RELIABILITY TESTING OF A NEW SCALE FOR MEASURING ATTITUDES TOWARDS LIFELONG LEARNING AND HUMAN RESOURCE DEVELOPMENT, (LLEHUREDE) SCALE

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Abstract

The aim of present study was to investigate the reliability of the questionnaire LLEHUREDE that measures attitudes towards lifelong learning and its impact on human resource development by checking it through the usage of five models, which are: 1. Model Alfa (Cronbach's α), 2. Model Spit-Half, 3. Model Guttman, 4. Model Parallel and 5. Model Strict Parallel. The sample group of this research study consisted of 87 employees and employers who work at the same place in Greece. Indeed, these five different methods of reliability asserted the reliability of the 80 items' scale.

Keywords: Reliability testing, lifelong learning, human resource development, LLEHUREDE Scale

INTRODUCTION

Today, more than ever before, the challenge to manage people is extremely commanding due to the rapid changes like technological, societal, civic and economic changes.   The continuous increasing workforce mobility and the struggle of employers, not only to get well-qualified employees but mainly to keep their employees, put an emphasis on training and development of the workforce. Gaining competitive advantage, and to more extent sustainable advantage, seems to be an illusion without investments in training and development of staff. People in the Human Capital Management (HCM) strategy are considered to be the determinant of adding value to the organization (Baron & Armstrong, 2007) through their learning and development. Also, the value of human resources is of great interest when enterprises and organizations are about to compete in the global marketplace where global strategic plans are required to be implemented (Briscoe, Schuler & Claus, 2009).

Current shift from training to learning highlights the importance of more flexible kinds of learning like, informal, non-formal learning, active learning, transformative learning and social learning. Concerning the time and energy spent on learning as well as the value added, lifelong learning seems to overarch every kind of learning. Inevitably, human resource development is regarded as the most valuable priority of each enterprise and organization in gaining competitive advantage and enhancing personal and organizational performance. Therefore, the investigation of understanding and measuring the influence of lifelong learning on human resource development is of strategic importance.

THEORETICAL FRAMEWORK

Estimating people as the most valuable resource, the importance of their training, development and learning reflect to human resource management (HRM), strategic human resource management (SHRM) and their link to human capital theory, human capital management (HCM) and resource based view (RBV) strategy. Donkin (2005) emphasized human capital management (HRM) by stating that "good human capital management is all about learning, understanding, intervening and adjusting" (Donkin, 2005, as cited in Baron & Armstrong, 2007, p.2). Ehrenberg and Smith (1997), in their human capital theory, consider that employees offer their knowledge and set of skills, gained from education, training and experience, to their employers and as a result, they essentially assign the success of an enterprise or organization (Ehrenberg & Smith 1997, as cited in Baron & Armstrong, 2007, p.2).

But under what circumstances human resource can be the vital resource of sustainable competitive advantage? Answer to that question was given by Wright et al. (1994) and his investigation in terms of human resources. According to his point of view, the definition of human resources included knowledge, skills and abilities (KSA) as well as behaviour based on resource based view RBV (Wright et al, 1994, as cited in Kokkonis & Mihiotis, 2009, p.62).

The construct of knowledge, skills, and abilities (KSA), which is dealt with job or task performance and its assessment, has been expanded to the concept of competency, which includes qualities like motives, traits, self-concept and values (Clardy, 2008, p. 388). Moreover, the developing concept of core competences seems to attract the interest of many researchers and hence, this can be traced back to the resource based view strategy. Core competences are the collective learning in organizations, whereas the organizational learning, strategic flexibility, effective technology management and people management consider being the main sources of core competencies (Bani-Hani, & AlHawary, 2009, p. 98). Core competences and competitive advantage are founded through the issue of capabilities, which can be any functional system including marketing, organizational learning and human resource management (Clardy, 2007). Another approach of understanding core competences derives from the resource-based theory.

