Forum for Linguistic Studies 2023; 5(3): 1701.
Original Article

A cross-cultural study of differential item functioning analysis of beliefs about Language Learning Inventory (BALLI)

Zahra Shahsavar[1], Reza Kafipour[1], Sara Kashefian-Naeeini[1,2,*], Peyman Jafari[3], Nooreen Noordin[4], Sayyidatul Fadlilah[5], Shudipta Sharma[6]

[1] *Department of English Language, School of Paramedical Sciences, Shiraz University of Medical Sciences, Shiraz 7143914693, Iran*

[2] *Philosophy of Life and Healthy Lifestyle Research Center, Shiraz University of Medical Sciences, Shiraz 7193635899, Iran*

[3] *Department of Biostatistics, School of Medicine, Shiraz University of Medical Sciences, Shiraz 7134814336, Iran*

[4] *Faculty of Educational Studies, Universiti Putra Malaysia, Serdang 43400, Selangor, Malaysia*

[5] *Department of English Language Education, Universitas Islam Negeri Walisongo Semarang, Semarang, Jawa Tengah 50185, Indonesia*

[6] *School of Media and Communication, Bowling Green State University, Bowling Green, OH 43403, USA*

*** Corresponding author:** Sara Kashefian-Naeeini, kashefian@sums.ac.ir, kashefian@gmail.com

ARTICLE INFO

Received: 12 May 2023
Accepted: 19 October 2023
Available online: 19 December 2023

doi: 10.59400/fls.v5i3.1701

ABSTRACT: This research examines students' beliefs about language learning by evaluating the measurement equivalence of the beliefs about Language Learning Inventory (BALLI). The graded response model (GRM) was used to examine differential item functioning (DIF) in the BALLI across four different countries, namely: Iran, Malaysia, Indonesia, and Bangladesh. The sample was drawn from 1613, including 500 males and 1113 females who completed the online version of the BALLI, comprising five subscales of beliefs about foreign language aptitude, the difficulty of language learning, the nature of language learning, learning and communication strategies, and motivations and expectations. Most BALLI items showed non-uniform DIF. This finding implies that students in different countries had different perceptions of the BALLI items. Therefore, researchers should be very cautious about using the BALLI in different countries. This cross-cultural comparison may generate new insights into revising the BALLI items or developing another scale to compare students' beliefs about language learning in different countries.

KEYWORDS: BALLI; cross culture; differential item functioning; language belief; perceptions; university students

1. Introduction

Nowadays, the world is rapidly becoming a global village in a real sense. To communicate in such a village, more people use English for different purposes, including multiculturalism, business, tourism, education, and international relations. According to Balan (2021), English is one of the commonest languages in national and international publications. This circumstance shows the importance of English as a means of communication and why it is attracting the attention of more and more people as a means that facilitates and speeds up progress in life and enhances social status and job opportunities (Altan, 2012). For this reason, researchers investigated different aspects of language learning and teaching (Solikhah and Budiharso, 2022; Thaba and Baharuddin, 2022; Ramos et al., 2022; etc.).

Due to the importance of language, many studies have focused on investigating different factors and individual differences which may affect language teaching and learning, including beliefs about language learning (Park, 1997; Yang, 1999), solving problems in fulfilling language learning skills (Shahsavar and Kourepaz, 2020), cultural background (Oxford, 1996; Oxford and Burry-Stock, 1995; Politzer and McGroarty, 1995), social context (Parks and Raymond, 2004), teacher's attitude (Kustati et al., 2020; Nourinezhad and Kashefian-Naeeini, 2020), learning styles (Ehrman and Oxford, 1989), motivation (Kim-Yoon, 2000; Oxford and Nyikos, 1989; Ramirez, 1986) and leadership (Indra et al., 2020).

According to Asbjornson (2000), language learning is a process that is not limited to a short span of life; instead, it extends throughout a person's life. Recently, more pivotal roles have been allocated to language learners, and learner-centered instruction is developing in language learning. Therefore, learners actively participate in language learning instead of passively receiving the instruction. In the post-method era, many teaching methods which accentuated teacher-centered education are deemphasized, and more prominent roles are delivered to learners. Those learners endowed with the ability to conduct the demanding learning task are more predisposed to succeed on a life-long basis. Several factors may thwart or facilitate learning in language learners. Therefore, the primary factors should be carefully examined, and their effects should never be overlooked. Learners' beliefs and attitudes may encourage them to take the lead and forge ahead or discourage them or let them down. Beliefs can make learning easy or hard as they indicate truths held by learners.

As noted above, students' beliefs about language learning are fundamental to figure out the etiology of learning strategies, and perceiving beliefs about language learning is crucial in selecting appropriate teaching styles and learning strategies (Gürsoy and Eken, 2018; Horwitz, 1987; Horwitz, 1999). Beliefs about language learning are an influential factor that has received attention in language learning because language studies are becoming more and more learner-centered. In learner-centered instruction, it is a matter of paramount importance to direct less successful learners to use learning strategies and techniques to promote their success individually in language learning because learners who are endowed with the ability to make appropriate use of learning strategies are more predisposed to succeed and achieve their educational goals (Kashefian-Naeeini and Sheikhnezami-Naeini, 2020).

According to Horwitz (1999), language learning beliefs consist of an idea, notion, and attitude, whether positive or negative, which may influence the learners' performance and their choice of learning strategies directly or indirectly. She notes that beliefs about language learning are a vital component of every discipline that deals with human behavior (Horwitz, 2007). These beliefs are a core part of research in education because they have a significant role in learners' progress (Kormos et al., 2008; Dörnyei, 2005).

Other studies indicate that students are usually influenced by their pre-existed beliefs about any task. These beliefs may influence how they process and understand target information (Puchta, 1999; Stevick, 1980). It is also true in language classrooms that students' beliefs affect how they interact with instructors and classmates and how they deal with learning and teaching tasks. If language learners have true beliefs about language learning, such beliefs will motivate them in the learning process, while untrue beliefs or what Cui calls "unrealistic beliefs" may demotivate them and lead them to unsuccessful language learning (Cui, 2014, p. 2).

