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Development and Validation of the Trust in Higher Education Scale (THES): A Mixed-Methods Approach

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This research aims to develop and validate the Trust in Higher Education Scale (THES) by adopting a theoretical-empirical approach. In the study, the stages of the exploratory sequential design, which is one of the basic designs of mixed research methods, were followed. In this context, in the first stage, qualitative data were collected from 20 undergraduate students and analyzed by using content analysis method. In the second stage, an item pool with 21 items was created based on the data analysis results. The created items were applied to 366 and 513 undergraduate students at two separate sessions. Then, scale development procedures such as reliability, substantive validity, structural validity, external validity, exploratory factor analysis, and confirmatory factor analysis were performed on this data set, which was collected in three stages. As a result of the analysis, a valid and reliable scale consisting of 14 items and one dimension emerged. It is thought that the current research is important in terms of being the first attempt to reveal a valid and reliable measurement tool for trust in higher education and reveal or confirm the potential elements of trust in higher education.

Introduction

The first studies on the perception of trust in higher education (THE) emerged in the USA due to the significant fluctuations in graduation rates in higher education (HE) since the middle of the 20th century, and gained momentum in the following period (Deniz, 2020; Schofer & Myer, 2005; Tinto, 1975). However, despite the historically critical importance of higher education institutions (HEI) in providing information access to a broad section of the public and achieving long-term goals, public THE institutions has received little attention, especially outside the United States (Enders, 2013; EUA, 2011; Johnstone & Marcucci, 2007). Therefore, research on individuals' THE institutions in non-Western societies is extremely limited and further research is needed (e.g., Francioni et al., 2021; Schofer & Myer, 2005). On the other hand, existing studies have mostly investigated trust in institution

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administrators and instructors (Hoy & Kupersmith, 1985; Tarter et al., 1995). At this point, the link between system trust and personal trust has often been overlooked (Giddens, 2013).

Trust, or more specifically, THE, is critical in the interaction between policymakers and other stakeholders (Dzimińska et al., 2018; Kistyanto et al., 2021; Leveille, 2006). It is emphasized that THE is effective in the evaluations of the students during the transition to HE, and this has important effects on the academic performance of the students (Slade et al., 2019) satisfaction and loyalty (Heffernan et al., 2018; Schlesinger et al., 2016). Moreover, some studies emphasize that there is a crisis of trust in education and science (Shiriajev et al., 2019). It is argued by some researchers that THE in institutions is inherently fragile and easily lost (Boronski & Hassan, 2015; D’Cruz, 2018).

Recently, there have been discussions in the literature about whether the public’s THE is high or low (Leveille, 2006; Trow, 1996). Bird (2013), attributes this to the extremely diverse curriculum in HE and the difference between social strata. However, a Gallup study in the United States showed that from 2015 to 2018, public trust in HE institutions fell by about 10%. A recent study published in Sweden indicates a slight downward trend in THE in the last ten years (Vetenskap & Allmanhet, 2011). Similarly, Guppy and Davies (1999) found that grades of quality, satisfaction, and trust in public education in Canada slowly but consistently declined across all population subgroups. However, they stated that the existing questionnaire items or questions are not clear enough and therefore are interpreted in different ways by researchers (e.g., Barlow & Robertson, 1994) education-school confusion). In addition, sufficient information was not provided about the validity and reliability of the data collection tools used in these studies (e.g., Bormann & Thies, 2019; Francioni et al., 2021). In this direction, the peculiarities of the specific questions indicated that a more “valid and reliable scale” was needed to confirm the trends.