Building sustainable competitive advantage relies on the internal resources and capabilities of an organization and this is the main specification of Barney (1991). He argued that resources in order to provide sustainable competitive advantage should be rare, valuable, inimitable, and non substitutable (Barney, 1991, as cited in Schuler & Jackson, 2007, p.77). Since Barney outlined these basic criteria for resources, in that way he supported the popularity of resource based view (RBV) within strategic human resource management (SHRM). Therefore, as human resources are more valuable than any other kind of resources, it is apparent that its development constitutes the first priority of each enterprise and organization. Additionally, as the aspect of lifelong learning takes the centre of human resource strategy, it is essential to understand and measure the influence of lifelong learning on human resource development by creating a tool of connecting the two issues.

THE RESEARCH INSTRUMENT

The instrument, which intended to measure employees' attitudes towards lifelong learning in relation with human resource development, was named LLEHUREDE Scale (Table A). This tool consisted of 80 items referring to the eight different attitude subscales as it was resulted after the application of Principal Component Analysis (Anastasiadou, 2008; Anastasiadou, 2009; Anastasiadou & Papa, 2009; Anastasiadou & Loukas, 2009; Anastasiadou, et al., 2010a; Anastasiadou, et al., 2010b; Anastasiadou & Anastasiadis, 2011a; Anastasiadou, 2011b; Anastasiadou & Karakos, 2011c) and these subscales are the following:

(a) Awareness of lifelong learning q1-q14; (b) Attitudes towards educational, vocational and development policies q15-q28; (c) Culture of lifelong learning q29-q39; (d) Business strategy, value system and ethical perceptions q40-q49; (e) Evaluation policy of the participation in educational programmes q50-q55; (f) Trainee's orientation towards lifelong learning q56-q70; (g) Emotional identity of trainee q71-q76; (h) and Contemporary trends of lifelong learning q77-q80.

For each item of the instrument a 5-point Likert scale was used that ranged from 1- Strongly Disagree to 5- Strongly Agree.

Table A: Initial LLEHUREDE Scale

Please, choose only one of the 5 choices
Q1. I know what lifelong learning is.
Q2. Lifelong learning is to learn through the life span.
Q3. Lifelong learning is to learn until the retirement period.
Q4. Lifelong learning is clearly connected with schools and universities.
Q5. Lifelong learning is clearly connected with what people permanently learn from life (or better from the University of Life).
Q6. Lifelong learning is related to work-based learning.
Q7.Lifelong learning is all learning activities undertaken throughout life.
Q8. The basic aim of lifelong learning is to improve knowledge   within a personal, civic, social and/or employment-related perspective.
Q9. The basic aim of lifelong learning is to improve skills within a personal, civic, social and/or employment-related perspective.
Q10. The basic aim of lifelong learning is to improve competences within a personal, civic, social and/or employment-related perspective.
Q11. The basic aim of lifelong learning is to lead to behaviour change, after the deep understanding gained at the completion of the learning process.