The context and culture that influence learners' beliefs about learning may lead to changes in their learning behavior. These beliefs may differ in bilingual or monolingual contexts and socio-cultural or educational contexts. To prevent misunderstandings between teachers and learners that may arise from

a lack of experience with social and cultural differences, teachers must familiarize themselves with learners' language beliefs and consider them during teaching (Horwitz, 1988).

As noted above, various factors influence learners' beliefs and attitudes (Ajzen, 2005); to this end, an arduous endeavor seems essential to evaluate the influence of beliefs and attitudes, but the main obstacle is that language learners' belief system cannot be easily examined nor comprehended due to its complexity (Alhamami, 2019). To solve the problem, in the 1970s and 1980s, survey instruments were formed to operationalize learners' beliefs and attitudes. Horwitz's (1987) study is among the first to systematically examine learners' beliefs about language learning by developing the beliefs about Language Learning Inventory (BALLI).

According to Abdi and Asadi (2015), the BALLI has been vastly used in different contexts and cultures to assess EFL/ESL students' beliefs (e.g., Harrington and Mantle-Bromley, 1995; Kern,1995; Oh, 1996; etc.).

Bernat (2006) adapted the BALLI to compare Australian students' learning beliefs with Americans. Likewise, Altan (2006) employed the BALLI to compare 436 English, French, German, Arabic, and Japanese learners' beliefs. He found the similarity of individuals' beliefs among different target language groups. Ariogul et al. (2009) compared English, German, and French language groups' beliefs among the categories of the BALLI and identified the areas of similarity and difference. All three groups have different language beliefs on BALLI items. In another study, Al Bataineh (2019) adapted the BALLI to examine male and female students' English learning beliefs in Jordan. Eighty-three university students (35 males and 48 females) majoring in English took part in this study. The T-test results showed that both male and female students had the same learning belief in three aspects of the BALLI (i.e., foreign language aptitude, nature of language learning, learning and communication strategies).

Although the BALLI was developed many years ago, it has been frequently used in EFL/ESL studies in different counties such as the USA (Oh, 1996), Jordan (Vibulphol, 2004), Malaysia (Nikitina and Furuoka, 2006), Korea (Jee, 2016), Turkey (Gürsoy and Eken, 2018), Iran (Sadeghi and Abdi, 2015), Saudi Arabia (Albataineh, 2019), and Ecuador (Santos and Veiga, 2022). To our best of knowledge, none of the above studies has used differential item functioning (DIF) to provide evidence of whether students in different countries perceive the meaning of the items in the questionnaire consistently. To fill the gap, this study tries to investigate students' beliefs about language learning by evaluating the measurement equivalence of the BALLI in four countries (i.e., Iran, Malaysia, Indonesia, and Bangladesh). Based on the objective, the current cross-cultural study seeks to answer the following research question:

Are there any significant cross-cultural differences between students' responses to the BALLI items based on their perception of the items in four countries (i.e., Iran, Malaysia, Indonesia, and Bangladesh)?

2. Method

2.1. Participants

This cross-cultural study followed the quantitative method. The sample was drawn from 1613, including 500 male and 1113 female students who studied in four countries, namely, Iran (n = 362), Malaysia (n = 130), Indonesia (n = 914), and Bangladesh (n = 207). The participants, who voluntarily participated in this study, were between 17 and 48 years old (M = 21.91; SD = 2.77). They were undergraduate students whose first language was not English.

2.2. Instruments

This study adapted the BALLI developed by Horwitz (1987). It consists of 34 items in a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree), which is used to assess beliefs about language learning in five categories: beliefs about foreign language aptitude, beliefs about the difficulty of language learning, beliefs about the nature of language learning, beliefs about learning and communication strategies, and beliefs about motivations and expectations (Al-Malki, 2018). The main reason for selecting the BALLI in this cross-cultural study was that it has been frequently used in EFL/ESL studies in different counties such as the USA (Kern 1995), Turkey (Gürsoy and Eken, 2018), and Ecuador (Santos and Veiga, 2022).

2.3. Procedure

To apply the BALLI questionnaire, the authors considered the potential differences in language and cultural norms among the participants. To do so, the authors asked two professional translators of each country to accurately translate the BALLI items into their own language. Since cultural differences may affect the interpretation of the questionnaire items in different languages, all translators tried to develop a concise translated version of the BALLI. To solve the potential problems in translating BALLI into four different languages and improve the quality of the translated version of the BALLI, all translators scheduled a meeting in zoom and shared their ideas before using the finalized BALLI version in their language.

2.4. Data collection

Data were collected online from four countries, namely Iran, Malaysia, Indonesia, and Bangladesh. Consent forms and questionnaires were distributed online in these countries to ensure convenience and cost-effectiveness. Given the cross-cultural nature of the study, participants were provided with a consent form that clearly stated the purpose of the study and emphasized the importance of honesty in filling out the questionnaire. The data collection process utilized the "Google Forms" survey platform, which can accommodate multiple languages.

2.5. Data analysis

The authors applied the GRM to assess DIF in the BALLI. The mathematical formula is as follows:

$$Pjk = + \frac{e^{aj(\theta - bjk)}}{1 + e^{aj(\theta - bjk)}}$$

The formula presents the scoring probability in or above category k of item j, aj shows the item discrimination (or slop) parameter, bjk represents the threshold or the boundary location for category k of item j, and θ shows a latent ability level or a latent construct. The higher bjk parameters would probably be endorsed by students who have positive beliefs about language learning than those who have negative beliefs.

The authors also tried to identify two DIF types, including uniform and non-uniform, based on GRM. Uniform DIF occurs when the direction of DIF is evident across the scale, while non-uniform DIF is constant when the direction of DIF differs along the length of the constructed scale. In a word, Non-uniform DIF will be detected if the discrimination parameters are significant among different groups (Shahsavar and Jafari, 2018). The IRTPRO2.1. was applied to identify uniform and non-uniform DIF.