To fill these gaps in literature, the current research has focused on developing a valid and reliable measurement tool to determine student THE institutions. At this point, the original contribution of the study is to support HEI to take various actions to ensure student trust and thus to ensure their sustainability by revealing the main determinants of trust towards HEI. Numerous researchers suggest that the theoretical and empirical approaches should use together in developing and validating a measurement tool (Frenzel et al., 2016; Hong et al., 2016). The use of this approach contributes to the content validity of the items in the measurement tool and the scale as a whole (Burić et al., 2018). Based on all of these, the aim of the research is to develop and validate THES in the context of Türkiye by adopting a theoretical-empirical approach. In this context, the research questions are summarized as follows:

- (1) How are undergraduate students’ views of THE?
- (2) Is THES reliable?
- (3) Is the THES essentially valid?
- (4) Is the THES structurally valid?

Literature Review

Theoretical Framework

The theoretical background of this study, which focuses on THE, is based on Giddens’ (2013) theory of trust. According to Giddens (2013), trust is a belief held despite



understanding. As a matter of fact, the concept of trust has been generally accepted as “confidence in one’s expectations” in the literature (Anderson & Weitz, 1992; Enders, 2013; Luhmann, 2018). Based on this widespread acceptance in the literature and the emphasis of Giddens, the statement “I believe”, which is thought to express this expectation, is included in the scale items created within the scope of this study. This emphasis made by Giddens within the scope of the current research is supported by the theoretical expansion (i. student-faculty, ii. student-institution, and iii. faculty-institution) of Dzimińska et al., (2018) for students in HEI. Thus, the theoretical framework of student THE in the research were drawn.

The Concept of Trust

Trust is used in the literature with many different meanings in cultural, sociological, and philosophical contexts (Giddens, 2013; Kistyanto et al., 2021; Paine, 2008). However, many studies specifically address the concept of trust, which includes an explanation of the status quo from a rational choice perspective. The rational choice perspective argues that trust emerges through a set of mutually rational expectations (Coleman, 1990; Six, 2008; Tierney, 2008). In this sense, it can be stated that trust connects both the past and today’s expectations of the future. Moreover, it offers an efficient way of dealing with uncertainty and over-complexity (Morgan & Hunt, 1994; Trong & Rowley, 2016).

The critical importance of trust in developing and maintaining long-term relationships has made it the subject of many disciplines (Ghosh et al., 2001; Gregory et al., 2009; Johnson & Cullen, 2017). In the professional context, the concept of trust is more associated with satisfaction (Jain et al., 2016; Schlesinger et al., 2016), commitment (Ng, 2015; Potgieter & Mathonsi, 2021), loyalty (Schlesinger et al., 2016; Snijders et al., 2020), responsibility (Harrison, 2018; Whitbeck, 2005), cooperation (Fard & Karimi, 2015; Jain et al., 2016), efficiency (Mayer et al., 1995), effectiveness (Anderson & Weitz, 1989), productivity (Kramer & Tyler, 1996), risk-taking (Anderson & Weitz, 1989; Mayer et al., 1995), image (Harsono, 2015), and engagement (Heffernan et al., 2018). Based on the literature, the concept of THE has been discussed in this study as “the degree of contributing to the development of the society in a more general context, which will help the student reach their professional career goals by providing their academic and social development”.

It is frequently stated in the literature that the strategic management of trust gains more importance under the conditions of increasing competition (Kramer & Tyler, 1996; Wang et al., 2014). As a matter of fact, gains for innovation and progress can be obtained from open and transparent interactions at the point where trust is built (Jain, 2016; Spier, 2013). Conversely, unmet expectations lead to decreased trust, more scrutiny, and questions about why people’s hopes are not fulfilled (Helmiati et al., 2018; Leveille, 2006). In summary, trust builds over time, and the creation of a trusting relationship is highly dependent on the competence of the trusted person/institution and the social and cultural contexts in which individuals are found (Tierney, 2008).

Students’ THE as part of Public Trust

HEI, which are accepted as a “social contract,” provide the legitimacy they need with the assurance of the public, which is a normative control system, apart from the sources of legislation and states (Fukuyama, 1995; Suchman, 1995). Considering this relationship’s strength and significant impact, HEI are responsible for creating a sense of trust and confidence (Blašková et al., 2021). There are important factors that should be considered by public authorities and HEI, such as increasing student participation and success, establishing a

sound financial balance, developing a clear and sustainable social contract, and providing quality education under appropriate conditions (Deniz, 2022; Eurydice, 2016; Sá & Serpa, 2020). The important thing here is to build an environment where both can support each other (Dzimińska et al., 2018; Hansen et al., 2019; Whitbeck, 2005).