Q12. Lifelong learning is concerned in planned, purposeful, and systematic learning.
Q13. Lifelong learning is worthwhile to every employee as it contributes to his/her development.
Q14. Lifelong learning includes non-formal and informal learning or otherwise liberal, vocational and learning with social dimensions.
Q15. I am responsible for my vocational training.
Q16. I work hard (on my own) toward achieving continuous professional development.
Q17. I get involved in lifelong learning activities as I contribute to organizational learning.
Q18. I draw on my skills in order to help to the organizational goals' achievement..
Q19. I am interested in participating in lifelong learning initiatives in order to continuously develop my skills.
Q20. The company or the organization I belong to is focused on customer service and therefore training is concentrated on it.
Q21. The company or the organization I belong to continually invest in its personnel education, training and development.
Q22. The company or the organization I belong to believes that we are well skilled under the training of our managers or other employees with better experience.
Q23. The company or the organization I belong to want from us to update our knowledge after our working hours.
Q24. The company or the organization I belong to believes that new knowledge is not necessary for those with a broad experience.
Q25. The company or the organization I belong to wants to have the responsibility of our education, training and development.
Q26. The company or the organization I belong to offer us opportunities to learn under its financial support.
Q27. The company or the organization I belong to chooses the educational/training programmes/courses under its financial support, without assessment of employees' educational needs.
Q28. The company or the organization I belong to is committed to improving its employees' performance (knowledge, skills, competences, behaviour) through training courses financially supported by EC or other particular bodies.
Q29. The company or the organization I belong to has a positive attitude towards lifelong learning.
Q30. The company or the organization I belong to has nothing to do with lifelong learning.
Q31. The company or the organization I belong to considers lifelong learning as useless when sales go down.
Q32. My belief is that lifelong learning leads to the wellbeing of the participants in learning process.
Q33. My belief is that lifelong learning leads to the change of the attitude towards the value of work.
Q34. My belief is that lifelong learning should promote each employee's creativity.
Q35. My belief is that lifelong learning leads to job satisfaction.
Q36. My belief is that lifelong learning leads to innovative ideas.
Q37. My belief is that lifelong learning leads to better job performance.
Q38. My belief is that involvement in lifelong learning activities reinforces the motivation for learning.
Q39. My belief is that experience leads to better job performance.
Q40. The company or the organization I belong to tries to make learning accessible to everyone.
Q41. The company or the organization I belong to considers its employees as an important asset.
Q42. The company or the organization I belong to considers mentoring as suitable to the development of employees' talents.
Q43. The company or the organization I belong to thinks that whatever is the change it can be successful when it is accompanied by mentoring programmes.
Q44. The company or the organization I belong to regards mentoring as the most important way for achieving the highest job performance by any employee.
Q45. The company or the organization I belong to regards lifelong strategy as a strategy that creates value.
Q46. The company or the organization I belong to promotes teamwork and fosters an environment for exchanging ideas useful for work improvement.
Q47. The company or the organization I belong to invests in its staff training because it considers it as necessary for gaining competitive advantage.
Q48. The company or the organization I belong to is socially responsible, which is obvious from its educational policy.
Q49. The company or the organization I belong to believes that knowledge is a generic source the dissemination of which is valuable.
Q50. The company or the organization I belong to rewards our participation in educational programmes useful for our performance enhancement.
Q51. The company or the organization I belong to assess our educational/training needs before allowing us to participate in any educational/training program/course.
Q52. The company or the organization I belong to review the benefits of our participation in training programmes/courses.
Q53. The company or the organization I belong to evaluates the benefit of participation in educational or training courses in relation with cost after the end of the program.

Q54. The company or the organization I belong to measures the outcomes of our participation in learning activities monitored by our manager or people in charge of our work-team.
Q55. The company or the organization I belong to evaluates the learning outcomes of training courses in order to these to be in alignment with the training goals set by the provider of learning activities.
Q56. I prefer learning through loosely structured learning activities.
Q57. I prefer learning in flexible mentoring environments.
Q58. I prefer learning through problem solving.
Q59. I prefer self-managed learning.
Q60. I prefer the semi-structured learning activities with creative interaction but without great effort.
Q61. I prefer simple, safe, and structured environments under low control by the learner that help him/her to reach easily achievable goals.
Q62. I prefer to set my personal learning goals even though they are different from the other participants' goals.
Q63. I do not believe in formal educational activities (e.g. of schools; of universities) as positive, necessary or enjoyable learning activities.
Q64. I prefer learning through working with others toward shared goals.
Q65. I prefer learning through benchmarking (information about best practices) and comparison with others' performance.
Q66. I prefer learning through social relationships or networking without any kind of discrimination.
Q67. I prefer learning through technology intervention.
Q68. I prefer learning either in face- interaction or through internet.
Q69. I prefer learning through critical thinking activities.
Q70. I prefer learning when it is urgently necessary.
Q71. I really try to actively participate by expressing my feeling when I actively participate in collaborative learning when discussion, or action or playing roles is selected as learning method.
Q72. I really try to appear my emotions when I actively participate in learning activities.
Q73. I try to understand the emotions of other participants in order to enjoy collaborative learning.
Q74. I slightly go through my emotions by expressing feelings that I do not really have.
Q75. I hide my real emotions when I have to share them during a learning activity in which talking about my personal experience is required.
Q76. I deny expressing my emotions when I take part in learning activities based on active learning or simulation of real events.
Q77. The provision of qualitative lifelong learning requires certification.
Q78. Human capital is related to self-directed learning, but it does not necessarily shares in organizational learning.
Q79. Collaborative learning is developed at a high extent when it is supported by computer and internet.
Q80. Knowledge acquisition should be included in lifelong learning strategy.

