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International Journal of Psychology and Educational Studies

Influence Factor of Tertiary Students' Employability Awareness Adjust Industry 4.0

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ARTICLE INFO

ABSTRACT

This study aims to analyze the correlation (N=621) among tertiary students' career planning, e-recruiting adoption acceptance, and employability awareness in Taiwan. Tertiary students' perceived career planning includes four factors, namely, self-appraisal, job expectancy, goal selection, and problem solving. E-recruiting adoption acceptance includes four factors, namely, playfulness, ease of use, effectiveness, and usefulness. Employability awareness includes four factors, namely, personal adaptability, employability ambition, career identity, and labour market. Participants responded to a 5-point Likert-type scale for each factor. Analysis was conducted using the structural equation modeling (SEM), and a good model fit was found for both the measurement and structural models. Research findings demonstrate that tertiary students' career planning significantly and directly influences employability awareness. Career planning significantly and indirectly influences employability awareness by e-recruiting adoption acceptance. Tertiary students' career planning and e-recruiting adoption acceptance fit the influence model and empirical data of employability awareness. Implications of this study, including the value of student self-assessment of their skills and utility of the e-recruiting to underpin personal career development planning and inform graduate recruitment processes, are discussed and recommendations made.

1.Introduction

Graduate employability is a key issue for Higher Education. While offering career planning services to both employers and students to facilitate the matching of talents to the demands of the job market, tertiary education major role is to provide career education — to facilitate students' understanding of self and their motivation in setting clear career goals; to offer guidance for making sound career choices and decisions; and to help them acquire job-hunting skills and implement relevant and effective job-hunting strategies (Gerards, Grip, and Witlox, 2014; Hinchliffe and Jolly, 2010; Paadi, 2014).

The e-recruiting websites are platforms for information on job opportunities and requirements (Vicknair, Elkersh, Yancey, and Budden, 2010). Industry manpower supply and demand information through the Web-based recruitment can help students to understand job demand and change. Enterprises are using e-recruiting websites to recruit employees. On the other hand, the practice of using corporate websites to recruit new employees has new career counsel and job search teaching media for promoting students' employment awareness. E-recruiting websites have changed enterprises' recruiting methods and job seekers' job seeking methods (Adrews and Russell, 2012; Braddy, Meade, Michael, and Fleenor, 2009; Shafie, 2010). In addition, they also have become the most frequently used platform and interface for job seekers and job

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recruiters (Maurer and Liu, 2007; Misra and Mishra, 2011; Tominson, 2012).

E-recruiting adoption acceptance show employee accepted information about company profiles, job vacancies, and employment requirements. Students through employment requirements include the requirements concerning formal education, experiences, past performances, and the physical traits of the potential candidates, as well as the occupational skills, personal characteristics, and personal traits for the corresponding posts, which can help students understand the job competences (Maurer& Cook, 2011; Paadi, 2014; Saunders and Zuzel, 2010).

From a social cognition theory point of view, high career planning of students has actually indicates towards high career identity, personal adaptability, employability ambition, and labour market (Fugate, Kinicki, and Ashforth, 2004; Gaudron, 2011). Research suggests that e-recruiting adoption acceptance is important to affect employability awareness. It is positively related to students' career identity, personal adaptability, employability ambition, and labour market. It is suggested that the concept of e-recruiting adoption acceptance, derived from social cognition theory plays an important role in the development of employability awareness (Huang, 2013; Wang, 2013).

The paper, Analysis of factors in tertiary students perceived career planning and employability awareness: using e-recruiting adoption acceptance as a mediator variable, discussed the variables which may influence tertiary students employability awareness and found the relationships among the variables.

1.1 Purposes of this study

The purposes of this study are to address the 2 following issues.

1. What are the relationships between tertiary students' perceived career planning, e-recruiting adoption acceptance, and employability awareness?

2. Can we identify a suitable model that relates these factors and helps to identify important implications for using e-recruiting to improve students' employability awareness?