3. Results

This study investigates potential cross-cultural differences in students' responses to the BALLI items based on their perception of the items in four countries: Iran, Malaysia, Indonesia, and Bangladesh. To achieve this, multiple comparisons of the BALLI items were conducted to assess differential functioning across the countries. These comparisons are presented based on the five BALLI subscales: foreign language aptitude, the difficulty of language learning, the nature of language learning, learning and communication strategies, and motivation and expectations. To identify students' perceptions of the BALLI items, uniform and non-uniform differential item functioning (DIF) analyses were applied (refer to **Table 1** for details).

Table 1. The multiple comparison of BALLI items of differential functioning across four countries.

		Iran-Indonesia		**Iran-Malaysia**		**Iran-Bangladesh**	
Subscale	**item**	**Uniform DIF**	**Non-uniform DIF**	**Uniform DIF**	**Non-uniform DIF**	**Uniform DIF(p)**	**Non-uniform DIF**
Foreign language aptitude	B1	0.4(0.5081)	62.9(0.0001)	0.6(0.4259)	14.0(0.0074)	4.7(0.0293)	7.2(0.1244)
	B2	0.4(0.5115)	43.6(0.0001)	0.3(0.5660)	14.9(0.0049)	0.1(0.7675)	6.3(0.1795)
	B6	1.1(0.2872)	33.2(0.0001)	5.3(0.0211)	4.8(0.3063)	0.7(0.3872)	44.0(0.0001)
	B10	0.3(0.5772)	73.8(0.0001)	0.1(0.7311)	17.8(0.0013)	1.2(0.2699)	10.7(0.0299)
	B11	1.0(0.3256)	223.2(0.0001)	0.9(0.3332)	4.5(0.3472)	0.0(0.8626)	7.1(0.1326)
	B16	1.5(0.2291)	58.7(0.0001)	0.3(0.5661)	28.3(0.0001)	3.1(0.0775)	7.6(0.1069)
	B19	3.4(0.0634)	14.4(0.0062)	1.3(0.2526)	6.7(0.1541)	0.0(0.9763)	7.3(0.1206)
	B30	2.6(0.1069)	31.1(0.0001)	3.3(0.0702)	21.8(0.0002)	0.0(0.9838)	21.9(0.0002)
	B33	47.5(0.0001)	54.7(0.0001)	16.0(0.0001)	39.8(0.0001)	0.0(0.8917)	6.7(0.1509)
Difficulty of language learning	B3	6248.6(0.000)	9128.9(0.0001)	5.0(0.0248)	25.5(0.0001)	8.5(0.0035)	30.2(0.0001)
	B4	0.3(0.6060)	184.9(0.0001)	0.0(0.9440)	20.0(0.0005)	1484.09(0.0001)	2855.1(0.0001)
	B15	97.8(0.0001)	405.3(0.0001)	1.0(0.3258)	20.9(0.0003)	284.2(0.0001)	1285.9(0.0001)
	B25	31.5(0.0001)	124.2(0.0001)	11.6(0.0007)	302.6(0.0001)	41.8(0.0001)	157.2(0.0001)
	B34	38.5(0.0001)	45.3(0.0001)	35.8(0.0001)	39.1(0.0001)	10.3(0.0014)	46.7(0.0001)
The Nature of Language Learning	B8	0.0(0.9553)	128.7(0.0001)	0.8(0.3820)	3.9(0.4211)	0.1(0.7825)	13.1(0.0109)
	B12	0.0(0.0844)	89.7(0.0001)	5.2(0.0221)	6.5(0.1614)	0.7(0.4101)	19.6(0.0006)
	B17	4.0(0.0447)	18.1(0.0012)	1.0(0.3175)	5.4(0.2503)	5.4(0.0196)	4.6(0.3378)
	B23	0.4(0.5518)	63.1(0.0001)	3.0(0.0845)	23.5(0.0001)	2.0(0.1569)	8.1(0.0881)
	B27	9.8(0.0018)	93.5(0.0001)	0.3(0.5607)	1.9(0.7495)	0.3(0.6001)	5.3(0.2548)
	B28	0.4(0.5283)	51.3(0.0001)	2.0(0.1536)	7.9(0.0963)	0.3(0.5628)	19.2(0.0007)
Language and communication strategies	B7	0.2(0.6204)	17.9(0.0013)	11.5(0.0007)	5.1(0.2756)	48.4(0.0001)	512.6(0.0001)
	B9	29.9(0.0001)	84.6(0.0001)	21.3(0.0001)	59.5(0.0001)	15.1 (0.0001)	120.1(0.0001)
	B13	0.5(0.4590)	105.2(0.0001)	3.8(0.0527)	38.4(0.0001)	1.2(0.2737)	5.5(0.2407)
	B14	0.5(0.4950)	38.2(0.0001)	9.5(0.0020)	47.4(0.0001)	12.4(0.0004)	2.2(0.6987)
	B18	47.8(0.0001)	37.9(0.0001)	5.8(0.0165)	39.3(0.0001)	2.8(0.0940)	17.6(0.0015)
	B21	0.0(0.9191)	37.5(0.0001)	7.5(0.0060)	20.2(0.0005)	0.0(0.9183)	13.7(0.0082)
	B22	8.4(0.0038)	38.6(0.0001)	26.1(0.0001)	41.2(0.0001)	9.8(0.0017)	146.0(0.0001)
	B26	0.8(0.3624)	21.5(0.0002)	10.7(0.0011)	10.5(0.0324)	2.0(0.1603)	11.6(0.0205)
Motivation and expectations	B5	20.6(0.0001)	17.8(0.0014)	0.3(0.5628)	12.9(0.0120)	1.7(0.1938)	17.3(0.0017)
	B20	4.1(0.0427)	30.9(0.0001)	0.5(0.4760)	19.8(0.0005)	0.9(0.3430)	51.2(0.0001)
	B24	0.4(0.5095)	21.6(0.0002)	0.7(0.3977)	6.8(0.1461)	1.5(0.2260)	35.4(0.0001)
	B29	7.2(0073)	20.0(0.0005)	0.5(0.4672)	4.1(0.3904)	6.2(0.0126)	3.6(0.4708)

Table 1. (*Continued*).

