Validity and Reliability of the Human Resource Competencies Scale

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Abstract: The purpose of this paper is to adapt and analyze the validity and reliability of the HR Competencies Scale among HR professionals in the Malaysian context. A questionnaire survey was carried out to acquire data from 154 HR professionals. The exploratory factor analysis (EFA) showed a three-factor structure: Knowledge of Business, HR Functional Expertise and Managing Change. The instrument generates a high degree of confidence in the scale's validity and reliability. This paper fulfils an identified need for the development of an empirically validated instrument to measure HR Competencies. This reliable and validated instrument enables and facilitates future studies in the HR competencies research stream.

Key words: HR Competencies Scale · Validity · Reliability · Factor analysis · Correlation

INTRODUCTION

The term competency has been defined in the literature from several different points of view. McClelland [1] was the first to introduce the term "Competence" into the human resources literature. Competences represent knowledge, skills, traits, attitudes, self-concepts, values or motives directly related to job performance or important life outcomes and have shown to differentiate between superior and average performers [1]. Boyatzis [2] defined competency as an underlying characteristic of a person, resulting in superior performance in a job. Spencer and Spencer [3] defined competencies as "the combination of underlying attributes, skills, traits, knowledge and motives of a person which have been causally related to superior performance in a job" (p. 9).

Several efforts have been made recently to identify the critical competencies needed to be a successful HR practitioner. Long [4] and Long and Wan Khairuzzaman [5] examined HR competencies and their relationship to the success factors among 32 HR professionals from Malaysian manufacturing companies situated in Johor. The HR Competency Survey model (strategic contribution, personal credibility, HR delivery, business knowledge and HR technology) by Brockbank and Ulrich [6] is used in his study. Both of his studies found that competencies such as strategic contribution, business knowledge and HR technology have significant

correlation with firm performance. However, no correlation was found between personal credibility and HR delivery in assessing a firm's performance.

Han, Chou, Chao and Wright [7] explored the relationship between HR competencies and HR effectiveness. Respondents included 182 high-level executives, 152 HR managers, 320 line managers and 1,262 employees within 39 surveyed Taiwanese high-tech firms. They measured HR competencies from the HR professional competency items developed by Ulrich, Brockbank, Yeung and Lake [8]. They found that in the Taiwanese high-tech context, HR competencies of field expertise and change management are strongly related to HR effectiveness as perceived by line managers and employees, while business knowledge is not.

Selmer and Chiu's [9] study aimed to provide updated views on the competency needed for future HR leaders in Hong Kong. The HR competency questionnaire was self developed. Based on principal components factor analysis with varimax rotation, eight factors were extracted: human resource knowledge, professional personal skills, strategic labour relations, change agent, innovation and crisis management, financial/business knowledge, organizational knowledge and corporate relations.

Ulrich *et al.* [8] longitudinal study, which started in 1998, with data from 12,689 HR professionals in 109 organizations, represented an extensive assessment of

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HR competencies. The overall result of the study showed critical HR professional competencies in those domains as 18.8% for business knowledge, 23.3% for functional HR expertise and 41.2% for management of change.

HR competencies described by Ulrich was chosen in this project because it is the most widely cited study of HR competencies as highlighted by McEvoy, Hayton, Warnick, Mumford, Hanks and Blahna [10]. The dimensions used were *Knowledge of Business, HR Functional Expertise and Managing Change.* Although Ulrich *et al.* [8] HR Competencies Scale has been investigated in three dimensions in the literature [7, 8], it has not been closely examined in terms of their validity and reliability.

Objective of the Study: The purpose of the current study was to examine the psychometric properties of the HR Competencies Scale developed by Ulrich *et al.* [8].

MATERIALS AND METHODS

Research Site and Subjects: The study took place in various HRM professional courses, programs and seminar organized by Malaysian Institute of Human Resource Management (MIHRM). The research idea and project were proposed to the President of the Institute and he agreed to allow the participants (who are the members of the Institute) to participate. Their participation was voluntary. Initially, 163 participants completed the questionnaires, but nine of the questionnaires were discarded from further analysis due to many unanswered questions.

Procedure: The questionnaire was administered to the participants during the courses, programs and seminar. Almost all of the potential participants who were approached by the primary researcher in the context of this courses, programs and seminar agreed to take part in the study. At the beginning of the courses, programs and seminar, it was clearly stated to the participants that all the information contained in their questionnaires would remain confidential. Instructions on how to correctly answer the questions were given to them. Participants were asked to return the completed questionnaire at the end of the courses, programs and seminar. A token of appreciation was given to the responding participants as incentives. The basic information of the participants (gender, age, race, position, etc) was coded to ensure absolute confidentiality and a better handling of the information. Respondents were told that they would be provided with the results of the study at their request.