2. Methodology

2.1 Research design

This study employed a structural equation modeling (SEM) to analyze the relationships between tertiary students' perceived career planning, e-recruiting adoption, and employability awareness. Data were collected through a survey questionnaire, which is comprised of questions on demographics and multiple items for each construct in the study. Normal distribution testing of the related variables in the model of this study is shown in Table 1. Although all observation variables do not reach normal distribution ($p<.05$), multi-variance normal test is insignificant ($p>.05$), which demonstrates normal distribution. According to the conditions of Maximum Likelihood (ML), within the most commonly used approach in SEM one of the conditions should be a simple random sampling that meets multi-variance normal distribution. Samples of this study meet the conditions of ML. Some scholars suggest that it is influential only when Kurtosis is above 25; therefore, when Kurtosis is below 25, ML is still an applicable analysis (Bagozzi &Yi, 1988; Bentler and Bonett, 1980; Hair, 2010). Boomsma and Hoogland (2001) compared and probed into the completeness of different estimation methods, and concluded that in regard to models with observation variables above 6 or 8. With non-normal distribution, ML has better statistical traits. Thus, although overall variables of this study meet the multi-variance normal distribution of ML, a single variable does not meet normal distribution. Kurtosis of multi-variance distribution is not large (<25); therefore, this research estimates the model by ML.

2.2 Participants

This study treated tertiary students as the population, and adopted random sampling and cluster sampling for a survey. A total of 621 valid samples were collected. In this population, Table 1 shows respondents' gender, age, current post, school category, student background, and school attributes. Participants gave informed consent before the study commenced.

Table 1. Distribution of tertiary students' background in survey (N=621).

Participant demographics	Frequency	%
Gender		
Male	322	51.9
Female	299	48.1
Age		
20 years (and below)	141	22.7
21-22 years	229	36.9
23-24 years	215	34.6
Over 25 years	36	5.8
Current post		
Full-time students	327	52.66
part-time teachers	294	47.34
Student background		
Science, engineering, agriculture and design	207	33.33
Business, management, tourism and recreation	211	33.98
Health and medical care	137	22.06
Liberal arts, law, education and general knowledge	66	10.63
School attributes		
Public	314	50.6
Private	307	49.4

2.3 Measures

A 42-item survey questionnaire was developed to measure participants' career planning, e-recruiting adoption, and employability awareness. The scale for career planning included four constructs, namely, self-appraisal (3 items), occupation information (3 items), goal selection (3 items), and problem solving(4 items). The scale for e-recruiting adoption acceptance included playfulness (3 items), ease of use (3 items), effectiveness (3 items), and usefulness (3 items). The scale for employability awareness included labour market (4 items), career identity (4 items), employability ambition (5 items), and personal adaptability (4 items). The items reflected in the questionnaire could allow participants to take reference from their personal experiences when responding. Each item was measured on a five-point Likert scale of 1=strongly disagree to 5=strongly agree. A total of 13 items were used to measure career planning, 12 items were used to measure e-recruiting adoption acceptance, and 17 items measure employability awareness. These items are listed in the table 1.

2.4 Research tool

The research tool was the survey of "Investigation of factors in tertiary students' employability awareness". The compilation of this scale was based on the concepts of the e-recruiting adoption acceptance subscale by Cho, Lee and Liu (2011), and Lee (2007), career planning subscale by Gaudron (2011), and Rothwell, Herbert and Rothwell (2008), and the employability awareness subscale by Rothwell, Jewell and Hardie (2009),

Saunders and Zuzel (2010). In this study, three experts evaluated the fitness of the questions in order to verify the expert fitness of the scale. Eight tertiary students were invited to answer the questionnaire in order to enhance face validity. Six tertiary schools were selected for a pre-test, with 115 students as the subjects. A total of 123 valid samples were collected; with a valid return rate of 95%. The scale in this study was a self-reported inventory, based on a Likert 5-point scale, where the range of "agree" to "disagree" is denoted by 5 to 1, respectively. The factor names, number of items, validity, and reliability levels of each aspect in this scale are as shown in Table 2.

Table 2. Factors, number of items, validity and reliability of tertiary students' perceived career planning and e-recruiting adoption acceptance on scale for tertiary students' employability awareness.

