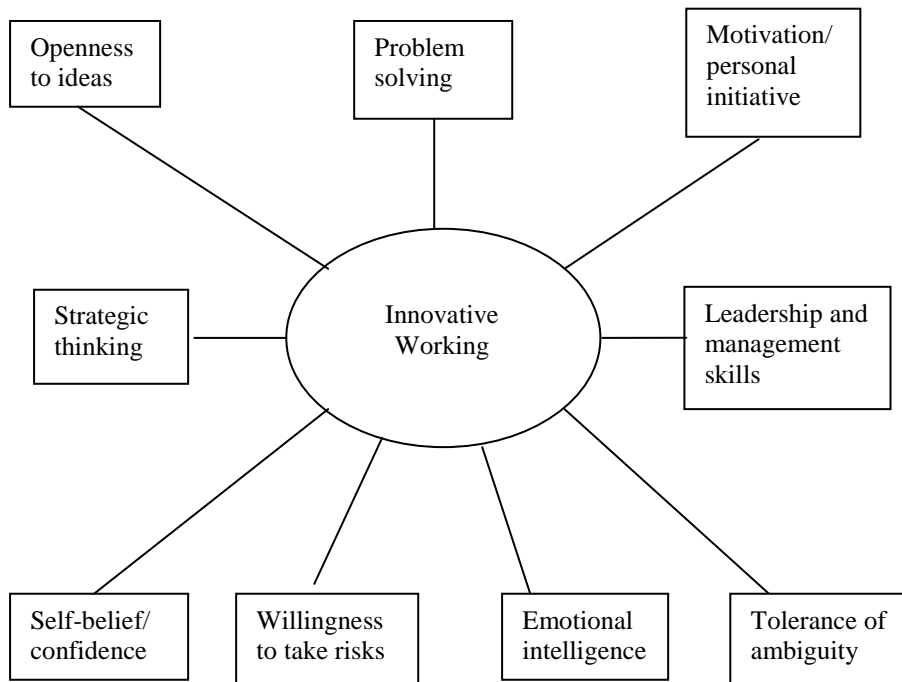
Source: based on Patterson et al (2009)

Table 1: NESTA Findings – Employee characteristics and behaviours that contribute towards innovative working

Characteristics and behaviours	% of whole sample agreeing that the characteristics and behaviours are important for innovative working
Openness to ideas	59
Problem solving	50
Motivation/personal initiative	43
Strategic thinking	35
Leadership and management skills	33
Self-belief/confidence	29
Willingness to take risks	28
Emotional intelligence	13
Tolerance of ambiguity	8

N=841, 9 respondents did not answer section of survey
Source: Patterson et al (2009)

A further model is the HEA Workplace learning interrelationships model (Nixon et al, 2006) Figure 2). In terms of the tripartite relationship of the learner, employer and education provider this shows the innovative activities (outcomes) of employer (productivity, innovation and workforce development), learner (skills and knowledge) and education provider (curriculum offer, research and innovation) (Table 2).

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Figure 2: HEA Workplace learning interrelationships model

Learner's life plan
(personal and career aspirations,
skills and knowledge)

Employer's business plan
(productivity, innovation and
workforce development)