		Iran-Indonesia		Iran-Malaysia		Iran-Bangladesh	
Subscale	**item**	**Uniform DIF**	**Non-uniform DIF**	**Uniform DIF**	**Non-uniform DIF**	**Uniform DIF(p)**	**Non-uniform DIF**
	B31	0.6(0.4572)	17.1(0.0019)	0.1(0.7475)	4.0(0.4034)	1.9(0.1646)	3.0(0.5648)
	B32	15.2(0.0001)	70.5 (0.0001)	1.8(0.1849)	9.0(0.0619)	9.0(0.0027)	51.7(0.0001)
Foreign language aptitude	B1	2.8(0.0940)	20.0(0.0005)	2.4(0.1205)	39.3(0.0001)	1.8(0.1864)	22.1(0.0002)
	B2	2.5(0.1162)	10.5(0.0331)	0.8(0.3812)	22.3(0.0002)	0.2(0.6745)	1.7(0.7826)
	B6	0.0(0.9417)	32.2(0.0001)	0.3(0.5660)	71.8(0.0001)	3.0(0.0831)	23.5(0.0001)
	B10	4.5(0.0333)	7.9(0.0952)	4.0(0.0451)	34.6(0.0001)	0.0(0. .8432)	3.4(0.4939)
	B11	2.3(0.1332)	9.4(0.0522)	1.6(0.2055)	160.3(0.0001)	0.2(0.6815)	75.5(0.0001)
	B16	9.0(0.0027)	26.3(0.0001)	3.1(0.0805)	40.8(0.0001)	8.2(0.0041)	31.2(0.0001)
	B19	3.7(0.0553)	1.3(0.8639)	3.5(0.0613)	1.4(0.8441)	0.3(0.6157)	4.1(0.3939)
	B30	5.5(0.0185)	12.6(0.0131)	3.0(0.0828)	32.9(0.0001)	1.0(0.3274)	2.5(0.6421)
	B33	7.9(0.0050)	21.5(0.0003)	24.2(0.0001)	21.8(0.0002)	4.9(0.0266)	1.0(0.9052)
Difficulty of language learning	B3	1.0(0.3152)	46.9(0.0001)	0.4(0.5315)	27.8(0.0001)	63.1(0.0001)	135.8(0.0001)
	B4	282.6(0.0001)	1538.3(0.0001)	19.6(0.0001)	132.6(0.0001)	0.1(0.7297)	30.9(0.0001)
	B15	47.6(0.0001)	280.2(0.0001)	-	-	0.3(0.5697)	29.6(0.0001)
	B25	1.7(0.1976)	16.9(0.0020)	0.0(0.9900)	127.1(0.0001)	0.4(0.5416)	25.4(0.0001)
	B34	1.2(0.2714)	13.2(0.0105)	26.4(0.0001)	295.3(0.0001)	0.2(0.6635)	9.7(0.0462)
The nature of language learning	B8	7.4(0.0064)	13.0(0.0113)	0.3(0.5990)	131.7(0.0001)	9.3(0.0022)	68.8(0.0001)
	B12	7.8(0.0051)	9.1(0.0593)	0.9(0.3347)	11.4(0.0225)	3.8(0.0506)	2.0(0.7447)
	B17	4.0(0.0462)	6.2(0.1844)	22.0(0.0001)	32.7(0.0001)	0.2(0.6607)	6.5(0.1635)
	B23	0.0(0.9614)	8.1(0.0886)	9.5(0.0020)	88.2(0.0001)	18.5(0.0001)	25.2(0.0001)
	B27	3.9(0.0474)	11.6(0.0209)	19.7(0.0001)	58.3(0.0001)	7.8(0.0052)	34.0(0.0001)
	B28	11.3(0.0008)	37.7(0.0001)	0.3(0.5652)	52.6(0.0001)	37.8(0.0001)	55.9(0.0001)
Language and communication strategies	B7	7.9(0.0049)	13.9(0.0075)	5.6(0.0176)	22.6(0.0002)	34.5(0.0001)	110.2(0.0001)
	B9	24.8(0.0001)	26.7(0.0001)	19.9(0.0001)	41.1(0.0001)	0.8(0. 3696)	35.5(0.0001)
	B13	1.2(0.2676)	73.6(0.0001)	0.0(0.8889)	8.3(0.0806)	6.2(0.0125)	85.2(0.0001)
	B14	10.1(0.0015)	26.4(0.0001)	17.2(0.0001)	69.1(0.0001)	2.4(0.1187)	17.1(0.0018)
	B18	1.1(0.2859)	9.7(0.458)	85.4(0.0001)	159.5(0.0001)	10.4(0.0013)	5.7(0.2270)
	B21	0.5(0.4947)	41.1(0.0001)	0.1(0.7016)	104.8(0.0001)	8.9(0.0029)	22.2(0.0002)
	B22	26.4(0.0001)	14.7(0.0053)	0.0(0.8893)	126.8(0.0001)	19.5(0.0001)	74.7(0.0001)
	B26	14.3(0.0002)	19.8(0.0005)	2.4(0.1214)	37.2(0.0001)	31.4(0.0001)	22.7(0.0001)
Motivation and expectations	B5	0.6(0.4334)	4.6(0.3301)	3.2(0.0745)	3.9(0.4202)	9.9(0.0016)	29.3(0.0001)
	B20	0.2(0.6767)	10.8(0. 0287)	0.1(0.7577)	63.9(0.0001)	1.3(0.2511)	53.1(0.0001)
	B24	2.9(0.0869)	27.7(0.0001)	4.2(0.0402)	77.8(0.0001)	0.0(0.8244)	11.2(0.0244)
	B29	3.0(0.0818)	7.7(0.1010)	1.1(0.2978)	22.2(0.0002)	1.2(0.2678)	5.8(0.2164)
	B31	1.2(0.2813)	4.6(0.3271)	1.5(0.2277)	2.9(0.5832)	0.0(0.9178)	13.1(0.0110)
	B32	1.6(0.2031)	9.7(0.0452)	0.9(0.3514)	23.6(0.0001)	1.8(0.1821)	17.7(0.0014)

