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General Adaptation Scale for International Students: Development and Validation

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Abstract

Embracing a holistic and eclectic perspective, this study aims to develop and empirically test an instrument to assess international students' general adaptation to a host country. The data were obtained from a sample of international undergraduate students (n=843) studying at a Turkish state university using purposive sampling methods of maximum variation. The analyses were conducted in two consecutive phases with two different groups of international students. Upon a meticulous data clean-up and preliminary analyses for the assumptions of normality and reliability, exploratory factor analysis (EFA) to discover factor structure was utilized. In the second phase, confirmatory factor analysis (CFA) was performed through Lisrel to validate the scale structure revealed by EFA. After a rigorous and iterative scale development process, the results confirm the reliability of factors, model fit and construct validity of the General Adaptation Scale for International Students (GASIS). GASIS as a multi-dimensional instrument consists of 28 items using a five-point Likert scale with four factors labelled as academic adaptation, sociocultural adaptation, psychological adaptation, and daily life adaptation to assess international students'general adaptation levels. The final form of 28-item GASIS with psychometric features, as well as implications and limitations for future research are included in the study.

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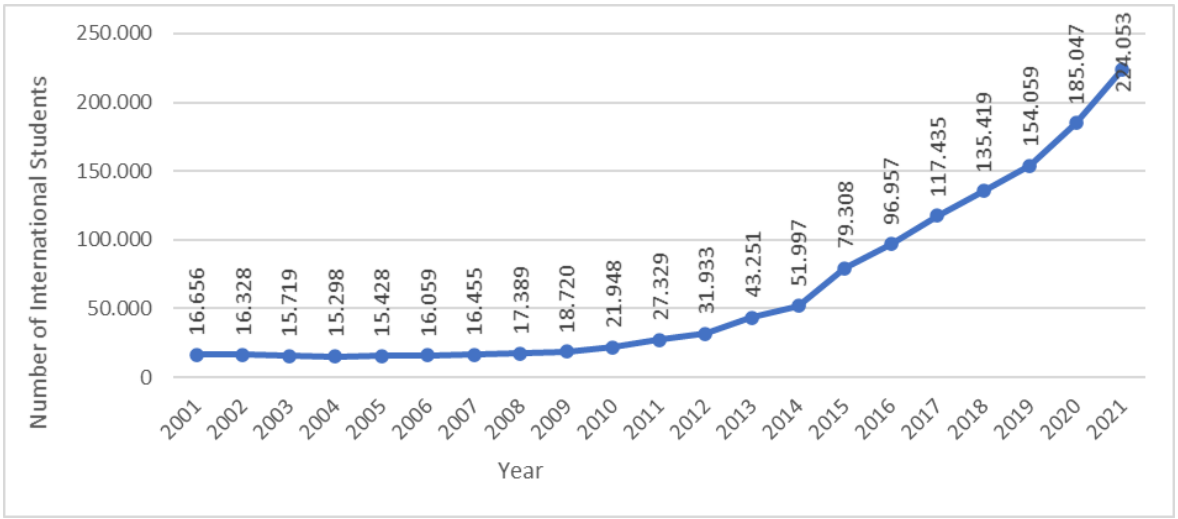
INTRODUCTION

The increasing importance of higher education (HE) has channeled national efforts for internationalization in higher education across the globe. De Wit and Altbach (2021) argue that a combination of political, economic, sociocultural, academic rationales and stakeholders is behind this global endeavor. Besides, internationalization has become a principal catalyst for change in higher education (de Wit, 2020) as it has fueled international student mobility across borders. Terry (2011) claims international students offer social, cultural, and economic benefits to host nations pursuing internationalization in higher education. Similarly, Shafaei and Razak (2016) posit that student mobility significantly impacts the host nation's economic, social, cultural, and academic growth. Thus, during the past fifty years, student mobility has doubled every other decade, and the projection for the next decade is 8 million globally mobile students (de Wit & Altbach, 2021). Undoubtedly, these developments could not be considered independently of facts such as globalization, international cooperations, and international treaties (Erişti, Polat, & Erdem, 2018).

Since the demand for a qualified workforce together with financial, academic and sociocultural benefits has whetted the appetite of many countries, student mobility has become the core component of internationalization in higher education. Considering the scale and volume of student mobility in the future, the global competition to attract more international students has escalated. Higher education institutions (HEIs), on the other hand, are torn between keeping their unique institutional practices in their national systems and moving toward a more homogeneous direction to compete globally (Kirloskar & Inamdar, 2021). Yet, nations have devised their own HE policies incorporating multiple strategic improvements into their HEIs to urge benefits from the process. Likewise, European Union (EU) has set a core goal for the European Higher Education Area to improve student mobility becoming a major policy priority of the EU's agenda for modernization in tertiary education (Barrioluengo & Flisi, 2017). Furthermore, China, Singapore, and Malaysia have emerged as new destinations for international students (Altbach & Engberg, 2014). Thus, de Wit and Altbach (2021) note that the global competition for international students has become more intense by pointing out the shift in the typical divide between sending and receiving countries. With this shift in recent years, Turkey stands out as a developing country, improving HE policies to become a favorable destination for international students (Erdem & Polat, 2019). The recent policies established to comply with the international educational standards have resulted in hosting an increasing number of international students (Seggie & Ergin, 2018). Given the number of international students in the last two decades released by the Turkish higher education council (CoHE) is noteworthy considering a constant increase.

Figure 1. *The number of international students in Turkish HEIs*



As evident in Figure 1, international students have been steadily increasing for decades. Seggie and Ergin (2018), therefore, point out "Erasmus+, Mevlana Exchange Program, Project-Based International Exchange Program and Job Guaranteed Scholarship Programs for International Students" are effective at witnessing the figures. Similarly, as of 2010, international agreements, partnerships and collaborations have played an essential role in this numerical increase, but policies for internationalization and legal regulations targeting the removal of bureaucratic obstacles have had a significant impact (Arslan, 2020). Besides all, with the outbreak of a raging war in Syria, millions of people had to flee to Turkey as the closest safe zone (Arslan & Kılınç, 2021). Since then, Turkey has been hosting more than 3.675,485 (Directorate General of Migration Management, [DCMM], 2021) Syrian asylum seekers, among whom there are 27034 active students enrolled in Turkish HEIs (Ministry of National Education [MoNE], 2020). Thus, every other year a growing number of Syrian students are expected to actively join the system (Özenç & Kara, 2021). Regarding the facts above, it's evident that a dynamic combination of factors has resulted in a steady rise in the number of international students in Turkey.

Since the number of international students in the Turkish HE system has grown in decades, the issue of adaptation of these students to the host country's culture and language and their new social environment and academic life has arisen. Accordingly, previous research has proven that although the study abroad experiences provide international students with opportunities to improve intercultural skills and broaden their horizons as well as bring out career options (Rienties, Luchoomun, & Tempelaar, 2013), adapting to a host cultural surrounding is a stressful and difficult process (Berry, 2005). Calling attention to this adaptation process, Li and Gasser (2005) posit that international students often encounter various adaptation problems. Zhou et al. (2008) underline that international students at HEIs experience many difficulties with the host country's culture and struggle with issues in their new educational setting and sociocultural environment. Likewise, Knight (2011) states those who participate in mobility programs generally feel marginalized, isolated, and lonely and confront racial tensions. They also suffer from stressful experiences, including homesickness, seeking accommodation, language barrier and struggling with their new educational setting (Sigalas, 2010). Spencer-Oatey and Xiong (2006) also reveal that sojourning students are more likely to have depression symptoms because of challenges and difficulties integrating with the host culture and adjusting to new routines in their daily life. Furthermore, Kılınç, Arslan and Polat (2020) report that common challenges international students often face can fit in a wide range of sociocultural, psychological, financial and academic issues. According to Molinsky (2007), however, assuming international students overcome various challenges they experience, they could successfully adapt to their new surroundings and avoid the negative impacts of norms and stereotypes. Additionally, international students' adaptation to the cultural milieu of the host country could lead to a number of outcomes facilitating both individuals, and the host society thrives and profit from internationalization in education (Shafaei & Razak, 2016). In this regard, devising new strategies to smoothen the cross-cultural transition by being aware of the general adaptation phase for international students has attained a primary status.