Provider's corporate plan
(marketing, recruitment, access, curriculum
offer, research and innovation)
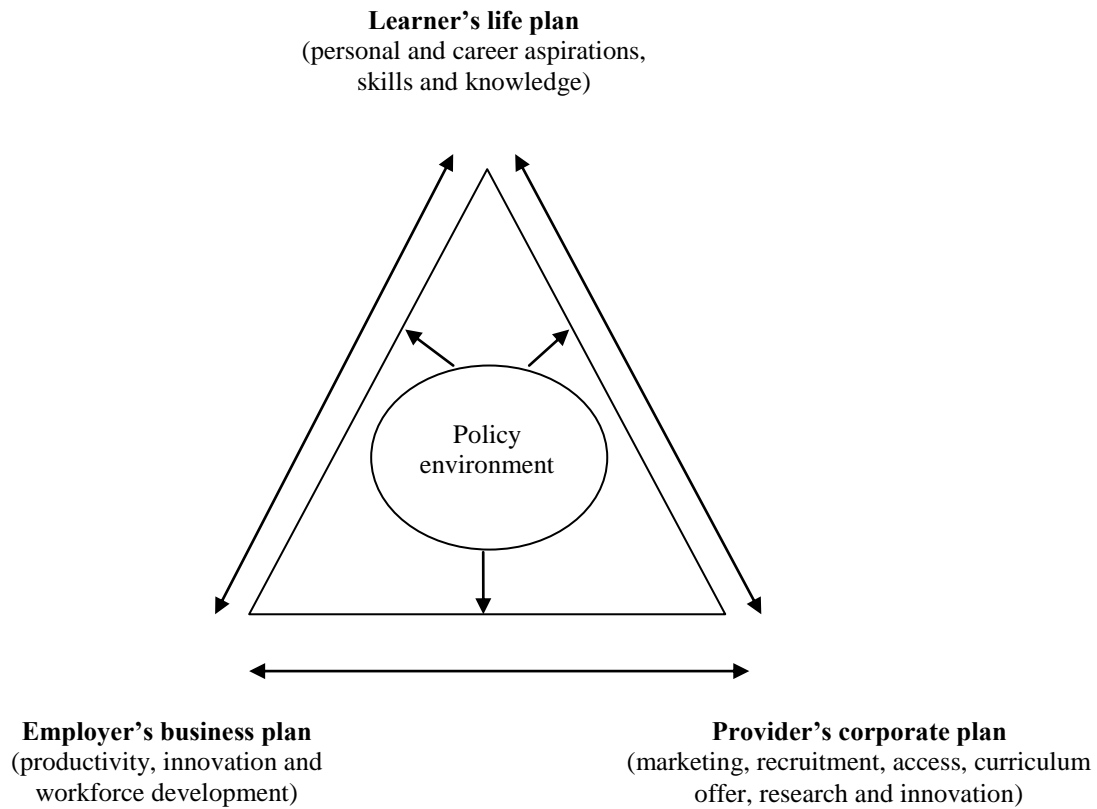
Source: Nixon et al (2006)

Table 2: HEA Workplace interrelationship plans and outcomes

Plans	Outcomes
Learner's life plan	Personal and career aspirations Skills Knowledge
Employer's business plan	Productivity Innovation Workforce development
Provider's corporate plan	Marketing Recruitment Access Curriculum offer Research Innovation

Source: based on Nixon et al (2006)

The above model of innovative working (Patterson et al, 2009), taking into consideration the workplace interrelationships model (Nixon et al, 2006), has been investigated through comparison with the Dual Education programme model and International Commerce degree model.

Research approach

The research method adopted to investigate the empirical evidence concerning the gender dimension of student characteristics and behaviours that contribute towards innovative working involved a qualitative approach (Cresswell, 2003; Clarke, 2005) underpinned by reflective practice, observation, one to one interviews and reflective journals. These demonstrate the similarities and differences in the perception of innovative activity between female and male students when participating in WBL on internship in a company as part of their course. The research was undertaken in three stages. For stage 1, as enunciated in the discussion of the extant literature, the study links with previous research conducted by Patterson et al (2009). In stage 2 the findings of the National Endowment for Science, Technology and the Arts (NESTA) model (Patterson et al, 2009) are compared with the Dual Education programme (Baden-Wurttemberg CSU, 2011) model (reflective essay findings) and the International Commerce degree model (UoG, 2008) (interview findings) to triangulate the results to formulate a gender based WBL innovation framework. This framework is explored in stage 3 according to the viva voce interview and reflective essay responses for female and male students and from this tabulation of the average percentages and rankings for female and male students as indicators that contribute towards innovative WBL. The findings and framework are reported in the research findings section below.

Research Findings

The first stage of the research investigated the extant literature and the identification of the NESTA model as a basis to research the gender dimension of the innovative aspects of work based learning by International Commerce degree students. The second stage compared the International Commerce degree and Dual Education Programme with the NESTA model and a sample of 40 students (20 female and 20 male) using the viva voce and reflective essay research instruments (n=40, f=20, m=20). These instruments used the same sample of students to provide anonymous reported findings. Table 3 shows the findings for the viva voce interview responses for female and male students on the course. For both female and male students leadership and management had the highest indicator score (f=50%, m=65%). Whereas for female students the second highest indicator score was self belief/confidence (45%), third problem solving (35%) and fourth emotional intelligence (30%) for male students the second highest indicator score was problem solving (20%) and third equal motivation/personal initiative and tolerance of ambiguity (10%). These were followed by openness to

ideas and motivation/personal initiative (25%), strategic thinking and tolerance of ambiguity (10%) and willingness to take risks (0%) for female students, and strategic thinking, self belief/confidence and emotional intelligence (5%), and openness to ideas and willingness to take risks (0%) for male students.