Factor	Composition of scales	No of items	Factor loading	Cronbach α	Accumulated explained variance	Kmo	Total reliability Cronbach α
Scale of career planning	Self-appraisal	3	20.54	.91			
	Occupation information	3	18.13	.88	64.95	.913	.92
	Goal selection	3	16.17	.85			
	Problem solving	4	10.11	.91			
E-recruiting adoption acceptance	Playfulness	3	23.54	.88			
	Ease of use	3	19.24	.91	64.80	.864	.90
	Effectiveness	3	12.41	.91			
	Usefulness	3	9.61	.90			
Employability awareness	Labour market	4	20.78	.91			
	Career identity	4	19.24	.89	62.49	.842	.91
	Employability ambition	5	12.14	.88			
	Personal adaptability	4	10.33	.86			

2.5 Data analysis

Regarding data processing of formal survey, the returned questionnaires were coded. Linear Structural Relations (LISREL) was used to validate the correlation and influences among career planning, e-recruiting adoption acceptance, and employability awareness by Statistical Package for Social Science, SPSS 10.0. Statistical test criterion of this study is α=0.05.

3. Results

3.1. Fit test of influence model of employability awareness materials

This study validated the model by LISREL 8.52. The estimation method was determined after examining the samples, and model estimation was carried out by software. Before the model fit test, whether the estimation coefficient is over the defined scope was verified. Only when parameter coefficients estimated do not violate the estimation can the fit test be conducted.

According to the definitions of Hair, Anderson, Tatham, and Black (1998), the three following items can be used to examine estimation violations: 1) negative error variable exists; 2) normalized coefficient is above or approximate to 1 (0.95 is the usual threshold), and 3) significant standard deviation. According to parameters estimations reveal positive error variables, and there are no negative variables. Normalized

coefficient is 0.25~0.95, and the remaining within the scope. Therefore, parameters estimations are not violated, and fit could be conducted.

This study conducted model fit testing by general criterion, according to fit measures estimated by the statistical method, in order to find out the fitness between the research data and model. Measures of this study are based on absolute fit, incremental fit, and parsimonious fit, as classified by Hair, Anderson, Tatham, and Black (1998). In addition, construct reliability and validity tests of variables were used to determine the internal structural fit. Analytical results are shown below.

3.2. Overall fit

Based on the above, overall fit can be measured by absolute fit, incremental fit, and parsimonious fit. After estimation by LISERL 8.52, according to Table 3 the chi-square of the model is = 212.14, p<.05, which is significant, and shows that there are significant differences between the covariance matrix of the model and the empirical data. Chi-square testing can be easily influenced by the number of samples and normality of the data. Therefore, when evaluating overall model fit, this study includes other measures.

This study first examines theoretical validation of the model regarding unsatisfying evaluation standards. After reviewing MI, the model is modified according to the rationality of the theory. Although model fit after modification is enhanced, estimates of Usefulness and e-recruiting adoption acceptance do not reach a level of significance, and re-estimation is required. Although modified χ testing fails to reach a statistical significance level, the model fit is improved and mostly satisfies the standards. In addition, tests of overall fit are generally positive.

According to the analytical results of the revised model in Table 3, in absolute fit measures, GFI= 0.91, which is slightly higher than the standard of 0.9. According to Gefen and Straub (2000), GFI should be above 0.90, thus, this model is acceptable. AGFI= 0.83, which is higher than the standard of 0.8. Gefen and and Straub (2000) suggests that AGFI should be above 0.80 thus, thus, the model is acceptable. RMSEA= .012 and <0.08. According to Jarvenpaa, Tractinsky and Vitale, (2000), RMSEA should be lower than 0.08, thus, based on the measures above; absolute fit of this model is good.

Table 3. Results of overall model fit test of tertiary students' employability awareness.

Model fit	Evaluation items and outcome (N=831)	Evaluation standard	Scholars	Fit
	χ2= 212.14	<5	Hair et al. (1998)	Acceptable
	d .f.= 45			
Absolute fit	χ2/ d .f.=4.75			
	GFI= 0.91	>0.9	Hair (2010)	Acceptable
	AGFI= 0.83	>0.8	Hair (2010)	Acceptable
	SRMR=0.09	<0.1	Hu and Bentler (1999)	Acceptable
	RMSEA= .012	<0.08	Jarvenpaa et al. (2000)	Acceptable
Incremental fit	NFI= 0.92	>0.9	Bentler and Bonett (1980)	Acceptable
	NNFI=0.91	>0.9	Bentler and Bonett (1980)	Acceptable
	IFI= 0.92	>0.9	Bentler and Bonett (1980)	Acceptable
	CFI= 0.91	>0.9	Bagozzi&Yi (1988)	Acceptable
Parsimonious fit	PNFI= 0.68	>0.5	Bentler and Bonett (1980)	Acceptable
	PGFI= 0.57	>0.5	Bentler and Bonett (1980)	Acceptable