The notion of general adaptation of international students in higher education is multifaceted and includes various subsets based on the factors focusing on specific domains in the literature. Although there is no consensus on any structural model consisting of several components, studies have addressed similar aspects to conceptualize adaptation. Regarding the versatile conceptualization, acculturation, for example, which includes the problems, reactions and changes experienced by a person facing a new sociocultural environment, is an extensively studied topic in the HE literature on sojourning students (Bektaş et al., 2009). Acculturation, a broad concept, was initially defined by Redfield, Linton and Herskovits (1936) as a phenomenon referring to the ongoing changes in the cultural patterns belonging to the original culture of people from different cultural backgrounds. Later, Berry (1997), in his seminal work (Immigration, Acculturation, and Adaptation), redefines the term as

a two-dimensional process characterized by the tension between cultural maintenance of the native culture and contact and participation with the host culture. Based on these dimensions, Berry (2005) also explains that people choose between four main acculturation strategies: integration, assimilation, separation, and marginalization. Linking acculturation research with adaptation outcomes, Berry (2005) argues that the integration strategy is the most adaptive, whereas the marginalization strategy is the least adaptive. Therefore, in the case of international (sojourning) students, a distinct group from immigrants or refugees in character, integration strategy is proven the most adaptive one (Zheng, Sang & Wang, 2004). In line with the mentioned above, acculturation serves as an umbrella term as it is a very broad construct, including assimilation, separation and marginalization strategies and directly links with our conceptualization as international students often choose integration strategy in their adaptation process. Therefore, several studies report that international students face acculturative stressors in their new educational settings, including discrimination, language barriers, loneliness, homesickness, financial issues, daily life, and academic challenges (Nayir & Saridas, 2021; Smith & Khawaja, 2011; Wang & Mallinckrodt, 2006).

As for the general adaptation studies on international students, another significant and broad concept mainly derived from acculturation studies is cross-cultural adaptation. According to Searle and Ward (1990), cross-cultural adaptation consists of two separate but connected concepts: sociocultural adaptation and psychological adaptation. In the early studies, cross-cultural adaptation was thought of as a notion that includes two sub-dimensions labelled as "psychological" comprised of emotional and affective subset and "sociocultural", representing the behavioral aspect. Still, later Ward (1996) proposed that psychological and sociocultural factors are distinct domains and refer to particular characteristics. Similarly, some researchers also posit that psychological adaptation represents a number of psychological features consisting of various key factors such as individuals' traits related to their internal sense of identity composed of cultural and personal aspects, personality variables, healthy mental and physical well-being, or feeling of motivation and satisfaction in a new social environment (Schmitz, 1992; Searle & Ward, 1990). Yet, sociocultural adaptation is more directly tied to the social skill capacity of individuals (Ward & Kennedy, 1993) to manage daily challenges especially related to family, work or academic life and connect themselves to their new sociocultural environment (Berry, 1997). In short, even if psychological adaptation and sociocultural adaptation have been proven to be linked in empirical studies, there are still both conceptual and empirical reasons to distinguish them (Berry, 1997). Hence, the former is more likely associated with a person's state of well-being, motivation, anxiety, stress and so on, whereas the latter one is about the cognitive and behavioral aspect of individuals affected by the host country's culture and the acquisition level of social skills of a person to survive daily life in a new environment.

Given the importance of cross-cultural adaptation for international students, extensive efforts have been made to shed light on the factors effective in this process (Ward et al., 2001; Zhou et al., 2008). The first attempts to examine social and psychological problems of international students started in USA and Britain in the 1950s (Ward et al., 2001). Along the way, a number of models, originated first in the studies on culture and culture shock (e.g., Gullahorn & Gullahorn, 1963; Lysgaard, 1955; Oberg, 1960), yet later incorporated into acculturation and cross-cultural adaptation studies (e.g., Searle & Ward, 1990; Berry, 1997; Kim, 2001), have been proposed to reveal the mechanism and factors behind the complex adaptation process in a framework. While traditional viewpoint towards this process was based on clinical and medical studies, most of which was dominated by psychologists (e.g., Bowlby, 1969; Holmes & Rahe, 1967) until the 1980s, contemporary literature investigates and discusses the subject from multiple perspectives. Therefore, researchers have investigated this adaptation process in various contexts. Li and Gasser (2005), for instance, focus mainly on the connections between international students' contact with host society, their ethnic identification, cross-cultural self-efficacy, and their sociocultural adaptation. While Sumer et al. (2008), and Lee and Çiftci (2014) look into the role of social support, Swami (2009), puts emphasis on the discrimination

and cultural distance. However, Vedder and Virta (2005) explore the effects of native and host language proficiency and ethnic identity on sociocultural and psychological adaptation.

In line with the above mentioned, various factors have been proven to be antecedents in the adaptation process for international students. Language proficiency, for example, is regarded as another key predictor of the psychological and socio-cultural adaptation of international students (Kwon, 2013; Wang & Hannes, 2013; Zhang & Goodson, 2011). The positive effects of social support from family members and local or non-local friends on the adaptation process have also been documented (Hendrickson et al., 2011; Kashima & Loh, 2006). From a broader perspective, Hirai, Frazier, and Syed (2015), in their study on psychological and sociocultural adjustment of first-year international students, demonstrate that language-related factors, academic stress, personality and social relationships are significant factors. Besides, cultural awareness and intercultural communication are regarded as necessary components of social adaptation in a new environment (Dai & Zhao, 2021). Therefore, a combination of factors underlying the adaptation level of individuals is deemed related to international students undergoing a rigorous adaptation process and vulnerable to unexpected changes.

Consequently, as evident above, considerable effort has been devoted to understanding international students' general adaptation, and the literature is extensive and theoretically diverse. According to Hammer (1992), the literature on international students commonly covers four areas: problems they face, psychological reactions to a new cultural environment, the influence of social interaction and communication on their adaptation, and the cross-cultural culture learning process. Kagan and Cohen (1990) have also noted that the majority of research on sojourning students has focused on the emotional, behavioral, and cognitive effects of cross-cultural transition, intending to determine whether individual, interpersonal, social, structural, and economic elements consistently predict adaptation. Ward, Bochner and Furnham (2001, p.161) adopt a broad perspective and suggest that “salient themes in research specific to sojourning students include interpersonal and intergroup interactions; the difficulties faced by international students; academic issues in the intercultural classroom; temporal variations in psychological, sociocultural and academic adaptation”.

Consistent with the theories and models in the literature, various instruments have been developed to provide empirical proof. Sociocultural Adaptation Scale (SCAS), for instance, was developed by Searle & Ward (1990) based on the previous studies by Trower, Bryant and Argyle (1978) on social skills and the research by Furnham and Bochner (1982) on social situations. Originally, SCAS composed of 16 items is regarded as an instrument focusing only on intercultural competence, but a revised version of the scale (SCAS-R) developed by Wilson (2013) composed of 21 items and has also explored the cognitive domain, including five factors: interpersonal communication, academic/work performance, personal interests and community involvement, ecological adaptation, and language proficiency. Another tool designed to assess adjustment problems of international students is the Acculturative Stress Scale for International Students [ASSIS] by Sandhu and Asrabadi (1998). The scale consists of 36 items scored on a five-point Likert-type scale with a six-factor structure, ranging from perceived discrimination, homesickness, perceived hate, fear, stress due to change/culture shock and guilt. However, the researchers included a “miscellaneous” part that contributed to unexplained variance but could not be categorized under any one specific factor. They have stated that they believe the items are important enough to be included in this scale to measure international students' acculturative stress as a whole. The Intercultural Adjustment Self-Efficacy [IASE] (Brenner, 2001) is another instrument to measure international students’ beliefs in their abilities to do certain things effectively while on a study abroad program in a foreign country. The IASE consists of 27 items using a ten-point Likert scale with eight factors labelled as acculturate, personal care, logistics of the country, emergency management, interpersonal abilities, psychological strengths, cultural justification and educational adaptation. In addition to all scales mentioned, the Mental Health Inventory [MHI-5] (Davies, Sherbourne, Peterson, & Ware, 1988) is another tool to measure sojourners’ level of