Table 4 provides the findings for the reflective summary responses for female and male students on the course. For female students the highest indicator score was problem solving (80%) followed by leadership and management skills (70%), emotional intelligence (55%) and openness to ideas (50%). For male students the highest indicator score was leadership and management (85%), followed by problem solving and emotional intelligence (70%) and self belief/confidence (50%). Whereas for female students the other indicator scores were motivation/personal initiative (45%), strategic thinking and self belief/confidence (40%), tolerance of ambiguity (30%) and willingness to take risks (20%), for male students the other indicator scores were openness to ideas and strategic thinking (45%), motivation/personal initiative (35%), and willingness to take risks and tolerance of ambiguity (both 20%).

Through comparing and contrasting the findings of the National Endowment for Science, Technology and the Arts (NESTA) model (Patterson et al, 2009) with the International Commerce degree model (UOG, 2008) (interview findings) and Dual Education programme (Baden-Wurttemburg CSU, 2011) model (reflective essay findings) it has been possible to provide a comparison of indicators of work based learning for female and male students (Table 5).

Through isolating and combining the findings for the viva voce interview responses and the reflective summary essays it has been possible to tabulate the average percentages and rankings as indicators that contribute towards innovative work based learning for female and male students (Table 6).

The indicators in Table 6 show leadership and management with the highest average rank (1) for both female and male students for the sample followed by problem solving (2), emotional intelligence (3) and self-belief/confidence (4). Whereas for female students these are followed by openness to ideas (5), motivation/personal initiative (6) and strategic thinking (7) for male students these are strategic thinking (5), motivational/personal initiative (6) (similar to female students) and openness to ideas (7). The last two average ranks for both female and male students are tolerance of ambiguity (8) and willingness to take risks (9).

By taking the first four rankings as core characteristics, the three middle rankings as intermediate and the last two rankings as peripheral these results have been used to formulate a gender category framework for innovative work based learning (Figure 3).

Table 3: Work Based Learning International Commerce degree Student characteristics and behaviours that contribute towards innovative working (viva voce responses)

	Student	Employee characteristics and behaviours that contribute towards innovative working for female students								
		Openness to ideas	Problem solving	Motivation/ personal initiative	Strategic thinking	Leadership & management skills	Self-belief/ confidence	Willingness to take risks	Emotional intelligence	Tolerance of ambiguity
F	1									
F	2									
F	3		√				√			
F	5					√	√			
F	6			√		√	√		√	
F	7			√						
F	9		√							√
F	13		√			√	√			
F	14	√	√	√	√					
F	15					√				
F	17		√		√	√	√		√	
F	18		√			√				
F	19	√					√			
F	26					√	√			
F	28		√						√	
F	29	√		√						
F	33			√		√			√	
F	34	√				√			√	√
F	37	√					√			
F	39					√	√		√	
	Total	5	7	5	2	10	9	0	6	2
	Percent	25	35	25	10	50	45	0	30	10
	Rank	5=	3	5=	7=	1	2	9	4	7=

	Student	Employee characteristics and behaviours that contribute towards innovative working for male students								
		Openness to ideas	Problem solving	Motivation/ personal initiative	Strategic thinking	Leadership & management skills	Self-belief/ confidence	Willingness to take risks	Emotional intelligence	Tolerance of ambiguity
M	4		√				√			
M	8									
M	10		√	√						
M	11					√				√
M	12		√			√				
M	16					√				
M	20					√			√	
M	21					√				
M	22					√				
M	23					√				√
M	24					√				
M	25			√						
M	27					√				
M	30					√				
M	31					√				
M	32									
M	35				√					
M	36		√			√				
M	38									
M	40					√				
	Total	0	4	2	1	13	1	0	1	2
	Percent	0	20	10	5	65	5	0	5	10
	Rank	8=	2	3=	5=	1	5=	8=	5=	3=