Profile of the Respondents: After correcting the questionnaires and eliminating questionnaires with incomplete or wrong answers, the final sample included 154 participants. Of the 154 participants, 47 (37.5%) were male and 107 (69.5%) were female. Mean age of the sample was 34.6 years. The average number of working experience in HR with the current organization is 7.1 years. More than half of the respondents (63.0 per cent) were Malays, followed by Chinese (26.6 per cent), Indians (7.8 per cent) and others (2.6 per cent). About 64.3 per cent of the respondents were married. More than half of the respondents (69.5 per cent) were female. Further, 52.3 per cent of the HR professionals had a bachelor degree, 14.9 per cent had Master degree, 23.4 per cent had either diploma or STPM, 5.4 per cent of the HR professionals had SPM, 1.3 per cent of the HR professionals had a PhD and 1.9 per cent had only certificate from management/HR professional bodies. About 37.7 per cent of the participants were in business and management field of study and 24.7 per cent were in HR/industrial relations fields. For their current position in the organization, 41.6 per cent were HR officers/senior HR officers, 23.4 per cent were HR managers and 7.8 per cent were HR executives/senior HR executives.

Instrument: HR Competencies Scale has 33 items: its items are adapted from Urich *et al.* [8] study. Three dimensions were adapted reflecting knowledge of business (e.g., The HR professionals in our company are knowledgeable about our company's business model); HR functional expertise (e.g., The HR professionals in our company are effective in recruiting, promoting and placing appropriate people who fit the job description and requirements); and managing change (e.g., The HR professionals in our company can use up-to-date methods and technologies to accomplish my functional goals (e.g., online recruiting, e-learning). Items were rated on a 7-point scale: (7) strongly disagree, (6) agree, (5) slightly agree, (4) neutral, (3) slightly disagree, (2) disagree and (1) strongly disagree.

Validity of the HR Competencies Scale
Content Validity: Content validity (also known as logical validity) refers to the extent to which a measure represents all facets of a given social construct [11]. Besides, content validity indicates that the items included in the survey correctly represent the concept to be analyzed [12] and is evaluated based on logic and theory [13] rather than statistical testing. In this study, the HR Competencies Scale was taken from existing literatures, which give this study adequate content validity.

Construct Validity (Factor Analysis): Construct validity refers to whether a scale measures or correlates with a theorized psychological construct [14]. The exploratory factor analysis with Varimax rotation was used to assess the construct validity of the research instrument. Exploratory principal factor analysis also provides "*ad hoc*" evidence of convergent and discriminate validity [15].

Exploratory factor analysis (EFA) was performed to identify and confirm the underlying structure of the items and to further reduce their number. To examine HR competencies scale, the principal component analysis with varimax rotation was performed to the 33-item scale. Initially, the suitability of the data for factor analysis was explored. The first round of factor analysis, The KMO measure of sampling adequacy was found to be 0.953, which is higher than the minimum acceptable value of 0.6, indicating that the sample size is large enough to factor analyze the 33 variables. Besides, the Chi-square value of Bartlett's Test of Sphericity, which shows the suitability of the intercorrrelation matrix of the 33 variables for factor analysis, was significant at the 0.00 level. Therefore, the sample size and the nature of the data both fit for the analysis.

Looking at the communalities table, item KB4 was deleted because the value was smaller than 0.4. Item communalities of .80 or greater are considered high [16], but magnitudes of .40 to .70 are common in the social sciences [17]; thus, communalities less than .40 were flagged for further investigation. The factor analysis was re-run until a satisfactory result was achieved.

In the second round, item FE4 was deleted because this item loaded equally heavily into more than one factor. Therefore, this item was deleted in the EFA. The process of scale purification in this initial stage reduced the number of items from 33 to 31 items. In the final round, the results showed that the KMO was 0.954, which is greater than 0.6 and indicate an adequate sample. The Bartlett's test of sphericity for the 31-item correlation matrix was highly significant (chi-square = 5995.42, df = 465, p < 0.000). The results indicate sampling adequacy and that the factor model is appropriate.

As shown in Table 1, among these 31 items, the factor analysis extracted three factors which explained 77.33% of variance with item loadings exceeding 0.5. The percentages of variance explained for each factor are 66.03%, 6.91% and 4.38%, respectively. The eigenvalues of the first three factors were 20.47, 2.14 and 1.36, respectively. Three factors or domains were retained. Also, the scree plot suggested that three factors should be retained.

Table 1: Explained variances, factor loadings and item total correlations for three subfactors of the HR competencies scale

Items	Factor loadings after rotation		
	F1	F2	F3
FE14	.738		.423
FE9	.732		.432
FE1	.709	.459	
FE6	.709		.398
FE11	.699		.377
FE13	.697		.438
FE12	.691	.352	.411
FE7	.690		.473
FE16	.681		.507
FE2	.681	.536	
FE10	.675	.349	.408
FE17	.674	.451	.407
FE15	.665		.512
FE8	.657	.361	.437
FE3	.650	.525	
FE5	.599	.471	.365
KB9	.303	.820	
KB2		.797	
KB1	.383	.771	
KB7		.771	.334
KB5		.762	.340
KB6		.759	.387
KB3	.317	.747	
KB8		.742	.334
MC5	.358	.336	.803
MC6	.424	.322	.752
MC3	.347	.442	.752
MC4	.378		.745
MC2	.335	.449	.717
MC7	.433	.383	.678
MC1	.352	.502	.640
Eigenvalues	20.470	2.140	1.360
Explained variance (%)	66.030	6.910	4.380

Note: Boldface indicates which items are best explained by a given factor. F1 = Functional Expertise; F2 = Knowledge of Business and F3 = Managing Change

In the light of the rotated component matrix, 16 items were allocated to the first factor, functional expertise. The second factor, with 8 items, was named knowledge of business. The last factor included 7 items and was named managing change. It was proved in this study that the HR Competencies Scale is valid (in terms of construct validity), acceptable and suitable tool to be used in HR competencies research in this country.