SAMPLE

The sample group of this research study consisted of 87 employees and employers who work at the same place in Greece. From all these participants, 39 (44.8%) were working at branches of their companies or organizations while 48 (55.2%) were working in their main establishment. Referring to their age distribution, 32 (36.8%) were in the age group of 18-29 years old, 19 (21.8%) were 30-39, 18 (20.7%) were 40-49, 16 (18.4%) were 50-59, 2 (2.3%) were 60-69. The percentage 35.6% (31) of the 87 respondents were men, while the rest 64.4% (56) were women.

With regard to the educational level, 1 (1.1%) has a gymnasium diploma, 10 (11.5%) have a high school diploma, 15 (17.2%) are graduates from IEK or other vocational faculty, 32 (36.8%) are graduates from Technological Educational Institution (T.E.I.), 16 (18.4%) are university graduates, and 1 (1.1%) has a doctorate. Concerning the theme of employment, the largest percentage 87.4% (76) of the respondents is employed in a company or an organization, 3.4% (3) is employed in a family company, and the rest percentage 9.2% (8) is self-employed. More specifically, the largest percentage 94.3% (82) of the 87 respondents is employed in companies and organizations of the private sector while the least 5.7% (5) is employed in the public sector. Regarding the kind of activity of either the company or the organization, data analysis revealed that 4 (4.6%) are employed in a product selling company, 2 (2.3%) in a productive company, 14 (16.1%) in a company with mixed activities (sale and production), and finally 67 (77%) in service provision organizations.

METHODOLOGY OF RELIABILITY TESTING

It is necessary to find the reliability of the questionnaire LLEHUREDE and we will try to check it through the usage of five models. But first of all, we have to mention that the sample of this pilot study was chosen by chance and all the variables-measurements are independent. The data for analysis was based on 5-Likert equal in strength rating. Also, every couple of variables had bivariate normality. Each item was linearly correlated with the sum of all the items which indicates that the type of the developed scale was an additive model (Dafermos, 2011). Moreover, statistics errors were uncorrelated within the various variables.

With the aim of analyzing the reliability of LLEHUREDE Scale we decided to apply the following five models:

1. Model **Alfa** (Cronbach's α). This measures the reliability of the measurement scale with the sense of internal consistency, it is based on the average of all the correlations of all the variables per two and it is independent from the setting of questions. Specifically, the evaluation of the reliability and internal consistency of the questionnaire is achieved by the contribution of the coefficient alpha (**α**) of Cronbach (Cronbach, 1984). According to Nunnally (1978) and (Dafermos, 2009) this coefficient is considered to be the most important coefficient and it is based on the number of the variables/items of the questionnaire and their interrelation. In addition, the coefficient alpha (**α**) is the most important coefficient of internal consistency and it is based on the average of all the variables' correlations and it is independent from their disposition (Anastasiadou, 2006).

2. Model **Spit-Half**. It divides the measurement scale in two, not necessarily, equal parts and furthermore, it examines whether the two parts have any correlation (Dafermos, 2009).

3. Model **Guttman.** It estimates the lowest limits of the coefficient for the real reliability.

4. Model **Parallel.** It assumes that all variables-items that constitute the measurement scale have equal variances and equal error variances within the structure of replications.

5. Model **Strict Parallel.** It has the same acceptances (acknowledgements) to the model parallel and is based on the assumption that all the items of the questionnaire have equal averages (Dafermos, 2009). As the Model Parallel as the Model **Strict Parallel** are tests that estimate the adjustment level of a notional structure to the available data. They also evaluate the common and the true dispersion, the common correlation of the variables and finally, provide with impartial reliability.

RESULTS OF THE RELIABILITY TEST

1.Model **Alfa** (Cronbach's α)

The following table Reliability Statistics (Table 1.1) give us the information that the value of the coefficient Cronbach α for the scale of the research study is 0.829= 82.9%. This percent gets over the 80 percent, which represents an extremely good value for the internal consistency of the notional structure of the exploratory scale (Anastasiadou, 2010; Dafermos, 2009; Dimitriadis**,** 2003; Nouris, 2006). If we try to release some units for example the standard values of the variables, then the coefficient Cronbach α takes the value α=0.840. In this way, it is slightly increased, which means that if we increase the number of items, the coefficient Cronbach α will take the value of 0.840.