	Total	5	11	7	3	23	10	0	7	4
	Percent	12.5	27.5	17.5	7.5	57.5	25	0	17.5	10
	Rank	6	2	4=	8	1	3	9	4=	7

Table 4: Work Based Learning International Commerce degree Student characteristics and behaviours that contribute towards innovative working (reflective summary essay responses)

	Student	Employee characteristics and behaviours that contribute towards innovative working for female students								
		Openness to ideas	Problem solving	Motivation/ personal initiative	Strategic thinking	Leadership & management skills	Self-belief/ confidence	Willingness to take risks	Emotional intelligence	Tolerance of ambiguity
F	1	√	√	√					√	√
F	2			√						√
F	3	√	√			√	√		√	√
F	5		√		√	√	√			
F	6			√					√	
F	7					√				
F	9		√	√	√	√				
F	13	√	√							√
F	14	√		√		√				
F	15		√							
F	17		√		√	√	√	√	√	√
F	18		√			√				
F	19	√	√			√	√		√	
F	26		√	√		√		√		
F	28		√		√	√			√	
F	29	√	√	√	√	√	√	√	√	√
F	33	√	√	√	√	√	√		√	
F	34	√	√		√		√		√	
F	37	√	√			√			√	
F	39	√	√	√	√	√	√	√	√	
	Total	10	16	9	8	14	8	4	11	6
	Percent	50	80	45	40	70	40	20	55	30
	Rank	4	1	5	6=	2	6=	9	3	8

	Student	Employee characteristics and behaviours that contribute towards innovative working for male students								
		Openness to ideas	Problem solving	Motivation/ personal initiative	Strategic thinking	Leadership & management skills	Self-belief/ confidence	Willingness to take risks	Emotional intelligence	Tolerance of ambiguity
M	4		√		√	√	√			
M	8					√				
M	10	√	√		√					
M	11	√	√	√		√			√	
M	12		√			√			√	√
M	16		√			√				√
M	20	√	√	√	√	√				
M	21		√						√	
M	22		√			√				
M	23		√			√			√	
M	24		√	√		√	√	√	√	√
M	25					√	√		√	
M	27					√	√		√	
M	30	√	√	√		√	√	√	√	√
M	31	√	√	√	√	√		√	√	
M	32			√	√				√	
M	35	√	√		√		√		√	
M	36	√			√				√	
M	38	√	√	√	√	√	√	√	√	
M	40				√	√	√		√	
	Total	9	14	7	9	17	10	4	14	4
	Percent	45	70	35	45	85	50	20	70	20
	Rank	5=	2=	7	5=	1	4	8=	2=	8=

	Total	19	30	16	17	31	18	8	25	10
	Percent	47.5	75	40	42.5	77.5	45	20	62.5	25
	Rank	4	2	7	6	1	5	9	3	8

Table 5: Indicators of characteristics and behaviours that contribute towards innovative work based learning for Female and Male Students

Characteristics and behaviours important for innovative working	Interview % of sample	Interview Rank for sample	Interview % of Female	Interview Rank for Female	Interview % of Male	Interview Rank for Male	Essay % of sample	Essay Rank for sample	Essay % of Female	Essay Rank for Female	Essay % of Male	Essay Rank for Male
Openness to ideas	12.5	6	25	5=	0	8=	47.5	4	50	4	45	5=
Problem solving	27.5	2	35	3	20	2	75	2	80	1	70	2=
Motivation/personal initiative	17.5	4=	25	5=	10	3=	40	7	45	5	35	7
Strategic thinking	7.5	8	10	7=	5	5=	42.5	6	40	6=	45	5=
Leadership and management skills	57.5	1	50	1	65	1	77.5	1	70	2	85	1
Self-belief/confidence	25	3	45	2	5	5=	45	5	40	6=	50	4
Willingness to take risks	0	9	0	9	0	8=	20	9	20	9	20	8=
Emotional intelligence	17.5	4=	30	4	5	5=	62.5	3	55	3	70	2=
Tolerance of ambiguity	10	7	10	7=	10	3=	25	8	30	8	20	8=

