

EXPLORING THE DEVELOPMENT OF THE KOLB EXPERIENTIAL LEARNING PROFILE IN JAPANESE

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Abstract

The aim of this study was to develop the Japanese version of the Kolb Experiential Learning Profile (KELP). To achieve this aim, we applied 147 Japanese undergraduates and adopted a test-retest approach at a 5-week interval. Results of the paired t-test indicated no significant difference between them concerning six key learning style variables, suggesting the measurement stability of the Japanese version. As for scale reliabilities, Cronbach's alphas of four scales within the Japanese version stayed at an acceptable range except a reflective observation scale. In terms of construct validity, results of a factor analysis revealed that a component of active experimentation served as a cross-loading to bipolar factors, indicating a room for improvement on the construct validity. To improve the Japanese version, we further created the modified version of Japanese KELP, collecting the additional data from 63 Japanese undergraduates. Results of the internal consistency test illustrated that Cronbach's alphas of all four scales of the modified version were acceptable. Results of a factor analysis indicated strong bipolar structure without an issue of cross-loading. Those results drew us to conclude that the modified version of the Japanese KELP can be a proper measure to examine learning styles of Japanese people.

Keywords: *Kolb Experiential Learning Profile, Japanese version, scale development.*

1. Introduction

Kolb's experiential learning theory (Kolb, 1984; Kolb & Kolb, 2017) is one of the most influential learning theories (Kayes, 2002). It is conceived as one of the broadly used and disseminated learning style categories across multiple academic areas (Desmedt & Valcke, 2004; Hawk & Shah, 2007). To examine individual's learning style and process, Kolb initially invented the Kolb Learning Style Inventory (KLSI) in 1970s (Kolb & Kolb, 2021). Its latest assessment tool is the Kolb Experiential Learning Profile (KELP; Kolb & Kolb, 2021), which has been improved through six previous versions for over 50 years (Kolb & Kolb, 2021). Consequently, it can be observed that the KELP has been well established as reliable and valid measurement (Kolb & Kolb, 2021).

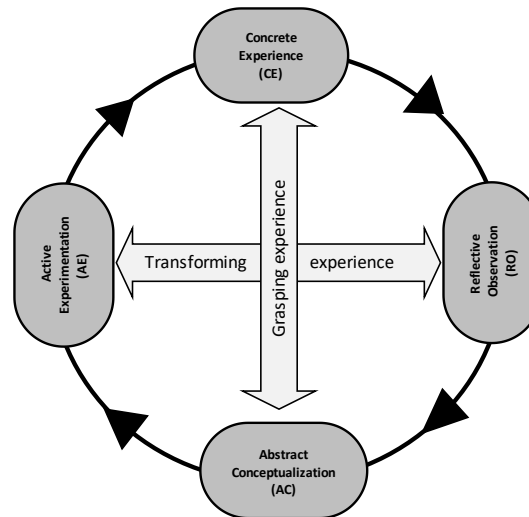
The KELP which is in English as the original version is broadly used worldwide. Although the previous versions of the KELP, that is the KLSI, were translated into various foreign languages (Kolb & Kolb, 2021), the KELP as a newest tool has not been much translated into other languages. Since the KELP includes the additional question-items of learning flexibilities (Kolb & Kolb, 2021), it is considered as being quite important to translate it into other foreign languages. This study paid much attention to this gap and intended to fill it. Particularly, we sought to create a Japanese version of the KELP, which has not been translated, yet. Accordingly, the purpose of the present study was to develop the Japanese version of the KELP. Before discussing a process of developing a Japanese version, we briefly reviewed the Kolb's experiential learning theory and its instruments of the KELP and its previous assessment of the KLSI.

2. Kolb's experiential learning theory

The Kolb's experiential learning theory (1984; Kolb & Kolb, 2005, 2017, 2021) shows us how to learn in learning situations. When people learn, they are required to use four learning modes: concrete experience (CE), abstract conceptualization (AC), reflective observation (RO), and active experimentation (AE). The CE plays an important role to grasp an experience by using sensing and feelings, which produces apprehensive knowledge. This knowledge is transformed by the RO mode, which relies on carefully watching and patiently listening. Through this transformative processing, such appreciative knowledge is

developed to comprehensive knowledge, which requires the AC mode. The AC mode serves to make people's experience explicitly in the forms of words, concepts, and numbers. The comprehensive knowledge subsequently becomes a basis for actively testing by using the mode of AE, which calls for taking action and initiatives, leading to a new experience. The CE mode and the AC mode are one dialectical relationship in the learning dimension of grasping experience, while the RO mode and the AE mode are the other in another learning dimension of transforming experience. Figure 1 shows Kolb's experiential learning model.