psychological adjustment. This instrument is a five-item scale using a six-point Likert form that assesses psychological adjustment by addressing areas such as behavioral dysfunction, psychological distress, and general positive affect. Academic Adjustment Scale [AAS] developed by Anderson, Guan and Koc (2016) is another instrument to measure one of the dimensions of international students' adaptation. Nine items are grouped under three factors named "academic lifestyle", "academic achievement", and "academic motivation" in this scale. Karakuş and Akay (2020) developed Scale of International Students to Higher Education [SISHE]. The instrument consisting of 21 items is based on four factors called "the process of academic courses", "academic principles", "academic life (experiences)" and "socio-cultural life at university". As can be seen in that scale, while 16 of the items under three of the factors directly related to academic adaptation, only five items represent the socio-cultural aspect of the adaptation process. Another instrument for sociocultural adaptation developed by Bikos, Forman and Patton (2020), was originally designed to be used in evaluating and enhancing programs such as international education, yet it may also be useful for use with international students after further evaluation. Unlike the previous instruments The Self-Efficacy for Sociocultural Adaptation Scale [SESCAS] was developed for self-efficacy for three types of tasks (affective, behavioral, cognitive) in two cultural contexts (environmental, interpersonal).

Employing a holistic and eclectic perspective, this research aims to develop an original, reliable, and valid instrument to determine the general adaptation levels of international students in higher education. In this context, the following research questions are addressed:

1- Is GASIS a valid measurement instrument to assess the general adaptation level of international HE students?
2- Is GASIS a reliable measurement instrument to assess the general adaptation level of international HE students?

METHOD

After a comprehensive literature review on the scale development and construct clarification procedures explained and suggested by different researchers in the literature (e.g., Cohen, Swerdlik, 2018; DeVellis, 2017; Erişti & Erdem, 2017; Sağlam & Arslan, 2018), the researchers developed a comprehensive and sequential approach in the development of the draft scale based on the set of specific guidelines clearly defined in the literature. The validity and reliability levels of the draft were tested through two consecutive phases conducted on two different groups of international students. The steps grouped under five stages and described thoroughly in the next section are as follows:

A) Conceptualization
- A.1 Answering some preliminary questions before the scale development
- A.2 Doing an extensive literature review

B) Construction
- B.1 Creating a sizable pool of items
- B.2 Revision of the items
- B.3 Formatting the items and the response anchors
- B.4 Operationalizing the draft scale
- B.5 Consulting expert opinion

C) Tryout
- C.1 Pilot study
- C.2 Revision

D) Implementation (Two phases)
- D.1 Administration of the draft scale on the first sample group
- D.2 Item analysis
  - D.2.1. Preliminary analysis for exploratory factor analysis (EFA)

D.2.2. EFA
D.2.3. Reliability analysis
D.4 Administration of the draft scale on the second sample group
D.5. Item Analysis
D.5.1. Preliminary analysis for confirmatory factor analysis (CFA)
D.5.2. CFA
D.5.3. Reliability analysis

E) Finalizing the draft scale

THE DEVELOPMENT PROCESS OF GASIS

First of all, the researchers organized an online meeting to find answers to some preliminary questions they encountered in the conceptualization stage of the scale. Although these questions look simple at first glance, they are practically valuable to clarify the next steps. By answering these questions, closely associated with the purpose and the theoretical framework of the scale, the plan and the procedures were defined clearly. Some of the preliminary questions in this stage are as follows:

1- What's the purpose of this measurement tool?
2- Is this measurement tool required in the literature?
3- Are there any similar measurement tools in the literature?
4- Is the scope of this measurement tool different from the previous ones?
5- Who does this measurement tool address?
6- What is the ideal response format for this measurement tool?

In the second step, a comprehensive literature review was conducted to shed light on the notion of the general adaptation of international students. Theoretical studies, research findings and similar scale development studies were the primary sources used extensively in this process. As a result of the literature review, the variables related to the adaptation process of international students are listed in groups. The results of this study helped draw the borders of the theoretical background, which form the conceptual framework distinctly and reveal the potential dimensions in accordance with the purpose of the instrument.

After that, an item pool composed of 64 items grouped under five dimensions defined based on the theoretical frame reached through the extensive literature review (e.g., Berry, 1997; Gullahorn & Gullahorn, 1963; Kim, 2001; Lysgaard, 1955; Oberg, 1960; Searle & Ward, 1990) was generated. The researchers then had an online meeting to revise the clarity and comprehensibility of the items. This step was also required to eliminate or merge overlapping the items that focused on the same or very comparable points under the same factor. At the end of the revision, the number of items decreased to 47.

In the following step, a five-point likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), was chosen. The items and response anchors were formatted accordingly. The instrument was then operationalized before sending to a group of experts for review. In this step, the draft scale was formed consisting of three sections: a) instruction part, b) demographic information form, and c) draft form of GASIS. The instruction section informs participants about the purpose of the research and provides a response guideline with descriptive information, including the number of items, average response time, and the researchers' identities. The demographic information form consisted of four questions aiming to determine the participants' gender, nationality, duration of stay in the host country and the level of the host language. Finally, the GASIS draft form composed of 47 items to determine the general adaptation levels of international students was attached in the third part.

In the last part of the second stage, called construction, two field expert groups were identified. For the content and face validity of the scale, the first group consisted of field experts specializing in internationalization of higher education, international student adaptation, psychology, and

assessment and evaluation studies in education. Eight of the 15 experts we were invited to examine the scale sent their opinions on the items by e-mail. According to their suggestions, nine items were omitted from the draft scale, and the number of items was reduced to 38. Complying with the feedback and corrections from the experts, researchers utilized the Miles and Huberman formula *(Reliability = consensus /consensus + disagreement)* to assure the reliability of the consensus and disagreement ratio among experts and 87.5% consensus has been reached (Miles & Huberman, 1994). Also, thirteen of the items were revised and rewritten by the feedback from the field experts. After the first groups' feedback, ten scholars in the second group from English language teaching department and three native English speakers were invited to consult on the clarity and comprehension check for the items. Six experts and two native speakers sent their feedback on the spelling, punctuation, and wording. Finally, problematic, ambiguous, and unclear items were corrected according to the suggestions, and the final form of the draft scale was generated. Agreement rate among the experts in the second group was 99%, only one of the experts insisted on to delete one ambiguous phrase.

The third stage, called tryout, includes two steps: pilot study and revision. Researchers randomly selected 50 international students to take the scale in its draft form in order to assess the clarity and intelligibility of the instructions, items, and response anchors. The pilot study was conducted at classrooms under the supervision of the researchers, and students were instructed to highlight or circle the words and phrases that were ambiguous. They were also encouraged to ask any questions about the scale in this process. After the papers were collected, each of them was analyzed carefully to find out the problematic parts. Only 11 students indicated nine different words as incomprehensible. Based on the feedback no items were omitted, but nine of them were revised, and the ambiguous words were replaced with basic synonyms.

The implementation stage, one of the critical milestones in the development process, included the administration of the draft scale, item analyses and revision studies. This stage involved two phases conducted on two different groups of participants.