Table 6: Average study rank for the indicators of characteristics and behaviours that contribute towards innovative work based learning for Female and Male Students

Characteristics and behaviours important for innovative working	Interview % of Female	Interview Rank for Female	Interview % of Male	Interview Rank for Male	Essay % of Female	Essay Rank for Female	Essay % of Male	Essay Rank for Male	Average % for Female	Average % for Male	Average Rank for Female	Average Rank for Male
Openness to ideas	25	5=	0	8=	50	4	45	5=	37.5	22.5	5	7
Problem solving	35	3	20	2	80	1	70	2=	57.5	45	2	2
Motivation/personal initiative	25	5=	10	3=	45	5	35	7	35	22.5	6	6
Strategic thinking	10	7=	5	5=	40	6=	45	5=	25	25	7	5
Leadership and management skills	50	1	65	1	70	2	85	1	60	75	1	1
Self-belief/confidence	45	2	5	5=	40	6=	50	4	42.5	27.5	4	4
Willingness to take risks	0	9	0	8=	20	9	20	8=	10	10	9	9
Emotional intelligence	30	4	5	5=	55	3	70	2=	42.5	37.5	3	3
Tolerance of ambiguity	10	7=	10	3=	30	8	20	8=	20	15	8	8

Figure 3: Gender Category Framework for the average study rank for the indicators of characteristics and behaviours that contribute to Innovative Work Based Learning

Category	Type of characteristic	Characteristics and Behaviours that contribute to innovative WBL	Average rank for female students	Average rank for male students
1	Core	Leadership and management skills	1	1
		Problem solving	2	2
		Emotional intelligence	3	3
		Self-belief/confidence	4	4
2	Intermediate	Openness to ideas	5	7
		Motivation/personal initiative	6	6
		Strategic thinking	7	5
3	Peripheral	Tolerance of ambiguity	8	8
		Willingness to take risks	9	9

Discussion

The findings show that there are differences and similarities with regard to the indicators of female and male characteristics and behaviours that contribute towards innovative work based learning. From the interview findings it is apparent that for both female and male students leadership and management skills have the highest score (50% for female and 65% for male). This is followed by self belief and confidence (45%), problem solving (35%) and emotional intelligence (30%) for females. Whereas for males the second highest score is problem solving (20%), followed by motivation/personal initiative (10%) and tolerance of ambiguity (10%). Although male students score a higher percentage for leadership and management skills female students score higher for all the other characteristics and behaviours that contribute to innovative work based learning. For the reflective essay findings there are some interesting differences concerning the characteristics and behaviours. Whereas for female students leadership and management skills (70%) are the second most important and problem solving (80%) the most important, for male students it is the other way around with problem solving and emotional intelligence (70%) the second most important and leadership and management skills the most important (85%). For female students emotional intelligence is third (55%) and openness to ideas fourth (50%), whereas self belief/confidence (50%) is the fourth for male students.

Conclusions/Implications

Conclusions can be drawn from the indicators of characteristics and behaviours that contribute towards innovative work based learning for female and male students. These are based upon the average percentages for the interview and essay findings and show that female and male students have the same average rankings for leadership and management skills (1), problem solving (2), emotional intelligence (3), self-belief and confidence (4), motivation/personal initiative (6), tolerance of ambiguity (8) and willingness to take risks (9). Other than leadership and management skills, which has an average ranking of 1 for both female and male students, where male students have a higher percentage (75%) to female students (60%), and the lowest average ranked willingness to take risks (both 10% for females and males), female students although having the same average ranking achieve higher percentages. The only characteristics and behaviours where there is a difference are for openness to ideas with an average ranking of 5 for female students (37.5%) and 7 for male students (22.5%) and willingness to take risks, average ranking of 9 for both female and male students (10% for both). What these average figures show is that female students perform better for the average percentages based upon the indicators of characteristics and behaviours that contribute to innovative work based learning, except for leadership and management skills, which overall is contrary to the findings of the early work in this area (Belenky et al., 1986; Taylor and Burgess, 1995; Brennan and Little, 1996) and in line with recent findings (Lifelong Learning UK, 2010; LSIS, 2012) and indicative of the better performance of female students over their male counterparts in education in recent years.

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