As to incremental fit and parsimonious fit measures, according to Gefen and and Straub (2000) and Hair et al. (1998), when NFI, IFI, RFI, and CFI are above 0.9, PNFI and PGFI should be above 0.5 in order for the

model to be accepted. According to data tested, NFI= 0.92, which is above the standard 0.9. It shows that the model is accepted. IFI= 0.92, which is above 0.9 means that the model is accepted. RFI= 0.89, which is lower than the standard 0.9. It means that the model is almost acceptable. CFI= 0.91, thus, the model is relatively acceptable. PNFI= 0.68, which is above the standard 0.5 means that the model is relatively acceptable. PGFI= 0.57, which is above 0.5 means that the model is acceptable. According to the incremental and parsimonious fit measures above, the models of this study are acceptable. However, absolute fit is good, which suggests that the models are still acceptable, as the overall model meets empirical data.

3.3. Structural fit

Regarding structural model fit, Hair Jr. et al (1998) suggested the measurement significance test and the R2 of latent dependent variables of structural parameters. The R2 of dependent variables should be lower than the standard of 0.5, and correlation among the latent variables should be higher than 0.90.

Regarding the structural fit test, according to the structural parameters of the influence model of tertiary students' employability awareness materials, career planning and e-recruiting adoption acceptance are significant (t=4.52, p<.05). In addition, as to the evaluation of R2 latent dependent variables, , career planning, and e-recruiting adoption acceptance are 0.48 and 0.62, respectively. The R2 of e-recruiting adoption acceptance is lower than 0.50, which meet the evaluation standards; therefore, the structural model fit of this study is good.

Correlation coefficients of the latent variables are further tested. The coefficients of the three latent variables are 0.48~0.84. The correlation coefficient of employability awareness on career planning is higher than 0.60. Thus, the three latent variables may affect the structural model fit due to overly high correlations.
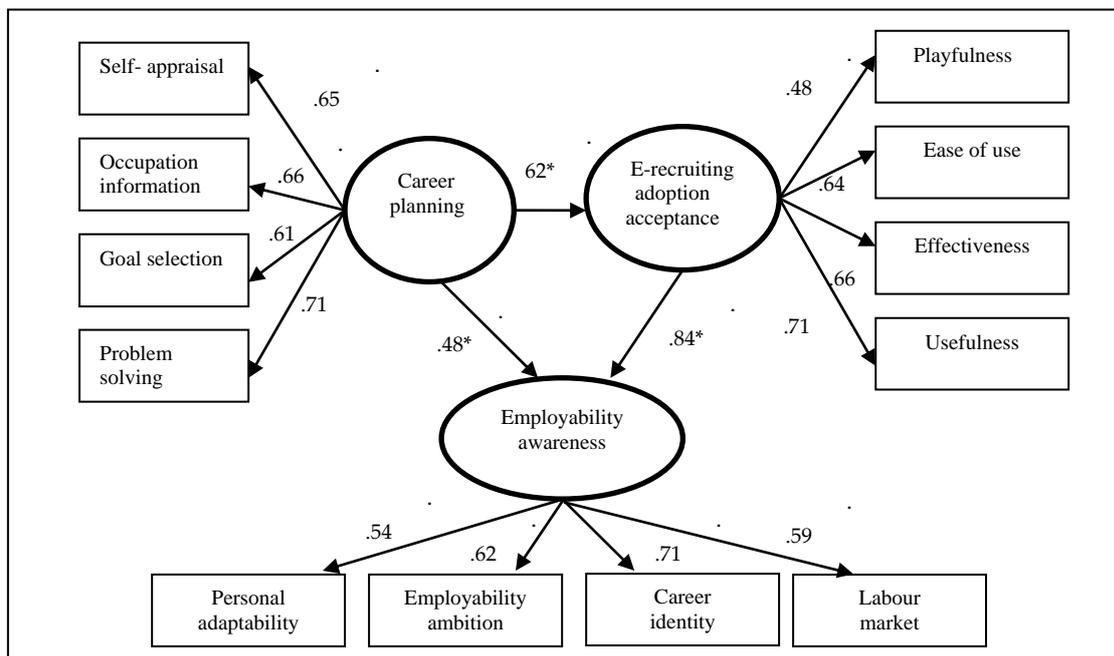

Figure 1. Path of tertiary students' employability awareness.