Table 1.1: Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,829	,840	80

The Table 1.2 at its last column presents the coefficient Cronbach α of all the rest variables that remain and take part in the reliability analysis when this/ each specific item is missing from the scale.

Table 1.2: Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
q1	277,66	368,108	,076	,829
q2	277,43	368,624	,066	,829
q3	279,49	359,688	,212	,828
q4	278,84	369,197	-,001	,833
q5	278,41	369,068	,008	,832
q6	278,86	360,169	,210	,828
q7	277,57	369,872	,003	,831
q8	277,88	356,998	,377	,825
q9	277,91	365,191	,175	,828
q10	277,83	370,922	-,025	,831
q11	277,97	364,858	,151	,829
q12	278,63	360,778	,205	,828
q13	277,60	372,195	-,072	,831
q14	277,98	365,670	,154	,828
q15	277,78	362,621	,259	,827
q16	277,71	362,962	,242	,827
q17	278,08	361,323	,284	,826
q18	277,70	366,755	,148	,828
q19	277,73	360,645	,382	,825
q20	278,15	362,436	,217	,827
q21	278,08	356,946	,391	,824
q22	278,08	362,382	,260	,827
q23	278,55	362,345	,172	,828
q24	279,49	361,688	,170	,829
q25	278,16	361,056	,257	,827
q26	278,26	353,604	,417	,823
q27	278,98	365,341	,111	,830
q28	278,28	355,427	,339	,825
q29	277,85	358,412	,361	,825
q30	279,80	373,431	-,094	,833
q31	279,55	368,980	,011	,832
q32	277,94	361,726	,291	,826
q33	277,99	366,953	,104	,829
q34	277,71	368,820	,059	,830
q35	278,03	363,046	,243	,827
q36	277,86	362,898	,207	,828
q37	277,84	365,173	,151	,829
q38	277,76	361,998	,318	,826
q39	277,70	362,943	,272	,827
q40	278,10	355,860	,415	,824
q41	277,97	357,799	,389	,825
q42	278,02	362,917	,268	,827
q43	278,29	360,185	,324	,826
q44	278,27	357,398	,393	,825
q45	277,97	359,399	,437	,825
q46	277,87	361,407	,318	,826
q47	278,08	359,087	,365	,825
q48	278,12	355,092	,485	,823
q49	277,88	358,386	,389	,825
q50	278,38	353,792	,426	,823
q51	278,36	353,763	,431	,823
q52	278,33	353,916	,438	,823
q53	278,36	349,410	,552	,821
q54	278,42	353,164	,445	,823

q55	278,36	352,539	,485	,822
q56	278,78	368,551	,023	,832
q57	278,14	359,651	,294	,826
q58	277,95	363,057	,198	,828
q59	278,58	365,352	,094	,830
q60	278,59	361,115	,207	,828
q61	278,66	361,638	,205	,828
q62	278,17	363,252	,180	,828
q63	279,23	359,498	,249	,827
q64	277,84	367,761	,086	,829
q65	278,21	363,226	,183	,828
q66	278,12	361,822	,225	,827
q67	278,06	370,691	-,022	,832
q68	277,83	365,887	,122	,829
q69	277,71	361,785	,282	,826
q70	278,87	368,631	,014	,832
q71	278,06	367,820	,066	,830
q72	278,00	369,129	,045	,830
q73	277,97	362,811	,268	,827
q74	279,53	356,816	,366	,825
q75	279,59	357,021	,362	,825
q76	279,50	361,194	,219	,827
q77	278,55	362,980	,154	,829
q78	278,73	361,398	,204	,828
q79	278,27	364,810	,134	,829
q80	277,73	365,375	,178	,828

From the last column it is evident that if the item 30 is deleted from the reliability scale, the coefficient Cronbach α will get the value 0.833 instead of 0.829 which is a very low increase. Therefore, as there is no important benefit in case the specific item deleted, it is preferable to maintain it at the scale.

2. Model Spit-Half

At this model the scale is divided into two parts, accidently or not, and then the correlation and the internal consistency of the two parts are examined. These two parts may constitute of the same or different number of variables.