Table 2 presents the items that exhibit uniform and non-uniform differential item functioning (DIF) across the four countries. A comparison between Iran and Indonesia reveals that all 34 items across the five subscales exhibit non-uniform DIF. When comparing Iran and Malaysia, 21 items show non-uniform DIF and 3 items show uniform DIF in the aptitude, nature, and communication subscales out of the total 34 items. The item comparisons between Iran and Bangladesh show 21 items with non-uniform DIF and 4 items with uniform DIF in the aptitude, nature, and communication subscales, respectively. Comparing

the items between Malaysia and Bangladesh, 25 items exhibit non-uniform DIF, while 3 items show uniform DIF in the aptitude and nature subscales out of the 34 total items. The comparison between Bangladesh and Indonesia reveals that 29 items display non-uniform DIF, and none exhibit uniform DIF. Lastly, when comparing Malaysia and Indonesia, 25 items demonstrate non-uniform DIF, while 2 items out of 34 items show uniform DIF in the aptitude, nature, and communication subscales, respectively.

Table 2. Number of items with non-uniform and uniform DIFs in four countries.

Subscale	Item	Iran-Indonesia	Iran-Malaysia	Iran-Bangladesh	Malaysia-Bangladesh	Bangladesh-Indonesia	Malaysia-Indonesia
Foreign language aptitude	B1	✓	✓	○	✓	✓	✓
	B2	✓	✓		✓	✓	
	B6	✓	○	✓	✓	✓	✓
	B10	✓	✓	✓	○	✓	
	B11	✓			✓	✓	✓
	B16	✓	✓		✓	✓	✓
	B19	✓				•	
	B30	✓	✓	✓	✓	✓	
	B33	✓	✓		✓	✓	○
Difficulty of language learning	B3	✓	✓	✓	✓	✓	✓
	B4	✓	✓	✓	✓	✓	✓
	B15	✓	✓	✓	✓	•	✓
	B25	✓	✓	✓	✓	✓	✓
	B34	✓	✓	✓	✓	✓	✓
The nature of language learning	B8	✓		✓	✓	✓	✓
	B12	✓	○	✓	○	✓	○
	B17	✓		○	○	✓	
	B23	✓	✓			✓	✓
	B27	✓			✓	✓	✓
	B28	✓		✓	✓	✓	✓
Language and communication strategies	B7	✓	○	✓	✓	✓	○
	B9	✓	✓	✓	✓	✓	✓
	B13	✓	✓		✓		✓
	B14	✓	✓	○	✓	✓	✓
	B18	✓	✓	✓		✓	
	B21	✓	✓	✓	✓	✓	✓
	B22	✓	✓	✓	✓	✓	✓
	B26	✓	✓	✓	✓	✓	✓
Motivation and expectations	B5	✓	✓	✓			✓
	B20	✓	✓	✓	✓	✓	✓
	B24	✓		✓	✓	✓	✓
	B29	✓		○		✓	
	B31	✓				•	✓
	B32	✓		✓	✓	✓	✓

Note: (✓) Indicates items with non-uniform DIF while (o) indicates items with uniform DIF.

Table 3 displays the mean and standard deviation of each subscale of the BALLI questionnaire across Iran, Indonesia, Malaysia, and Bangladesh. The comparison of the subscale mean scores across four countries is significant.

Regarding the aptitude subscale as shown in **Table 3**, there is a significant difference in item responses between Iran and the other three countries (Indonesia, Malaysia, and Bangladesh). Additionally, Indonesia exhibits a significant difference compared to Bangladesh. Malaysia also shows a significant difference compared to Bangladesh. The comparison of items within the aptitude subscale reveals that Bangladesh has the highest mean score, while Indonesia has the lowest mean score, indicating variations in aptitude perceptions across the four countries.

Table 3. The comparison of BALLI subscale score across four countries.

Subscale	Iran Mean ± SD	Indonesia Mean ± SD	Malaysia Mean ± SD	Bangladesh Mean ± SD	*P* value
Aptitude	2.49 ± 0.37[a]	2.37 ± 0.50[b]	2.38 ± 0.58[c]	2.65 ± 0.39	<0.001
Difficulty	2.60 ± 0.46[d]	2.64 ± 0.50[b]	2.63 ± 0.54[c]	2.50 ± 0.44	<0.001
Nature	2.54 ± 0.50[a]	2.25 ± 0.62[g]	2.39 ± 0.67[c]	2.25 ± 0.48	<0.001
Communication	2.22 ± 0.39[a]	2.51 ± 0.48[e]	2.71 ± 0.43	2.69 ± 0.44	<0.001
Motivation	1.96 ± 0.56[f]	2.04 ± 0.72[g]	1.73 ± 0.92[c]	1.98 ± 0.43	<0.001

Note:
[a] Shows the significant difference between Iran, Indonesia, Malaysia, and Bangladesh.
[b] Shows the significant difference between Indonesia and Bangladesh.
[c] Shows the significant difference between Malaysia and Bangladesh.
[d] Shows the significant difficulty difference between Iran and Bangladesh.
[e] Shows the significant difficulty difference between Indonesia, Malaysia, Bangladesh.
[f] Shows the significant difficulty difference between Iran and Malaysia.
[g] Shows the significant difference between Indonesia and Malaysia.