Table 2: Correlation Matrix

		Mean	Standard Deviation	1	2	3
1	Functional Expertise	4.904	1.034	.98		
2	Knowledge of Business	5.060	1.045	.762**	.96	
3	Managing Change	4.960	1.110	.843**	.740**	.96

** Significant at the 0.01 level

* Significant at the 0.05 level

Note: Values in bold are Cronbach alpha values

Convergent Validity: Further to the construct validity test using the factor analysis (between scales) another factor analysis but this time using the within scale was utilized to test the convergent validity. According to Campbell and Fiske [18], convergent validity refers to all items measuring a construct actually loading on a single construct. Convergent validity is established when items all fall into 1 factor as theorized. Convergent validity was carried out through a within factor, factor analysis in order to obtain a more in-depth judgment of the dimensionality of the construct under study [19]. All the three factors displayed uni dimensionality with Functional Expertise, KMO was 0.941 explaining 73 percent of the variation, Knowledge of Business, KMO was 0.912 explaining 77 percent of the variation; and Managing Change with KMO of 0.94 and explained 83 percent of the variation. Thus, the analysis provides support for convergent validity.

Discriminant Validity: Discriminant validity refers to the independence of variables [20]. Discriminant validity also refers to the assumption that observed constructs should not be highly correlated to each other (multicollinearity). In other words, observed variables should be discriminating or distinct [18]. It is assessed by showing that the correlations among variables are significantly different from 1.0 [21]. In summary, all factor intercorrelations were significantly different from 1.0 at the 0.05 significance level (Table 2).

Reliability of the HR Competencies Scale
Reliability (Internal Consistency): The resulting factors were subjected to reliability analysis. The reliability of the instrument is assessed by evaluating internal consistency. Internal consistency examines the degree to which the items used to assess a construct reflect a true, common score for the construct [22]. To assess internal consistency in this research, Cronbach's alpha measure is used.

The reliability coefficient was 0.98 for Functional Expertise, 0.96 for Knowledge of Business and 0.96 for Managing Change. Hence, it can be concluded that these measures posses sufficient reliability.

DISCUSSION

This study is one aspect of a larger study of the effect of HR competencies on organizational outcomes. The HR Competencies Scale was developed by Ulrich *et al.* [8]. The purpose of this study was to examine the factor structure and psychometric characteristics of the HR Competencies Scalein Malaysian context. Three factors were extracted: Functional Expertise (16 items), Knowledge of Business (8 items) and Managing Change (7 items). We concluded that the scale is a reliable and valid instrument for use in Malaysia. We had the opportunity to establish the psychometric properties of the HR Competencies Scale in a moderately sized sample. A larger, more diverse and balanced sample would have been desirable.

Initiating a common practice of frequent testing of an instrument's psychometric properties establishes reliability and validity of instruments, making them more valuable to researchers. This is especially true for the social science research. This, in turn, serves as good practice for new and upcoming researchers and is beneficial to the research community. As reliability and validity may vary from one group of participants to another, it is beneficial for researchers to take the time and effort to establish psychometric properties for their instruments on specific populations.

Researchers should neither accept non-replicated reports without verifying results nor generalize results, especially when using generic instruments with specific populations. Instead, researchers should use findings from studies using adequately tested, reliable and valid HR Competencies measures to help them in their decision making. Reporting psychometric properties of instruments is more convincing for researchers who may want to replicate studies or who need this information when faces with deciding which instruments to use when planning a new study. Accruing additional evidence of reliability and validity should be a common practice among researchers and should be done in all future studies.

Some limitations should be noted. To establish evidence of statistical generalizability, we need to repeat the study with new samples from the population

(e.g., CEO, directors, line managers). With just one study, we can only address statistical generalizability by not drawing any conclusions beyond the scope of our sample. In addition, this instrument is not validated in a logical model of antecedents and outcomes. Future studies need to examine the validity of this instrument in a nomological model. The most obvious extension is to investigate the interrelationships between HR competencies and other management or human resource management (HRM) constructs, i.e. the adoption of electronic HRM, HRM performance and competitive advantage. The HRM literature has made great strides in understanding HR competencies with performance and competitive advantage. Given the interest in investigating HR competencies could be extended to analyze HR competencies from multiple constituents, i.e, top level managers, middle managers, employees and line managers in different settings will come out with new and useful findings.

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