After the thinking out of the results from the following Table 3 (Reliability Statistics), it is clear that the splitting of the scale based on the Cronbach method created the first part which includes the variables

q1, q2, q3, q4, q5, q6, q7, q8, q9, q10, q11, q12, q13, q14, q15, q16, q17, q18, q19, q20, q21, q22, q23, q24, q25, q26, q27, q28, q29, q30, q31, q32, q33, q34, q35, q36, q37, q38, q39, q40 with a very good coefficient of internal consistency α=0.703, while the second part includes the variables q41, q42, q43, q44, q45, q46, q47, q48, q49, q50, q51, q52, q53, q54, q55, q56, q57, q58, q59, q60, q61, q62, q63, q64, q65, q66, q67, q68, q69, q70, q71, q72, q73, q74, q75, q76, q77, q78, q79, q80 with a satisfactory coefficient of consistency α=0.805. These two parts appear the coefficient of correlation r=0,414.

According to the coefficient Spearman-Brown and in case the two parts of the scale are equal in size, the reliability coefficient of Spearman-Brown has the value at the class equal to 0.586, whereas in case of parts unequal in size the value is the same, equal to 0.586. The two cases appear same values and thus, confirm that there is no problem with reliability.

In terms of the coefficient of Guttman the value of which is 0.577, it is obvious that there is no problem with the reliability of the created scale.

Table 3: Reliability Statistics

Reliability Statistics

Cronbach's Alpha	Part 1	Value	,703
		N of Items	40[a]
	Part 2	Value	,805
		N of Items	40[b]
	Total N of Items		80
Correlation Between Forms			,414
Spearman-Brown Coefficient	Equal Length		,586
	Unequal Length		,586
Guttman Split-Half Coefficient			,577

a. The items are: q1, q2, q3, q4, q5, q6, q7, q8, q9, q10, q11, q12, q13, q14, q15, q16, q17, q18, q19, q20, q21, q22, q23, q24, q25, q26, q27, q28, q29, q30, q31, q32, q33, q34, q35, q36, q37, q38, q39, q40.

b. The items are: q41, q42, q43, q44, q45, q46, q47, q48, q49, q50, q51, q52, q53, q54, q55, q56, q57, q58, q59, q60, q61, q62, q63, q64, q65, q66, q67, q68, q69, q70, q71, q72, q73, q74, q75, q76, q77, q78, q79, q80.

3. Model Guttman

Guttman suggests six measures of reliability test. The measures are L1, L2, L3, L4, L5, and L6 and they represent all the lowest limits of real reliability and their values are:

L1 is a simple reliability evaluation that constitutes the base on which all the remained lower limits can be estimated and its value is L1=0.819

L2 is a better reliability evaluation than the evaluations L1 and L3, but it introduces the problem of complication and its value is L2=0.849.

L3 is a better evaluation than this of L1, it has a higher value and it is also equal in strength to the coefficient of Cronbach α and its value is L3=0.829.

L4 is the coefficient of the Split- Half of Guttman, and it represents the lowest limit of the true reliability for every Split- Half test and its value equals to L4=0.577.

L5 is a better estimation than this of L2, when there is a variable that presents high convariance with the other variables for which it is not permitted to have high convariance among them and its value is L5=0.829.

L6 is a better evaluation than the evaluation of L2 when the intercorrelations of the variables are low while they are comparing with the coefficient R2. The coefficient R2 arises when one variable regress over the others and its value is L6=0.829.

Table 4: Reliability Statistics

Reliability Statistics

Lambda	1	,819	
	2	,849	
	3	,829	
	4	,577	
	5	,829	
	6	.	,829
N of Items		80	

4. Model Parallel

From the table 5 below (Reliability Statistics), we ascertain that the common variance of the scale equals to 0.840, all the items-variables that compose the measurement scale have the true Variance 0.048, the error variance is 0.057 and the common inter-item correlation 0.057. The reliability of the scale equals to 0.829, whereas the reliability of the scale (unbiased) equals to 0.833.

Table 5: Reliability Statistics

Reliability Statistics

Common Variance	,840
True Variance	,048
Error Variance	,792
Common Inter-Item Correlation	,057
Reliability of Scale	,829
Reliability of Scale (Unbiased)	,833

From the table 6 below (Test for Model Goodness of Fit) which imprints the level of adjustment of a comprehensive structure, we find out the unbiased reliability of the scale.