THE in institutions is related to both social and organizational trust (Giddens, 2013; Huber, 2013). Because individuals establish relations with each other in HEI and develop an attitude towards the institution based on these relations over time (Tierney, 2008). In particular, faculty members, institution managers, and other personnel significantly impact students' trust (Bird, 2013). With this, trust is very important in students' transition to HE, continuing this education and ensuring their loyalty (Trowler, 2015). Some researchers (e.g., Bhattacharya & Sen, 2003; Heffernan et al., 2018) suggest that students' reactions to university are related to trust in their institutions. This trust contributes to HEI improving their quality and diversifying their services (Bormann & Thies, 2019; Ghosh et al., 2001).

The decrease in THE institutions can lead to the point that threatens the existence of the organization (Kramer & Tyler, 1996). Because trust is a necessary condition for the development of science in societies (Serpa & Sá, 2022; Weingart, 2013). Leveille (2006) emphasized, "...individual and institutional integrity must prevail if HE is to maintain the public's trust". Therefore, individuals and institutions should be committed to "doing the right thing" and maintaining public trust as part of their professional responsibilities (Bird, 2013; Kharouf et al., 2015). Otherwise, decreasing public trust raises concerns about the system as a reflection of its perceived inadequacies and has more profound policy implications than these legislative reforms (Guppy & Davies, 1999). In most countries with HE systems, it is becoming increasingly evident that as time passes, the government and its ministries place less trust in the HEI they partially fund (Vidovich & Currie, 2011). Especially with the beginning of significant fluctuations in important institutional productivity measures such as graduation rates (Hansen et al., 2019; Schofer & Myer, 2005), HEI tried to control these expectations and risks by establishing more administrative structures in the 20th century (Rhoades, 1998).

Method

In this study, exploratory sequential design, one of the mixed research methods, was used (Creswell, 2014). In this context, in the first stage of the study, qualitative data on the factors affecting the trust of undergraduate students in HE were collected, and the collected data were analyzed. In the second stage of the research, scale development procedures were carried out based on the quantitative data obtained.

Research Context

This study was carried out in a state university in the Southern Marmara region of Türkiye in the fall semester of the 2022-2023 academic year. The Southern Marmara region is located in the west of Türkiye. Some factors were effective in the selection of this university and city. The first is that the students in the selected city and university have a socio-economically cosmopolitan student population coming from different regions and cities of Türkiye. Secondly, the fact that the selected university is a state university is that approximately 92% of current students enrolled in HE in Türkiye study at state universities (CHE, 2020).



Participants

Study 1

Qualitative data were obtained from 20 students attending different faculties of a university located in the South Marmara region of Türkiye and determined by the maximum sampling method. Participants were included in the study according to their gender, faculty, and branch to ensure maximum diversity. 10 (50%) of the participants are female, and 10 (50%) are male. Two (10%) science and literature, two (10%) fine arts, two (10%) law, two (10%) economics, and administrative sciences, two (10%) theology, and two (10%) architecture-engineering, two (10%) education, two (10%) health sciences-medicine, two (10%) sports sciences, and two (10%) tourism faculties. Finally, five (25%) of the participants attend the first grade, five (25%) attend the second grade, five (25%) attend the third grade, and five (25%) attend the fourth grade. To ensure anonymity, participants were coded as P1, ... P20.