THE FIRST PHASE

PARTICIPANTS

Data of the first phase for the EFA were collected from the first group of international students studying at a state university in Turkey that welcomes over 11,000 international students from 90 countries (Karabuk University [KBU], 2022). At first, utilizing purposive sampling methods of maximum variation (Patton, 2015), the sample size (N=410) was determined based on the number of items in the draft scale and the criteria highlighted in the literature (Field, 2009). Then, researchers briefed the participants about the research in the classes and invited them to participate in the study. Of 410 international students, 340 equals a response rate of almost 83% accepted to participate. As a result of the preliminary check on the dataset, 24 forms were removed from the dataset because they were incomplete or not responded appropriately, and researchers determined to perform the analysis with the dataset obtained from a total of 316 students, which is fairly acceptable for EFA analysis in the literature (Comrey & Lee, 2013; Field, 2013; Tabachnick & Fidell, 2018). All demographic information of the volunteer participants is presented in Table 1.

Table 1. *Demographics of the participants in the first phase.*

		N	*%*
Gender	Male	250	79,1
	Female	66	20,9
	Total	316	100,0
Country	Somalia	56	17,7
	Syria	53	16,8
	Chad	47	15
	Sudan	23	7,3
	Pakistan	20	6,3
	Yemen	19	6,0
	Palestine	*18*	*5,7*
	Rep. of the Congo	15	4,7
	D. Rep. of the Congo	10	3,2
	Senegal	10	3,2
	Afghanistan	9	2,8
	Jordan	9	2,8
	Azerbaijan	8	2,5
	Morocco	7	2,2
	Kazakhstan	6	1,9
	Mauritania	6	1,9
	Total (16 countries)	316	100
Duration of stay in the host country	24 or more months	165	13,6
	13-24 months	61	14,6
	7-12 Months	46	19,6
	0-6 months	44	52,2
	Total	316	100,0
Level of the host language	C1	130	8
	B1	48	9,2
	C2	45	15,5
	B2	39	12,3
	A2	29	40,8
	A1	25	14,2
	Total	*316*	*100*

PROCEDURES

Researchers applied for The Ethical Review Committee of the institution and received the approval before data collection. After that, the data collection process was completed in one week. The researchers collected data in person. At the beginning of the administration, researchers informed the students about the purpose of the study, and only volunteers completed the scale. At the end of the administration on the first group, the sheets were collected and checked before the initial analysis. When the papers were checked researchers eliminated 24 incomplete papers from the analysis as mentioned above.

DATA ANALYSIS

After entering the data into SPSS, preliminary analysis for EFA was conducted. The normality of the data was checked by visual methods using stem and leaf plot, histogram and Q-Q plot (e.g. McKillup, 2011); descriptive statistics such as mean, mode, median, skewness and kurtosis values (e.g. Kirk, 2008) and mathematical methods by Kolmogorov-Smirnov and Shapiro Wilks tests (e.g. Abbott, 2011). When the results obtained in the context of normality were evaluated holistically, it was clearly seen that the data were normally distributed. Then, the differences between mean scores of upper 27% and lower 27% was explored, item-total correlation values, Kaiser-Meyer-Olkin Measure of Sample

Adequacy (KMO) and Bartlett's Test of Sphericity were checked prior to the EFA, and it was determined that the dataset was acceptable for the analysis. The following section delves into the findings in further depth.

THE SECOND PHASE

PARTICIPANTS

Data for the second phase, including confirmed factors pattern after the EFA in the first phase, were obtained from another group of international students at the same institution. A very similar approach to the initial phase was followed in this phase, and a total of 600 students who did not participate in the previous phase were selected through the same sampling methods. At this time, a total of 527 international students from 47 countries representing a response rate of almost 87,83% responded the scale. Participant demographics are summarized in Table 2.

Table 2. *Demographics of the participants in the second phase.*

		N	*%*
Gender	Female	122	23,1
	Male	405	76,9
	Total	*527*	*100,0*
Country	Syria	60	11,4
	Somalia	56	10,6
	Chad	52	9,9
	Kazakhstan	34	6,5
	Sudan	28	5,3
	Turkmenistan	26	4,9
	Pakistan	24	4,6
	Yemen	24	4,6
	Morocco	22	4,2
	Palestine	22	4,2
	Senegal	22	4,2
	Afghanistan	15	2,8
	Rep. of the Congo	15	2,8
	Jordan	11	2,1
	D. Rep. of the Congo	10	1,9
	Egypt	9	1,7
	Mauritania	9	1,7
	Myanmar	9	1,7
	Uzbekistan	9	1,7
	Gabon	7	1,3
	Others (27 Countries)	63	11,9
	Total (47 Countries)	*527*	*100*
Duration of stay in the host country	0-6 months	107	20,3
	7-12 months	128	24,3
	13-24 months	81	15,4
	More than 25 months	211	40,0
	Total	*527*	*100,0*
Level of the host language	A1	29	5,5
	A2	34	6,5
	B1	55	10,4
	B2	150	28,5
	C1	192	36,4
	C2	67	12,7
	Total	*527*	*100*

PROCEDURES

A total of 527 international students volunteered in the second phase. A very similar procedure was followed in the administration of the draft form in the second phase. The data collection process, which was carried out in the classrooms by the researchers, was completed in ten days. As a result of the preliminary investigation of the dataset, none of the forms was eliminated from the dataset due to the inappropriate responses. Researchers decided to conduct the analysis with the data gathered from a total of 527 students.

DATA ANALYSIS

Just like before the EFA in the first phase, some preliminary analyses were performed. At first, visual, descriptive and mathematical methods were used to check the normality of the data. As the second step, the differences between mean scores of upper 27% and lower 27%, item-total correlation values were calculated. Finally, Kaiser-Meyer-Olkin and Bartlett sphericity test were conducted and reported that the dataset was appropriate for the CFA. After that, discriminant validity, convergent validity, and reliability analyses were completed. The results of the analyses are explained in detail in the following section. At the end of the second phase, the scale development process was finalized, and the findings were reported.

FINDINGS

This section involves the validity and reliability analysis results conducted in two phases on two different groups of participants.

THE FIRST PHASE

As mentioned above, researchers checked a number of statistics and plots before EFA. According to the descriptive statistics (see Table 3), mean, median and mode are fairly close to each other, and similar skewness and kurtosis values are between the acceptable thresholds (Bryne, 2010; George & Mallery, 2010; Hair et al., 2010).

Table 3. *Statistics for normality before EFA*

N	Valid	316
	Missing	0
Mean		3,62
Median		3,63
Mode		3,53
Std. Deviation		,501
Skewness		-,300
Std. Error of Skewness		,137
Kurtosis		,384
Std. Error of Kurtosis		,273

Next, both tests of normality, provide significance values that confirm the assumption of normality for the data (given in Table 4).

Table 4. *Tests of normality before EFA*

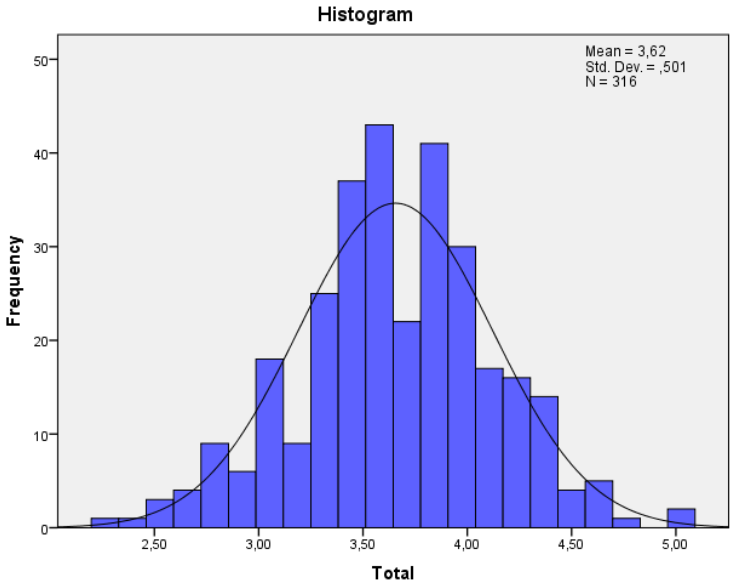
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Total	,046	316	,200*	,995	316	,418

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Finally, the histogram (given in Figure 2) clearly validates the data's normality (Field, 2013; McKillup, 2011; Thode, 2002).