Table 6: Test for Model Goodness of Fit

Test for Model Goodness of Fit

Chi-Square	Value	-984,883
	df	3238
	Sig	1,000
Log of Determinant of	Unconstrained Matrix	,000
	Constrained Matrix	-16,936

Under the parallel model assumption

5. Model Strict Parallel

From the following table 7 (Reliability Statistics) of the Strict Parallel Model of Reliability we find out that the common mean of the scale equals to 3.522 and the common variance equals to 1.129. All the items-variables of the measurement scale have true variance 0.054, error variance 1.075, and common inter-item correlation 0.039. The reliability of the scale equals to 0.766, while the reliability of the scale (unbiased) equals to 0.774.

Table 7: Reliability Statistics

Reliability Statistics

Common Mean	3,522
Common Variance	1,129
True Variance	,054
Error Variance	1,075
Common Inter-Item Correlation	,039
Reliability of Scale	,766
Reliability of Scale (Unbiased)	,774

From the table 8 below (Test for Model Goodness of Fit) that provides the level of adjustment of the comprehensive structure according to the Strict Parallel model of Reliability we ascertain the unbiased reliability of the scale.

Table 8: Test for Model Goodness of Fit

Test for Model Goodness of Fit

Chi-Square	Value	466,369
	df	3317
	Sig	1,000
Log of Determinant of	Unconstrained Matrix	,000
	Constrained Matrix	7,932

Under the strictly parallel model assumption

Tukey's Test for Nonadditivity

The Tukey's Test for Nonadditivity evaluates the zero hypothesis Ho which is that the scale presents additivity. The table 9 below for nonadditivity (ANOVA with Tukey's Test for Nonadditivity) indicates a relatively observatory level of statistical significance and therefore the Ho is characterized as acceptable, which means that the model has additivity.

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Table 9: ANOVA with Tukey's Test for Nonadditivity

ANOVA with Tukey's Test for Nonadditivity

			Sum of Squares	df	Mean Square	F	Sig
Between People			393,935	85	4,635		
Within People	Between Items		1989,539	79	25,184	31,817	,000
	Residual	Nonadditivity	2,833[a]	1	2,833	3,580	,059
		Balance	5312,291	6714	,791		
		Total	5315,123	6715	,792		
	Total		7304,662	6794	1,075		
Total			7698,598	6879	1,119		

Grand Mean = 3,52

a. Tukey's estimate of power to which observations must be raised to achieve additivity = 1,555.

Hotelling's T-Squared Test

Hotelling's T-Squared	F	df1	df2	Sig
9025,771	9,409	79	7	,002

Intraclass Correlation Coefficient

		95% Confidence Interval		F Test with True Value 0			
	Intraclass Correlation[a]	Lower Bound	Upper Bound	Value	df1	df2	Sig
Single Measures	,057[b]	,041	,082	5,855	85	6715	,000
Average Measures	,829[c]	,774	,877	5,855	85	6715	,000

Two-way mixed effects model where people effects are random and measures effects are fixed.

a. Type C intraclass correlation coefficients using a consistency definition-the between-measure variance is excluded from the denominator variance.

b. The estimator is the same, whether the interaction effect is present or not.

c. This estimate is computed assuming the interaction effect is absent, because it is not estimable otherwise.

CONCLUSIONS

The new scale for measuring attitudes towards lifelong learning and human development, named LLEHUREDE scale, the reliability of which has been verified by the implementation of five models such as the Model Alfa (Cronbach's α), the Model Spit-Half, the Model Guttman, the Model Parallel and the Model Strict Parallel, tends to be useful to human resource professionals, and theorists and researchers who are dealt with human resource development and management.

To sum up, emphasis should be put on human resource development through investments in lifelong learning activities. As human resources are non-imitable and unique, their development either at personal or organizational level tends to be the most valuable resource of improving organizational performance. Furthermore, lifelong learning activities can be the longitudinal path to the continuous improvement of every enterprise and organization. In addition, lifelong learning can be the main determinant of human resource development when human resource development is decided to be an effective defensive mechanism to the competition in business environment.

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