In the difficulty subscale, no significant difference was found between the items in Iran, Indonesia, and Malaysia, while Bangladesh has shown a significant difference with the three countries, as mentioned earlier. Indonesia and Bangladesh have the highest and the lowest difficulty scores, respectively.

In the nature subscale, the significant difference was observed between Iran and three countries (i.e., Indonesia, Malaysia, and Bangladesh). Although Indonesia has a significant difference from Malaysia and Bangladesh, no significant difference was found between Bangladesh and Malaysia. Malaysia and Iran have the highest and the lowest communication scores, respectively. Beyond that, Iran has the highest, while Indonesia and Bangladesh have the lowest nature scores.

In motivation subscale, a significant difference was shown in the items between Malaysia and three other countries (i.e., Iran, Indonesia, and Bangladesh). In contrast, no significant difference was found among other countries. Indonesia and Malaysia have the highest and the lowest difficulty scores, respectively.

Comparing different subscales of the BALLI items among four countries indicates that "difficulty of language learning", "language and communication strategies", "forging language aptitude", "motivation and expectations", and "the nature of languages learning" had the most non-uniform items, respectively. All items between Iran and Indonesia show non-uniform DIF. This finding may imply that students in these two countries did not have the same perception of the BALLI items. In other countries, most items show no uniform DIF as well. As a whole, students had different perceptions of the BALLI items.

4. Discussion

This study embarked on a rigorous cross-cultural exploration, delving into the intricate web of students' beliefs about language learning across four distinct countries: Iran, Indonesia, Malaysia, and Bangladesh. The primary objective was to examine students' perceptions of language learning beliefs while evaluating the measurement equivalence of the BALLI items in diverse educational contexts.

The results indicate that students in these four countries had different perceptions of the BALLI items. The result is consistent with Ariogul et al. (2009) who found different responses to the BALLI items among English, German, and French language group beliefs.

In the current study, the variation in students' perceptions of the BALLI subscales resonates with other studies. For example, the variation in responding to the "foreign language aptitude" supports Akter et al.'s (2022) findings. The divergence in the "difficulty of language learning" subscale aligns with Amrullah et al.'s (2018) findings in Indonesia, where students manifested weaker beliefs associated with difficulty. In responding to the items in the "nature of language" subscale, we found that Iranian students obtained significantly higher scores in comparison to the students in other countries. This may imply that Iranian allocated greater roles to different language skills and language components, and the natural environment in which a foreign language should be learned, while they obtained low scores in responding to the items in "learning and communication" subscale. Regarding "motivation and experience" subscale, this study provided confirmatory evidence that the students in four aforementioned countries did not have the same beliefs about this subscale towards language learning. The results confirm Ariogul et al.'s (2009) idea that the students had different language beliefs on the BALLI items, and their responses were strikingly contrastive.

On the other hand, our findings contradict the conclusions drawn by other researchers such as Bernat (2006) who identified that beliefs about language learning does not vary by contextual settings. Additionally, the results do not align with the study conducted by Horwitz (1999) who indicated that despite some differences in beliefs among American, Korean, and Turkish heritage groups, there were no clear cultural differences in responses to the BALLI items. Furthermore, the results differ from the findings of Altan (2006) who reported similar beliefs among English, French, German, Arabic, and Japanese language groups. Moreover, our outcomes invite critical comparisons with other researchers such as Bernat (2006) who found uniformity in beliefs about language learning. These differences may be attributed to evolving the nature of educational landscapes, cultural paradigms, and a shifting global context that shape students' language learning experiences.

The findings of this study have important implications for researchers utilizing the BALLI to assess not only students' but also teachers' language beliefs accurately. Educators interested in creating effective language learning environments can benefit from the results since ensuring the questionnaire accuracy allows more precise decision-making and improves research quality in education.

The findings may also assist educators in designing interventions that accurately examine students' beliefs and attitudes. This evaluation may potentially enhance students' learning outcomes. Therefore, highlighting the importance of understanding learners' beliefs before initiating the teaching process can avoid any mismatch and enhance educational program implemented by material developers and instructors.

Finally, it is worth noting that all aforementioned studies included in this article primarily focused on comparing the BALLI items at the scale level rather than the item level. None of them employed DIF

analysis to provide evidence regarding students' consistent perception of item meanings in the questionnaire. A further study with more focus on this issue is therefore suggested. Also, focusing on a limited number of countries requires caution in generalizing the findings. More diverse cultural spectrum could illuminate additional layers of belief formation.

5. Conclusion

This cross-cultural study conducted multiple comparisons of the BALLI items in four countries: Iran, Indonesia, Malaysia, and Bangladesh to assess the measurement equivalence of the BALLI in different educational settings using the DIF analysis method. The results revealed that the BALLI items exhibited context-specificity across the four countries. It means that the students in each country had distinct perceptions of the BALLI items. Therefore, to compare students' beliefs about language learning in different countries, researchers should be very cautious about using the BALLI in different contexts. They may revise BALLI items or develop another scale.

This study serves as an ode to the intricate dance between culture, context, and students' beliefs about language learning. The symphony of variation observed across Iran, Indonesia, Malaysia, and Bangladesh resonates with the findings of fellow researchers. Within these variations, educators find both the challenge and the opportunity to craft a harmonious educational narrative. As we navigate the global language education landscape, the melodies of belief, culture, and context intertwine, composing a rich tapestry that promises effective, inclusive, and transformative language learning experiences. By tending to these nuances, educators can become skillful conductors, orchestrating an educational symphony that resonates across borders and celebrates the mosaic of human diversity.

Author contributions

Conceptualization, ZS and RK; methodology, ZS and RK; software, PJ; validation, ZS, SKN and PJ; formal analysis, PJ; investigation, ZS and SKN; resources, ZS and SKN; data curation, NN, SS, SF and RK; writing—original draft preparation, ZS and SKN; writing—review and editing, ZS and RK; visualization, ZS; supervision, ZS and RK; project administration, ZS; funding acquisition, ZS. All authors have read and agreed to the published version of the manuscript.