Figure 2. *Histogram before EFA*



In the next step, researchers conducted an independent t-test to see the differences between mean scores of upper 27% (n=85) and lower 27% (n=85). In this regard, the items were sorted descending and 27% upper and lower groups of participants were identified through a basic percentage calculation. Then these participants were coded as 1 and 2, representing their group, and an independent t-test was performed. The findings revealed a significant difference between the means of the upper (M= 4,17 SD=0,25) and lower group (M= 3,01 SD=0,33). Thus, the results showed that the items were adequately distinctive [t (168) =25.475, p<.01].

After that, item discrimination was calculated through reliability analysis and item-total correlation values were investigated. The literature (Field, 2013) highlights that none of the items should be below 0.30 value. According to the results (see Table 5), all of the reported values in the draft scale form were over the threshold.

As a final step before the EFA, KMO test which measures sampling adequacy of the data for factor analysis and Barlett sphericity test that verifies whether a correlation matrix is significantly different from an identity matrix (Bartlett, 1951) were conducted. KMO values ≥.70 are desirable (e.g., Lloret et al., 2017), and the values less than .50 are considered problematic (e.g., Child, 2006). As a result of the analysis, the calculated KMO value is .867. This value is at a level that is considered meritorious (Kaiser, 1974) and means that the correlation structures are integrated, and factor analysis will present reliable factors (Pallant, 2001). Besides, the results of the Barlett sphericity test also reveal that the obtained chi-square value is significant (X2(703) =4691,710; p<.001). Based on the results obtained from the initial analyses before EFA, it was concluded that the research data were suitable for the factor analysis and showed a multivariate normal distribution.

In order to reveal the factor pattern of the scale, “principal component analysis” was chosen as the extraction method and "varimax”, which is a statistical method for clarifying the relations among the factors by maximizing the variance shared among items and simplifying item loadings (Allen, 2017), was selected as the rotation technique, and the EFA was conducted using IBM SPSS Statistics 24.

As a result of the first analysis, it was observed that there were four components with eigenvalues above 1 for a total of 28 items in the draft scale form. However, at this first stage, the presence of items with low factor loadings and overlapping items were remarkable. In removing problematic items from the scale structure, many criteria were considered simultaneously. When the overlapping status of the scale items and their ability to meet the acceptable level of factor load values

were evaluated, it was found that four items were below the .40 acceptance value (2, 18, 21, 31); and five items were overlapping (1, 3, 9, 19, 29, 30). After the items in question were excluded from the analysis one by one, EFA was repeated each time, and the factor structure was checked continuously. After removing 9 items, it was observed that all of the items in the scale were grouped under four dimensions (see Fig. 3 & Table 5), in a structure that diverged from each other, and the correlation values varied between at least .318 and .545, which is considered ideal (Pallant, 2001). The four factors were named as academic adaptation (ACA), socio-cultural adaptation (SCA), psychological adaptation (PSA) and daily life adaptation (DLA) (see Table 5).

The total variance explained by the four-factor structure obtained after removing the items from the scale is 50.16%. The first factor consisting of 8 items (27, 26, 22, 20, 28, 24, 23, 25) was 24.15%; the second factor consisting of seven items (33, 34, 38, 36, 35, 32, 37) contributed 12.05%; the third factor consisting of six items (6, 5, 4, 7, 8, 10) contributed 7.76%; and the fourth factor consisting of seven items (16, 11, 15, 12, 17, 13, 14) contributed 6.19% to the total variance. In multifactorial designs, factors explaining 30% to 40% of total variance are considered problematic (Tinsley & Tinsley, 1987) and 50% is considered sufficient explained variance in the literature (etc. Mooi & Sarstedt, 2010; Shrestha, 2021; Streiner, 1994).

Comrey and Lee (1992) offered a guideline for the quality of factor loadings of the items in factor analysis. According to this reference point, .71 and above is excellent, .63 is very good, .55 is good, .45 is fair, and .32 is poor. Likewise, Tabachnick and Fidell (2018) highlighted that the minimum factor load of an item should not be less than .32. In this context, six items are "excellent"; seventeen items are “very good”, and five items are “good”. In addition, the highest item load in the scale was calculated as .77; the lowest item load is .56. The structure of the factors after EFA, means and standard deviations of the items, item-total correlation statistics, component and rotation loadings are presented in Table 5.

After the EFA, the reliability level of the scale, which consists of a total of 28 items, was examined by analyzing the internal consistency coefficient. In the context of the scale total, the Cronbach Alpha coefficient is .881. When the factors were analyzed in terms of reliability, the values were reported as .858 for the 1st factor, .833 for the 2nd factor, .663 for the 3rd factor and .726 for the 4th factor (see Table 4).

Figure 3. *Scree plot of the exploratory factor analysis*

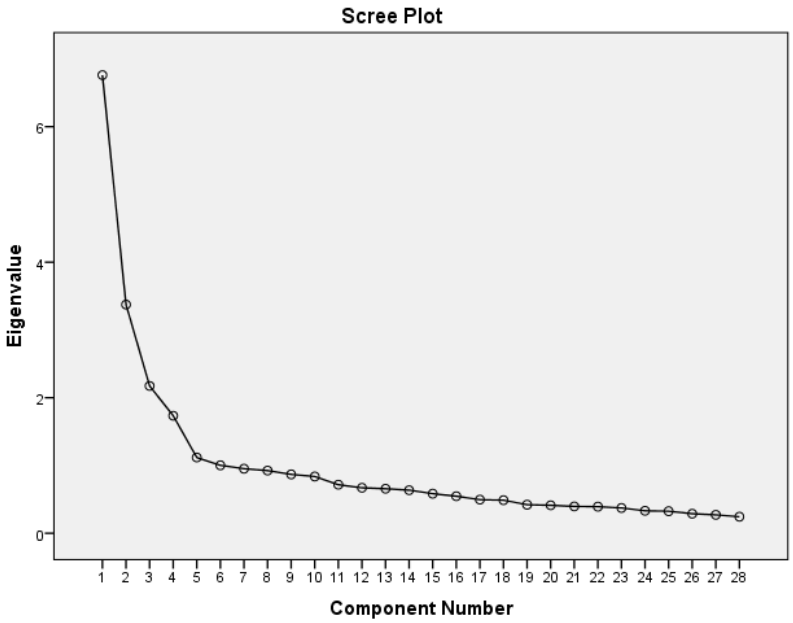
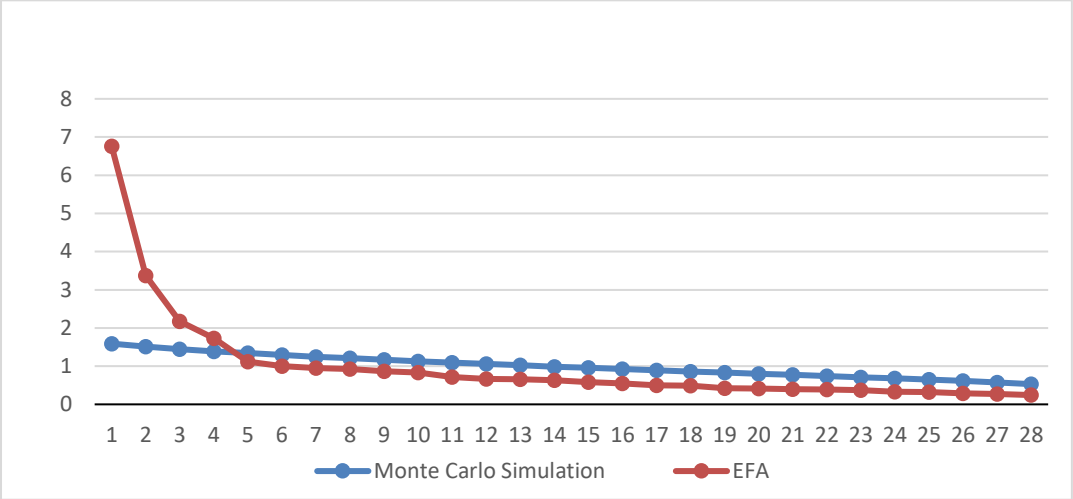