Figure 1. Kolb's experiential learning model.



3. Kolb Experiential Learning Profile (KELP)

The KELP, which is the latest assessment tool based on Kolb's experiential learning theory, has a total of 20 questions (Kolb & Kolb, 2021), while its previous version such as the KLSI 3.1 version (Kolb, 1999) is composed of 12 questions. Kolb and Kolb (2021) indicated that 12 questions of the KELP are similar to those of the KLSI 3.1 version, while 8 additional questions of the KELP are related to individual's learning in different learning situations. The 8 questions are designed to analyze individual's learning flexibility (Kolb & Kolb, 2021). For each question, there are four choices theoretically linked with the four modes of learning: concrete experience (CE), abstract conceptualization (AC), reflective observation (RO), and active experimentation (AE). The KELP asks people to determine the best option (most preferred), the second best, the third best, and the least preferred among the four learning modes. Hence, the KELP applies a forced-choice approach in alignment with the dialectical learning dimensions conceptualized into Kolb's experiential learning theory. To categorize an individual's learning style, two different learning scores from two learning dimensions respectively are necessary. One learning score shows a relative preference for AC over CE or vice versa (AC-CE), while the other score presents a relative preference for AE over RO or vice versa (AE-RO).

4. Methods

To achieve our purpose of developing a Japanese version of the KELP, this study performed two steps. The first step was to translate English to Japanese, completing a Japanese translated version. The second step was to test the psychometrics of the Japanese version. These two steps were guided by the study of Andreou et al. (2015) which developed the Greek version of the KLSI 3.1 version.

To translate the KELP in English into Japanese, this study specifically carried out a translation procedure used for cross-cultural studies, which Brislin Lonner, and Thorndike (1973) proposed the technique of translation and back-translation. The first and third authors independently translated the original English version to Japanese languages. Afterwards, the second author performed back-translation from the Japanese version into English. Then, the first and third authors compared its original and back-translated English and then revised some Japanese expressions, receiving the confirmation from the second author.

This study employed 143 Japanese undergraduate students at a department of business administration in Tokyo Japan. Since the present study utilized a test-retest examination to analyze a reliability and stability of the Japanese version of KELP, we collected data from Japanese students twice at a 5-weeks interval. The first and third authors explained to their classes in terms of the purpose of this study and then they asked students to participate into this Japanese translation project of the KELP. Table 1 presents the demographic characteristics of the 147 participants.

Table 1. Demographic Characteristics of 147 Undergraduate Students.

Demographics	N (%)	Demographics	N (%)
Gender male	90 (61)	Academic 1st year	29 (20)
female	57 (39)	2nd	56 (38)
Age <i>mean</i>	19.8	3rd	39 (27)
(years) <i>s.d.</i>	1.2	4th	23 (16)

5. Results

5.1. Reliability tests

Results of the internal consistency revealed that Cronbach's alphas of the first test were ranged from 0.74 to 0.84, while those of the second retest were ranged from 0.65 to 0.83. The Cronbach's alpha of reflective observation (RO) scale at the retest was only below the 0.70 value.

This study investigated the other reliability as measurement stability by analyzing scores of test-retest examinations. The present study performed a paired t-test of six key learning variables between the first and second tests. This approach was also used by the study of Andreou et al. (2015) developing the Greek KELP (ver. 3.1). Results of the paired t-test indicated no statistical significance of all six learning style variables: AC, CE, AE, RO, AC-CE, and AE-RO between test and retest, suggesting that student's preference for certain learning modes in a learning situation is stable at a 5-week interval. Thus, it can be interpreted that the Japanese version is reliable and stable as measurement.