Funding

This work has received financial support from the Shiraz University of Medical Sciences Research Council through grant number 98-01-10-19736.

Acknowledgments

We would like to extend our sincere gratitude to the Shiraz University of Medical Sciences for granting us permission to conduct this study. Additionally, we would like to express our appreciation to Nooreen Noordin, Sayyidatul Fadlilah, and Shudipta Sharma for their invaluable support in the data-gathering process in their respective locations. Their assistance has been instrumental in the successful execution of this study. Special thanks are due to all participants in Iran, Malaysia, Indonesia, and Bangladesh who took part in the present study.

Conflict of interest

The authors declare no conflict of interest.

References

Abdi H, Asadi B (2015). A synopsis of researches on teachers' and students' beliefs about language learning. *International Journal on Studies in English Language and Literature* 3(4): 104–114.

Ajzen I (2005). *Attitudes, personality, and behavior.* Maidenhead: Open.

Akter A, Islam A, Naznin N (2022). The beliefs of physiotherapy, occupational therapy, and speech and language therapy undergraduate students about learning English language. *World Journal of Advanced Research and Reviews* 13(1): 576–582. doi: 10.30574/wjarr.2022.13.1.0060

Al Bataineh KB (2019). English language learning beliefs of Jordanian students: The effect of gender. *International Journal of English Linguistics* 9(2): 219–228. doi: 10.5539/ijel.v9n2p219

Alhamami M (2019). Learners' beliefs about language-learning abilities in face-to-face & online settings. *International Journal of Educational Technology in Higher Education* 16(31): 1–23. doi: 10.1186/s41239-019-0162-1

Al-malki EA, Javid CZ (2018). Identification of language learning beliefs among Saudi EFL learners. *Arab World English Journal* 9(4): 186–199. doi: 10.24093/awej/vol9no4.13

Altan MX (2006). Beliefs about language learning of foreign language-major university students. *Australian Journal of Teacher Education* 31(2): 44–45. doi: 10.14221/ ajte. 2006v31n2.5

Altan MZ (2012). Pre-service EFL teachers' beliefs about foreign language learning. *European Journal of Teacher Education* 35(4): 481–493. doi: 10.1080/02619768.2011. 643399

Amrullah A, Vianty M, Fiftinova F (2018). Language learning beliefs of Indonesian English education study program students. *The Journal of English Literacy Education: The Teaching and Learning of English as a Foreign Language* 5(1): 62–70.

Ariogul S Unal DC, Onursal I (2009). Foreign language learners' beliefs about language learning: A study on Turkish university students. *Procedia Social and Behavior Sciences* 1(1): 1500–1506. doi: 10.1016/j.sbspro.2009.01.265

Arslan G, Kafes H (2021). Turkish prep school EFL students' beliefs about language learning. *International Online Journal of Education and Teaching* 8(2): 1312–1330.

Asbjornson B (2000). Do beliefs matter in language learning achievement? A pilot study. Retrieved on https://www.tuj.ac.jp/grad-ed/publications/working-papers/vol-14/asbjornson (accessed on 10 April 2023).

Balan S (2021). English as the language of research: But are we missing the mark? *Exploratory Research in Clinical and Social Pharmacy* 2(3): 100043. doi: 10.1016/j.rcsop.2021.100043

Bernat E (2006). Assessing EAP learners' beliefs about language learning in the Australian context. *Online Asian-EFL* 8(2): 1–19.

Carter BA (1999). Begin with beliefs: exploring the relationship between beliefs and learner autonomy among advanced students. *Texas Papers in Foreign Language Education* 4(1): 1–20.

Cui Y (2014). *Beliefs about Language Learning: A Study of Post-secondary Non-Native Learners of Chinese and Teachers of Chinese in North America* [PhD thesis]. University of Victoria.

Daif-Allah AS. (2012). Beliefs about Foreign Language Learning and Their Relationship to Gender. *English Language Teaching* 5(10): 20–33. doi: 10.5539/elt.v5n10p20

Dörnyei Z (2005). *The Psychology of the Language Learner: Individual Differences in Second Language Acquisition.* Routledge.

Ehrlich S (1997). Gender as social practice. Implications for second language acquisition. *Studies in Second Language Acquisition* 19(4): 421–446. doi: 10.1017/s0272263197004014

Ehrman M and Oxford RL (1989). Effects of sex differences, career choice, and psychological type on adult language learning strategies. *The Modern Language Journal* 73(1): 1–13. doi: 10.1111/j.1540-4781.1989.tb05302.x

Gürsoy E, Eken E (2018). Identifying children's language learning strategies: Turkish example. *Porta Linguarum,* 30: 43–56. doi: 10.30827/Digibug.54037

Harrington S, Hertel T (2000). Foreign language methods students' beliefs about language learning and teaching. *Texas Papers in Foreign Language Education* 5: 53–68.

Horwitz E (2007). *Becoming a Language Teacher: A Practical Guide to Second Language Learning and Teaching.* Pearson.

Horwitz EK (1987). Surveying student beliefs about language learning. In: Wenden A, Rubin J (editors). *Learner Strategies in Language Learning.* Prentice-Hall International. pp. 119–129.

Horwitz EK (1988). The beliefs about language learning of beginning university foreign language students. *The Modern Language Journal* 72(3): 283–294. doi: 10.1111/j.1540-4781.1988.tb04190.x

Horwitz EK (1999). Cultural and situational influences on foreign language learners' beliefs about language learning: A review of BALLI studies. *System* 27(4): 557–576. doi: 10.1016/s0346-251x(99)00050-0

Indra R, Kustati M, Saregar A, Warnis W, et al. (2020). The effect of principals' leadership towards effective learning at an Indonesian secondary school. *European Journal of Educational Research* 9(3): 1063–1074. doi: 10.12973/eu-jer.9.3.1063

Jee MJ (2016). Beliefs about language learning: A study of American University students learning Korean. *Language Research* 49(2): 399–418.