Table 5. *Statistics after EFA*

	Factors & items	Mean	SD	Item total r	Component factor load	Varimax factor load
1st Factor: Psychological Adaptation (α = 0.858)						
27	I want to give up everything because I feel lost here.	3,66	1,266	.493	,607	,749
26	I don't know how to cope with my anxieties.	3,42	1,131	.444	,570	,741
22	I feel lonely in a social environment.	3,20	1,276	.401	,571	,687
20	I feel like I don't fit in this country.	3,15	1,240	.367	,530	,679
28	I feel burned out here.	3,39	1,215	.545	,557	,679
24	Talking with locals makes me anxious.	3,32	1,212	.349	,479	,676
23	I feel powerless in this country.	3,13	1,298	.474	,504	,675
25	When I wake up, I don't feel motivated for a new day.	3,26	1,291	.464	,541	,659
2nd Factor: Daily life Adaptation (α = 0.833)						
33	I know how to travel here.	3,97	,856	.454	,546	,770
34	I know where to buy basic supplies.	4,02	,891	.428	,528	,745
38	I can deal with everyday problems.	3,87	,895	.461	,548	,695
36	I'm getting used to my new lifestyle in this country.	3,96	,779	.521	,609	,679
35	I know what to do in a state of emergency.	3,70	1,054	.421	,521	,670
32	I know the basic legal regulations of this country.	3,60	,988	.378	,472	,584
37	I know how to survive on my budget in this country.	3,78	,957	.435	,531	,571
3rd Factor: Academic Adaptation (α = 0.663)						
6	My teachers provide the necessary support when I need.	3,74	1,091	.505	,577	,725
5	I am satisfied with my academic progress.	3,66	,990	.474	,533	,720
4	I feel supported by my university.	3,29	1,148	.435	,505	,695
7	When I need help, my classmates are there for me.	3,71	1,010	.504	,578	,647
8	I am comfortable with the teaching styles of my new teachers.	3,73	1,036	.417	,468	,635
10	I collaborate with my classmates on school projects.	3,63	,959	.391	,454	,602
4th Factor: Socio-Cultural Adaptation (α = 0.726)						
16	I am aware of culturally accepted manners in the host country.	3,93	,899	.346	,421	,701
11	I am aware of national days and religious festivals of the host country.	3,63	1,072	.402	,476	,641
15	I respect the values and cultural norms of the host country.	4,33	,796	.348	,420	,626
12	I enjoy the local food of the host country.	3,79	,954	.402	,470	,620
17	I believe that I have integrated myself into the host culture.	3,73	,926	.512	,597	,616
13	I love the local music of the host country.	3,71	1,029	.400	,465	,570
14	I understand and tolerate jokes and humor.	3,74	,981	.318	,389	,565

After EFA, researchers performed Monte Carlo PCA for Parallel Analysis (MCPA) to analyze the construction of factors and to determine the number of factors to retain. As shown in Figure 4, the MCPA confirms the accuracy of the scree plot revealed in EFA. The intercepted section in the figure 4 proves that the scale consists of 4-factor structure.

Figure 4. Monte Carlo PCA for Parallel Analysis



THE SECOND PHASE

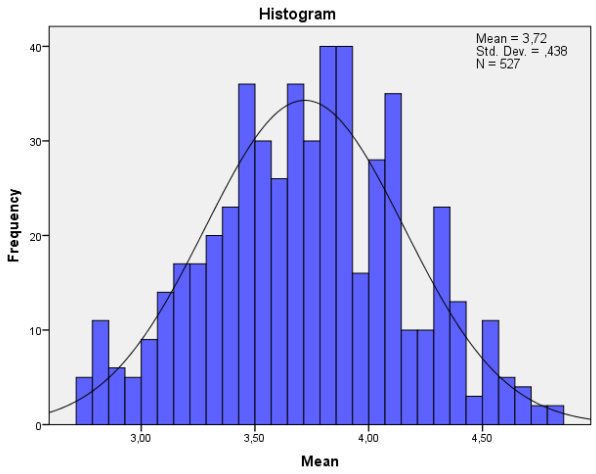
Before the Confirmatory Factor Analysis (CFA), the data set was checked for outliers and missing values. For normality parameters, the mode, median, and mean of the data were close to each other, the skewness and kurtosis were in the range of +1, -1 (See Table 6), z-standard scores were between +3, -3 (Bryne, 2010; George & Mallery, 2010; Hair et al., 2010).

Table 6. *Statistics for normality before EFA*

N	Valid	527
	Missing	0
Mean		3,72
Median		3,71
Mode		3,93
Std. Deviation		,438
Skewness		,003
Std. Error of Skewness		,106
Kurtosis		-,452
Std. Error of Kurtosis		,212

Next, the histogram (given in Figure 5) clearly shows the normality of the data (Field, 2013; McKillup, 2011; Thode, 2002).

Figure 5. *Histogram before CFA*



Finally, both normality tests (given in Table 7), which are often employed in the literature to determine how much the data deviate from the normal distribution, provide significance values that validate the normality for the data.

Table 7. *Tests of normality before CFA*

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Mean	,039	527	,054	,993	527	,018

a. Lilliefors Significance Correction

In the next step, researchers conducted an independent t-test to see the differences between mean scores of upper 27% (n=142) and lower 27% (n=142). The findings revealed a significant difference between the means of the upper (M= 4,26 SD=0,20) and lower group (M= 3,18 SD=0,19). Thus, the results showed that the items were adequately distinctive [t (281) =44.886, p<.01].

After that, item discrimination was calculated through reliability analysis and investigated item-total correlation values. After that, item discrimination was calculated through reliability analysis and investigated item-total correlation values. The literature (Field, 2013) highlights that none of the items should be below 0.30. According to the results (see Table 9), all of the reported values regarding the items in the draft scale were over the threshold.

Finally, before performing CFA, the Kaiser-Meyer-Olkin (KMO=.83) coefficient was examined and the Barlett sphericity test (3877.624, p <.001) was calculated to determine the suitability of the data. According to the preliminary analysis and calculations, the data were found to be suitable for performing CFA. CFA was performed for the 28-item scale in order to evaluate the factor construct validity. The values for the model data fit obtained are given in Table 8. According to the CFA, it was found that the t-values were above 2.56 and significant (p<.01), which is regarded as acceptable in the literature.

In terms of fit indices, the model demonstrates excellent fit according to model chi-square and degrees of freedom ratio; good fit according to RMSEA, SRMR, GFI and NNFI values; acceptable fit according to AGFI, CFI, NFI values. Also, when the modification index values of the model were examined in detail, it was observed that there was a remarkable relationship between the error covariances of especially two items (I25-I26) under the same latent variable. The analysis program (Lisrel 8.51) suggested a modification that there would be a significant decrease in chi-square value and increase in fit indices if two of the items (I25 & I26) were co-varied (given in Figure 6). Therefore, two observed items within the same latent factor (Psychological adaptation factor) were covaried as suggested by the program. When the fit indices after modification are examined, it can be said that besides an improvement in the degree of χ^2/df and fit indices (given in Table 8).