5.2. Validity tests

According to the description about internal construct of the KELP, two bipolar factors should be produced—one generated by AC and CE scales scores, and the other yielded by AE and RO ones (Kolb & Kolb, 2021). Past psychometrics research on KLSI 3.1 version as a previous measure of the KELP demonstrated such two factors by applying principal component analysis with the method of varimax rotation (Andreou et al., 2015; Kayes, 2005). Results of the factor analysis on both the test and retest scores revealed two bipolar factors according to eigenvalue greater than 1 together with scree plot analysis. Because the sample size in this study was 147, which stays between 100 to 200, this study applied a factor loading of at least 0.5 as a cut-off point, which was suggested by Field (2013). With regard to the detail components of the bipolar factors extracted from the first test scores, Factor 1 was composed of three variables: AC, CE, and AE, while Factor 2 consisted of AE and RO. Those results indicated that AE is considered as a cross-loading function. Concerning the retest scores, Factor 1 was also composed of AC, CE, and AE, while Factor 2 possessed only RO. Although both results of the test and the retest showed two bipolar factor structure, it was suggested that AE and RO scales may need to be thoroughly scrutinized to improve construct validity. Table 2 summarized the results of principal component analysis with varimax rotation about the test and retest scores.

Table 2. Results of principal component analysis with varimax rotation.

Variables	Test		Retest	
	Factor 1	Factor 2	Factor 1	Factor 2
	Two-Factor Solution			
AC	-0.99	0.13	-0.99	-0.12
CE	0.70	0.32	0.60	-0.38
AE	0.53	0.55	0.68	-0.34
RO	0.00	-0.99	-0.11	0.99
Eigenvalue	1.99	1.15	2.06	1.02
Variance (%)	49.65	28.85	51.39	25.44
Cumulative (%)		78.49		76.83

5.3. Summary of results

Based on the study results, we found that the Japanese version of the KELP has a room for improvement on Cronbach's alpha of RO scale reliability in particular, as well as on the construct validity relevant to mainly connection between RO and AE. Accordingly, this study attempted to improve the Japanese version of the KELP by scrutinizing a translated question-items of Japanese from original English ones.

5.4. Study for scale improvement

In this section, we described the methods and results of the additional but crucial study for scale improvement on the Japanese version of the KELP.

Based on the weak question-items of each scale identified, the first author modified their words and expressions with keeping content validity of a certain learning mode. For example, a question item of a RO learning mode must be agreeable with its role and function based on Kolb's experiential learning theory. After the first author completed modifications in the Japanese version of KELP, the second and third authors independently checked the modifications, discussing modified items with the first author until reached consensus. To examine the reliability and construct validity of the modified version of the Japanese KELP, 63 Japanese undergraduate students at the same management department of the Japanese university participated in this further study.

We examined the internal reliability, Cronbach's alphas, of the modified version, resulting in an internal coefficient range from 0.74 (AE) to 0.84 (AC). A Cronbach's alpha of RO was greatly improved from 0.65 at the retest to 0.75 at this additional study

We analyzed the construct validity of the modified version using the principal component analysis with varimax rotation. Results of the factor analysis on the scores of the modified version revealed specifically two bipolar factors according to eigenvalue greater than 1 together with scree plot analysis. Factor 1 consisted of AC (factor loading = -0.95) and CE (factor loading = 0.84), while Factor 2 was composed of AE (factor loading= 0.78) and RO (-0.93). Those two factors did not have a cross-loading item with larger than factor loading of 0.30 as those did when the test and the retest were conducted. Results of the factor analysis indicated that the construct validity of the modified version was greatly improved in comparison with that of the test and the retest. Table 3 shows the results of principal component analysis with varimax rotation in terms of the modified version of Japanese KELP.

Table 3. Results of principal component analysis with varimax rotation for modified version.

Variables	Modified version	
	Factor 1	Factor 2
AC	-0.95	-0.08
CE	0.84	0.25
AE	0.26	0.78
RO	-0.06	-0.93
Eigenvalue	2.18	1.05
Variance (%)	54.49	26.25
Cumulative (%)	80.74	

6. Conclusions

Our study aimed to develop a Japanese version of the KELP. This study conducted two phases for the development of the KELP in Japanese. First, our initial tests of scale reliability and validity resulted in a room for improvement on Cronbach's alpha of RO scale reliability and the construct validity relevant to mainly connection between RO and AE. Second, we attempted to improve those psychometric properties of the KELP in Japanese. Subsequently, this study modified the Japanese KELP and investigated the psychometric properties, describing acceptable statistics concerning the modified version of the KELP. Accordingly, those results drew us to conclude that the modified version of the Japanese KELP can be a proper measure to examine learning styles of Japanese people.

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