Kashefian-Naeeini S, Sheikhnezami-Naeini Z (2020). Communication skills among school masters of different gender in Shiraz, Iran. *International Journal of Advanced Science and Technology* 29(2): 1607–1611.

Kim-Yoon H (2000). Learner beliefs about language learning, motivation and their relationship: A study of EFL learners in Korea. *Dissertation Abstracts International* 61(8): 3041.

Kormos J, Csizér K, Menyhárt A, Török D (2008). "Great expectations": The motivational profile of Hungarian English majors. *Arts & Humanities in Higher Education* 7(1): 65–82. doi: 10.1177/1474022207084884

Kustati M, Yusuf YQ, Hallen, Al-Azmi H, Sermal (2020). EFL Teachers' attitudes towards language learners: A case of multicultural classrooms. *International Journal of Instruction* 13(1): 353–370. doi: 10.29333/iji.2020.13124a

Mantle-Bromley C. (1995). Positive attitudes and realistic beliefs: Links to proficiency. *The Modern Language Journal* 79(3): 372–386. doi: 10.1111/j.1540-4781.1995.tb01114.x

Nikitina L, Furuoka F (2006). Re-examining Horwitz's Beliefs About Language Learning Inventory (BALLI) in the Malaysian context. *Electronic Journal of Foreign Language Teaching* 3(2): 209–219.

Nourinezhad S, Kashefian-Naeeini S (2020). Iranian EFL university learners and lecturers' attitude towards translation as a tool in reading comprehension considering background variables of age, major and years of experience. *Cogent Education* 7(1): 1–23. doi: 10.1080/2331186x.2020.1746104

Oh MJ (1996). Beliefs about language learning and foreign language anxiety: A study of American university students learning Japanese [PhD thesis]. The University of Texas.

Oxford RL (1996). *Language Learning Strategies Around the World: Cross-Cultural Perspectives.* National Foreign Language Resource Center.

Oxford RL, Burry-Stock JA (1995). Assessing the use of language learning strategies worldwide with the ESL/EFL version of the strategy inventory of language learning (SILL). *System* 23(1): 1–23. doi: 10.1016/0346-251x(94)00047-a

Oxford RL, Nyikos M (1989). Variables affecting choice of language learning strategies by university students. *The Modern Language Journal* 73(3): 291–300. doi: 10.1111/j.1540-4781.1989.tb06367.x

Park GP (1997). Language learning strategies and English proficiency in Korean University students. *Foreign Language Annal* 30(2): 211–221. doi: 10.1111/j.1944-9720.1997.tb02343.x

Parks S, Raymond P (2004). Strategy use by nonnative-English-speaking students in an MBA program: Not business as usual. *Modern Language Journal* 88(3): 374–389. doi: 10.1111/j.0026-7902.2004.00235.x

Politzer R, McGroarty M (1985). An exploratory study of learning behaviors and their relationship to gains in linguistic and communicative competence. *TESOL Quarterly* 19(1): 103–124. doi: 10.2307/3586774

Puchta H (1999). Beyond materials, techniques, and linguistic analysis: The role of motivation, beliefs, and identity. In: Proceedings of the Plenary session at the 33rd International IATEFL Annual Conference; 28 March–1 April 1999; Edinburgh, Scotland.

Ramirez AG (1986). Language learning strategies used by adolescents studying French in New York schools. *Foreign Language Annals* 19(2): 131–138. doi: 10.1111/j.1944-9720.1986.tb03108.x

Ramos PR, Colchero EG, Calvo VB, Garcia FG (2022). Degraded beauty: Contextual art and landscape education through a project in secondary school. *ARTSEDUCA* (32): 107–120.

Sadeghi K, Abdi H (2015). Comparison of EFL teachers and students' beliefs about language learning. *MEXTESOL Journal* 39(1): 1–14.

Santos JC, Veiga V (2022). Tertiary ecuadorian students' beliefs about learning a foreign language: A descriptive study. *Journal of English Language Teaching and Applied Linguistic* 4(1): 22–29. doi: 10.32996/jeltal.2022.4.1.2

Shahsavar Z, Jafari P (2018). Examining gender differences in students' attitude toward blogs using measurement invariance. *The International Journal of Diversity in Education* 18(2): 13–25. doi: 10.18848/2327-0020/cgp/v18i01/13-25

Shahsavar Z, Kourepaz H (2020). Postgraduate students' difficulties in writing their theses literature review. *Cogent Education* 7(1): 1–11. doi: 10.1080/2331186x.2020.1784620

Siebert LL (2003). Student and teacher beliefs about language learning. *Foreign Language Annals* 33(4): 394–420.

Solikhah I, Budiharso T (2022). Linguistic landscape to improve quality of language learning and its relationship with blended learning, learning motivation and teacher competence. *Eurasian Journal of Applied Linguistics* 8(3): 55–69.

Stevick EW (1980). *Teaching languages: A Way and Ways.* Newbury House Publishers, Inc.

Thaba A, Baharuddin MR (2022). Influence of parental attention, self-concept, and independent learning on students' learning achievement in the Indonesian language subjects. *Eurasian Journal of Educational Research* 97(97): 103–113.

Tleubay ST, Zhauynshiyeva ZB, Yessimkulova SS, et al. (2023). The emotional intelligence development of future English language teachers. *International Journal of Innovative Research and Scientific Studies* 6(3): 667–681. doi: 10.53894/ijirss.v6i3.1742

Vibulphol J (2004). Beliefs about language learning and teaching approaches of pre-service EFL teachers in Thailand [Bachelor's thesis]. Oklahoma State University.

Wahsheh NA (2023). Language skills level among students with mental disabilities at Ajloun Governorate. *Nurture* 17(3): 368–377. doi: 10.55951/nurture.v17i3.354

Yang ND (1999). The relationship between EFL learners' beliefs and learning strategy use. *System* 27: 515–535.