Table 8. *CFA Results*

CFA Results (n=527)				
	Before Modification χ^2 = 858,77; df = 344 (p <0.0001)		After Modification χ^2 = 815,36; df = 343 (p <0.0001)	
Fit Indices	Observed Values	Acceptable Values	Observed Values	Acceptable Values
χ^2/sd	2.49	Excellent Fit χ^2/sd ≤ 2.5	2.37	Excellent Fit χ^2/sd ≤ 2.5
RMSEA	0.053	Good Fit RMSEA ≤ 0.08	0.051	Good Fit RMSEA ≤ 0.08
S RMR	0.053	Good Fit S RMR ≤ 0.08	0.053	Good Fit S RMR ≤ 0.08
GFI	0.90	Good Fit GFI ≥ 0.90	0.90	Good Fit GFI ≥ 0.90
AGFI	0.88	Acceptable Fit 0.85≤ AGFI < 0.90	0.88	Acceptable Fit 0.85≤ AGFI < 0.90
CFI	0.93	Acceptable Fit CFI ≥ 0.90	0.93	Acceptable Fit CFI ≥ 0.90
NFI	0.89	Acceptable Fit NFI ≥ 0.85	0.89	Acceptable Fit NFI ≥ 0.85
NNFI	0.92	Good Fit NNFI ≥ 0.90	0.93	Good Fit NNFI ≥ 0.90
IFI	0.93	Good Fit NNFI ≥ 0.90	0.93	Good Fit NNFI ≥ 0.90

Sources: Schumacher & Lomax (2004); Jöreskog & Sörbon (1993); Kline (2011); Schermelleh-Engel, Moosbrugger & Müller (2003)

After CFA, the factor loads of the items were examined. The factor loads varied between the lowest 0.42 and the highest 0.71 for the ACA dimension; between the lowest 0.42 and the highest 0.58 for the SCA dimension; between the lowest 0.55 and the highest 0.66 for the PSA dimension; between the lowest 0.44 and the highest 0.69 for the DLA dimension (see Table 9). They are moderate and statistically significant, indicating convergent validity.

Table 9. *Statistics after CFA*

	Factors & Items	Mean	SD	Item total r	Factor loads	Error Variances	t values
1st Factor: Academic Adaptation (α = 0.751)							
4	I feel supported by my university.	3,42	1,086	,483	0.54	0.71	11.84
5	I am satisfied with my academic progress.	3,76	,903	,505	0.57	0.68	12.51
6	My teachers provide the necessary support when I need.	3,93	1,015	,566	0.71	0.49	16.52
7	When I need help, my classmates are there for me.	3,81	,968	,545	0.69	0.53	15.72
8	I am comfortable with the teaching styles of my new teachers.	3,91	,933	,477	0.54	0.71	11.80
10	I collaborate with my classmates on school projects.	3,74	,922	,370	0.42	0.82	8.91
2nd Factor: Socio-Cultural Adaptation (α = 0.717)							
11	I am aware of national days and religious festivals of the host country.	3,76	1,009	,444	0.55	0.70	11.88
12	I enjoy the local food of the host country.	3,80	,949	,452	0.53	0.72	11.24
13	I love the local music of the host country.	3,80	,985	,413	0.49	0.76	10.40
14	I understand and tolerate jokes and humor.	3,79	,934	,360	0.42	0.82	8.72
15	I respect the values and cultural norms of the host country.	4,32	,768	,425	0.51	0.74	10.76
16	I am aware of culturally accepted manners in the host country.	3,95	,828	,475	0.58	0.67	12.52
17	I believe that I have integrated myself into the host culture.	3,75	,870	,437	0.56	0.69	11.98
3rd Factor: Psychological Adaptation (α = 0.817)							
20	I feel like I don't fit in this country.	3,24	1,215	,517	0.58	0.67	13.04
22	I feel lonely in a social environment.	3,34	1,208	,542	0.60	0.64	13.76
23	I feel powerless in this country.	3,34	1,221	,499	0.56	0.69	12.63
24	Talking with locals makes me anxious.	3,37	1,172	,486	0.55	0.70	12.23
25	When I wake up, I don't feel motivated for a new day.	3,34	1,243	,536	0.57	0.68	12.73
26	I don't know how to cope with my anxieties.	3,48	1,096	,568	0.59	0.65	13.47
27	I want to give up everything because I feel lost here.	3,80	1,193	,575	0.66	0.57	15.40
28	I feel burned out here.	3,50	1,157	,554	0.64	0.59	14.81
4th Factor: Daily Life Adaptation (α = 0.788)							
32	I know the basic legal regulations of this country.	3,57	,993	,378	0.44	0.81	9.51
33	I know how to travel here.	3,99	,828	,554	0.62	0.62	14.28
34	I know where to buy basic supplies.	4,02	,899	,593	0.69	0.53	16.21
35	I know what to do in a state of emergency.	3,72	1,006	,529	0.61	0.63	14.05
36	I'm getting used to my new lifestyle in this country.	3,93	,830	,512	0.59	0.65	13.43
37	I know how to survive on my budget in this country.	3,87	,953	,516	0.60	0.64	13.74
38	I can deal with everyday problems that I face.	3,86	,902	,549	0.62	0.61	14.40

The internal consistency test was used to determine the scale's reliability. Internal consistency means that items in the scale measure the same construct in relation to one another, and reliability is usually determined by the Cronbach alpha value (Field, 2013). The scale's Cronbach Alpha value is (α=.839), according to internal consistency calculations. Table 10 shows the alpha values for the whole scale and the factors.

Table 10. *Reliability test results and correlations between factors*

Factors	Alpha Value	Correlations between the factors			
		ACA	SCA	PSA	DLA
ACA	.751	1	,313	,229	,207
SCA	.717		1	,194	,407
PSA	.817			1	,220
DLA	.788				1
Total	.839				

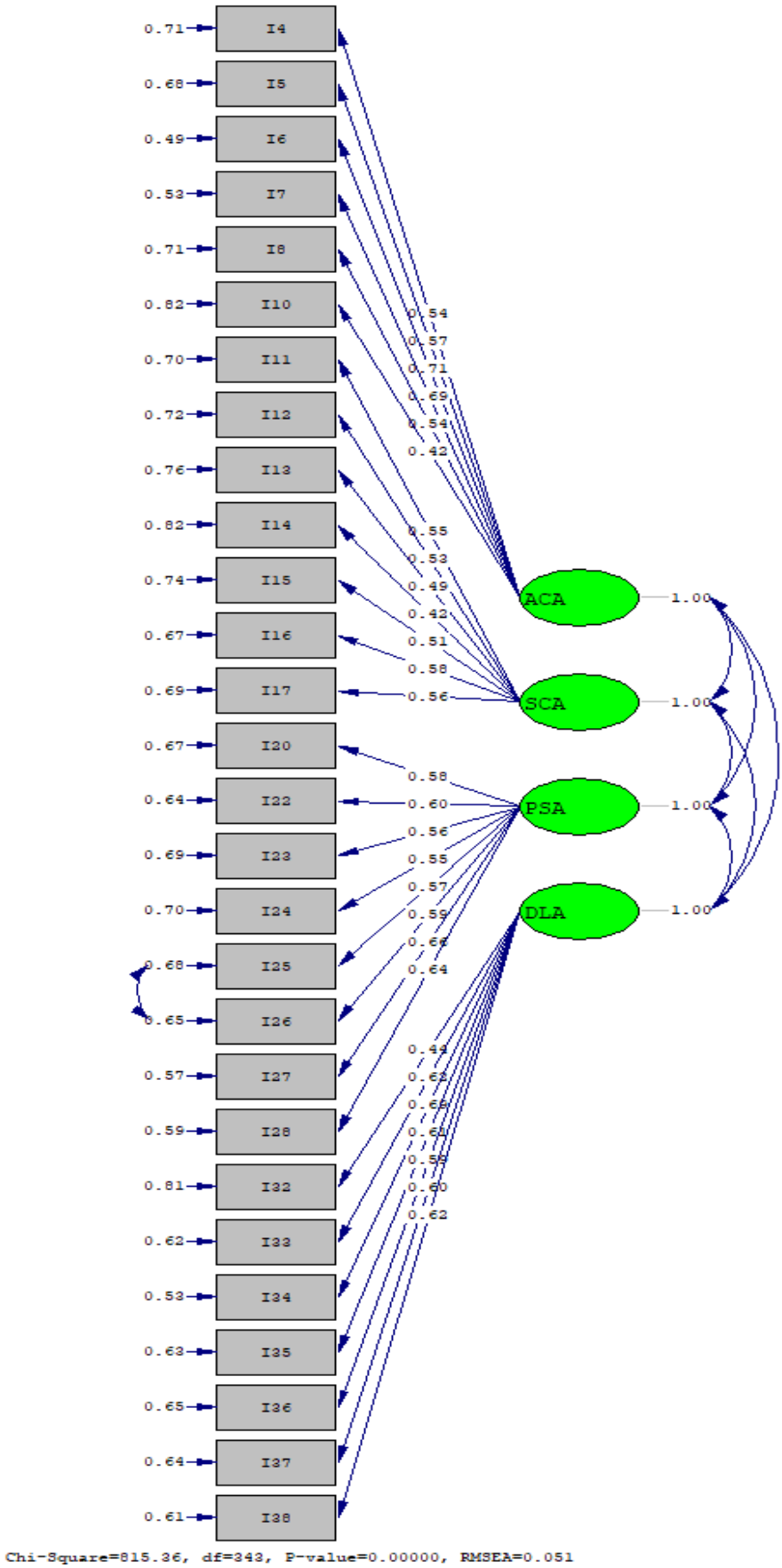
Values between.70 and.90 indicate a high level of reliability, according to the criteria for alpha coefficient appropriateness (Ozdamar, 2011). Similarly, Field (2013) considers alpha values of.70 and.80 to be reliable. These criteria suggest that the scale developed in this study is a highly reliable instrument. Correlations between factors should not be overly high for divergent validity (Kline, 2011). Table 10 shows the correlations between factors, and the values are low, indicating divergent validity.