4. Discussion

This study aims to analyze the correlations among tertiary students' perceived career planning, e-recruiting adoption acceptance, and employability awareness in Taiwan. The findings are as shown below:

Tertiary students' career planning, goal selection, and problem solving show significant influence on employability ambition and career identity in student's employability awareness. Occupation information and labour market allow students to recognize objectives of employability awareness in schools. When students encounter job environmental changes and employ competition, teachers gradually understand and trust the measures of the students' career planning. Through goal selection and rewards by students, teachers can fulfill their creativity and further employability courses and e-recruiting technology adoption teaching design. This will allow them to accomplish student employability objectives and career identity in order to meet industry environmental changes (Dinther, Dochy, Segers, and Braeken, 2014; Grobler, Joubert, and Lesuthu, 2014; Kasperzack, Ernst, and Pinquart, 2014).

Tertiary students' career planning, staff commitment, and problem solving show significant influence on ease of use and effectiveness of e-recruiting adoption acceptance. Career identity and employability ambition in tertiary students' employability awareness significantly influence effectiveness and ease of use of e-recruiting adoption acceptance. Tertiary students' perceived problem solving and self-appraisal will enhance tertiary students' effectiveness of labour market, employability ambition, and implementation of e-recruiting technology. It is one of the key factors on tertiary students' e-recruiting adoption acceptance (Cho, Lee, and Liu, 2011; Gerards, Grip, and Witlox, 2014; Grobler, Joubert, and Lesuthu, 2014).

Tertiary students' career planning significantly and directly influences employability awareness. Career planning significantly and indirectly influences employability awareness through e-recruiting adoption acceptance. Tertiary students' career planning and e-recruiting adoption acceptance fit influence model and empirical data of employability awareness. Therefore, teachers should respect and support students' career decision problem solving through cognition employability of and evaluation e-recruiting contents, teachers can constantly ponder on e-recruiting teaching and information technology. They will enhance career identity and employability ambition. Tertiary teachers' active promotion of web-based recruiting technology ideas in employability and practical use of e-instruction will encourage student learning. They identify with goal selection through career planning in order to develop tertiary students' employability awareness, and constantly adopt and implement e-recruiting technology. Thus, they will result in useful e-recruiting and employability ambition (Grobler, Joubert, and Lesuthu, 2014; Hinchliffe, and Jolly, 2010; Huang, 2013;; Paadi, 2014).

Although the model of this study reveals goodness of fit, the fit effect remains unsatisfying, which suggest that there are some latent variables that have not been elaborated. Variables in models sometimes fail to reveal the ideal explanatory effect; thus, this study further probes into the model with a more complete overall fit.

4.1 Limitations of the study

This study focuses on the influence of tertiary students' perceived career planning on employability awareness. Kasperzack, Ernst and Pinquart (2014) found that students' career resilience has a significant direct effect on employability self-efficacy, and perceived labor market competition has a significant effect on employability self-efficacy through employability self-efficacy. When students perceived employability awareness and labor market competition tend to identify more closely with the career planning. Students use the e-recruiting network system and are engaged in activities of job search and employment processing. Would such activities cause them to highly identify with employability awareness? This is a limitation of this study.

4.2 Implications for practice

The findings of this study demonstrate that "goal selection" and "problem solving" of tertiary students' "career planning" significantly influence "employability awareness". E-recruiting technology users' use

intentions depend on their attitudes toward e-recruiting adoption acceptance. Job search resources and teacher support employability information will indirectly affect users' intentions to use e-recruiting systems (Tong, 2009; Woods, and O'Leary, 2006). Administrators of tertiary should create tertiary students' career planning that encourage students to continually contemplate on goal selection approaches, and through problem solving and goal selection, energize tertiary students' active promotions of personal adaptability for e-recruiting technology adoption and continuous employability learning.

Acknowledgements

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