The scale is designed to yield scores reflecting academic, socio-cultural, psychological, and daily life adaptation, defined as dimensions revealing the sum score for the general adaptation level embedded within the instrument. Thus, the full scale yields four dimensions scores consisting of the sum score for international students' general adaptation level. Elaborating on the mean scores, we developed a score interval to ease the interpretation of the total scale (See Table 11.).

Table 11. *Score intervals for the interpretation of the scale*

Mean score	Classification
1.00 - 1.80	Not adapted
1.81 - 2.60	Partly adapted
2.61 - 3.40	Moderately adapted
3.41 - 4.20	Fairly adapted
4.21 - 5.00	Totally adapted

Figure 6. *CFA Diagram of GASIS*



DISCUSSION, CONCLUSION AND IMPLICATIONS

In recent years, nations have undergone massive economic, social, technological, and educational transformations. Thus, they have started to adopt strategies to go thorough into this global flow of change. In this regard as a significant agent of change (de Wit, 2020) internationalization in higher education has come to fore by becoming a policy priority. Many have employed various practices for internationalization in HE, including the exchange of scholars; developing common curriculum; creating strategic collaborations (Knight & De Wit, 1995); mutual diploma equivalence; implementing course-credit transfer systems (Kehm & Teichler, 2007); opening new branch campuses and international summer programs in different countries (Teichler, 2010); establishing international research centers and providing consultancy services (Van Damme, 2001). Among all, international student mobility has become the core component of this process (Arslan, 2020).

The presence of international students in a host country could bring benefits yet pose some challenges as well. Hence, the cross-cultural adaptation of international students stands out significant in eliminating obstacles or challenges throughout this process. Over the last few decades, the adaptation of international students has drawn scholarly attention with a considerable amount of research. Studies conducted in this setting demonstrate that many distinct variables influence international students' adaptation, and that the adaptation process has a multifaceted structure, as detailed in the literature review. Although there is no complete agreement in the literature on the theoretical discussions on the adaptation of international students and the dimensions of the previously developed scales, academic adaptation, socio-cultural adaptation, psychological adaptation and adaptation to daily life factors come to the fore as the dominant ones.

This research aims to develop a valid and reliable measurement tool that aims to determine the general adaptation level of international students. As the details presented in the methodology, the scale development process was carried out in consecutive steps gathered under five stages. At the beginning of the process, the researchers created an item pool of 64 items based on a comprehensive literature review. At the end of the repetitive review and revise sessions, it was decided to remove the obscure/ambiguous and overlapping items, and the new draft form consisting of 47 items was sent to an expert group for feedback. The number of items in the new draft form was reduced to 38 in line with the feedback from the experts. Fifty international students participated in the pilot study and by their feedback some item expressions were revised.

The implementation step, the critical stage for the scale development process, includes two studies conducted with two separate participant groups. In the first study, which was carried out with 316 international students from 16 different countries, the items in the draft form were gathered under four factors in EFA. These factors, called academic adaptation, socio-cultural adaptation, psychological adaptation, and adaptation to daily life, are in full compliance with the theoretical framework in the literature, and the total variance explained by the four-factor structure is 50.16%. The reliability level for the 28-item scale of four factors was calculated as .88 Cronbach Alpha internal consistency coefficient. Accordingly, both the total scale and the context of the factors have been reported to have a high level of reliability.

In the second study with 527 international students from 47 countries who did not participate in the first study, CFA was conducted to confirm the four-factor structure. In this stage, the $\chi 2/df$ ratio, RMSEA, SRMR, GFI, NNFI, CFI and IFI fit indices were used, and it was found that all values reflect excellent, good and acceptable levels of fit. Thus, the scale can be considered reliable with an internal consistency coefficient of .84. In addition, after CFA, the factor loadings of the items were moderate and significant, indicating convergent validity. Besides, the fact that the correlation levels of the factors validated in CFA were not high indicates divergent validity. Based on the results obtained from the EFA and CFA studies and observed the internal consistency coefficient values, GASIS is an original, valid and reliable measurement tool that could be utilized to determine the general adaptation levels of international students in higher education.

Despite a substantial volume of research in the vast literature on "adaptation" studies for international students, there is still limited unanimity on what exactly constitutes the notion of adaptation. As apparent above, the concept has been defined, interpreted, and measured in a multitude of ways and from a variety of perspectives. In this regard, numerous measurement instruments have been operationalized to assess the adaptation of international students (e.g., Anderson et al., 2016; Bikos et. al., 2020; Brenner, 2001; Davies et al., 1988; Karakuş & Akay, 2020; Sandhu & Asrabadi, 1998; Searle & Ward, 1990). GASIS flexible and modifiable in character, stands out different among all other instruments above. SESCAS, for instance, focuses on self-efficacy for the sociocultural adaptation in two different cultural contexts (Bikos et al.,2020) and the factors of SISHE were mainly about the academic adaptation and partly sociocultural life at university. Similarly, AAS (Anderson et al., 2016) was developed to determine the academic adaptation of international students, whereas MHI-5 (Davies et al., 1988) is an instrument to measure the psychological adjustment of sojourners. In addition, IASE (Brenner, 2001) has eight factors related to intercultural adjustment, ASSIS (Sandhu & Asrabadi, 1988) has six factors to assess acculturative stress of international students. Last but not least, SCAS (Searle & Ward) which is the most cited scale in the adaptation literature based on sociocultural adaptation of international students and focuses only on intercultural competence. Therefore, in an attempt to bring conceptual integration to a scattered field of scales, GASIS with multiple dimensions of the adaptation concept could meaningfully be utilized as a valid and reliable tool. Although, the study offers a new empirically tested instrument to assess international students' adaptation, there are also some issues to be addressed in future research. The sample for this study includes international undergraduate students from a single Turkish state university that poses a limitation. Yet, future studies can amplify their samples by including international graduate/postgraduate students from state and private universities across borders for having a broad basis and greater implications. Besides all, additional predictors for international students' adaptation could be identified and explored further by incorporating various theoretical frameworks into the vast amount of adaptation research on international students.

ACKNOWLEDGEMENT

We are grateful to the international students participated in the research.

AUTHOR CONTRIBUTION

Both authors have made substantial contributions to the conceptual framework of the research. They both developed the GASIS scale together. The first author wrote the methodology, collected the data and conducted the EFA on SPSS. The second author wrote the introduction, performed the CFA on Lisrel and was responsible for drafting the manuscript and revising it critically for important intellectual content. Both authors have contributed the discussion, conclusion, and implications. They read and agreed to the published version of the manuscript together.

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