Study 2

The research population consists of approximately 30 thousand undergraduate students attending different faculties of a university located in the South Marmara region of Türkiye in the 2022-2023 academic year. This number assumes that 381 students can represent a population at a significance level of 0.5 and a confidence level of 95% (Cohen, Manin, & Morrison, 2011). First of all, faculties with undergraduate departments in the relevant university were determined in this direction. Then, a total of 500 questionnaires were distributed to each faculty, with 50 questionnaires. Out of 500 distributed scales, 403 (81% response rate) were returned, and 366 items were analyzed because 37 of them had incomplete and incorrect data (more than one marking on the same item, more than 10% unmarked item). Accordingly, 191 (52%) of the participants were female, and 175 (48%) were male. 43 (12%) of the participants were college of science and literature, 32 (9%) college of arts, 35 (10%) college of law, 39 (11%) college of economics and administrative sciences, 30 (8%) college of religion, 39 (11%) college of architecture-engineering, 45 (12%) college of education, 33 (9%) college of health sciences-medicine, 36 (10%) college of sports sciences and 34 (9%) college of college of tourism. Finally, 89 (24%) of the participants are in first grade, 101 (28%) are in second grade, 81 (22%) are in third grade, and 95 (26%) are in fourth grade.

Data Collection Process

Study 1

In the first stage of research, the researchers developed a semi-structured interview form by considering relevant literature (e.g., Dzimińska et al., 2018; Francioni et al., 2021; Guppy & Davies, 1999; Schofer & Meyer, 2005) to determine the main determinants of THE. Six main and four follow-up questions were developed in the semi-structured interview form based on the relevant literature. In order to ensure the content validity of the draft interview form, the opinions of four experts and two students were taken. The pilot application of the interview form developed on two students was carried out. In the pilot application, it was decided that all the questions in the interview form were understandable, and then face-to-face interviews were conducted. There are some questions such as: “What are the factors that direct you to higher education?”, “What are your basic expectations regarding higher education?”, “How would you evaluate your experiences in the higher education process as a

whole?” and “What kind of contributions do you think higher education has made for you?” in the interview form which is created. The interviews conducted within the scope of the study were audio-recorded and transcribed after obtaining permission from the participants. Then, in order to confirm the accuracy of the interview texts, the written texts were sent via e-mail and examined by the participants, and their approvals were obtained. In addition, before all interviews were conducted, the participants were informed about the purpose and scope of the study, and their informed consent was obtained. Interviews with the participants lasted an average of 45 minutes.

Study 2

In the second stage of the study, an item pool consisting of 21 items was created based on the qualitative findings, and the scale development stages were followed. Two new items were added to the item pool by using relevant literature, and a total of 23 items were reached. The content validity of the raw scale was examined by six experts (Krabbe, 2017). In line with expert opinions, four items were dropped, one item was added, and six items were changed due to insufficient confidence ratings. The item pool created at the end of this stage consisted of 20 items. A five-point Likert type raw scale form, which includes the options “strongly agree”, “agree”, “neither agree nor disagree”, “disagree”, and “strongly disagree”, was applied to 366 undergraduate students. EFA was performed based on this data set. Then, to test the suitability of the structure obtained in EFA, data were collected from 513 students, and CFA was applied.

Data analysis

Study 1

The data were analyzed with the content analysis technique in this study. To perform data analysis in study, first of all, raw data was transferred to digital media. Then, the data were manually coded with the “open and axial coding method”, and “words and word groups” were taken as the analysis unit. After coding for all data, a code list was created, and deductive analysis was performed to verify the accuracy and suitability of these codes (Patton, 2014). The coding of the quantitative data set was completed by doing a final reading at a different time. Then the study's second author re-coded the same raw data following the same processes. The researchers discussed the different encodings, re-coded these codes, and reached a consensus.

Study 2

At the quantitative stage of the research, 366 data were collected in the statistic program were first examined whether they showed a normal distribution. As shown in Figure 1, the results obtained show that skewness .161 (SD= .128) and kurtosis -.570 (SD= .254) “values are between +1.5 and -1.5, which is accepted as normal distribution value, and the data show normal distribution” (Tabachnick & Fidell, 2013).



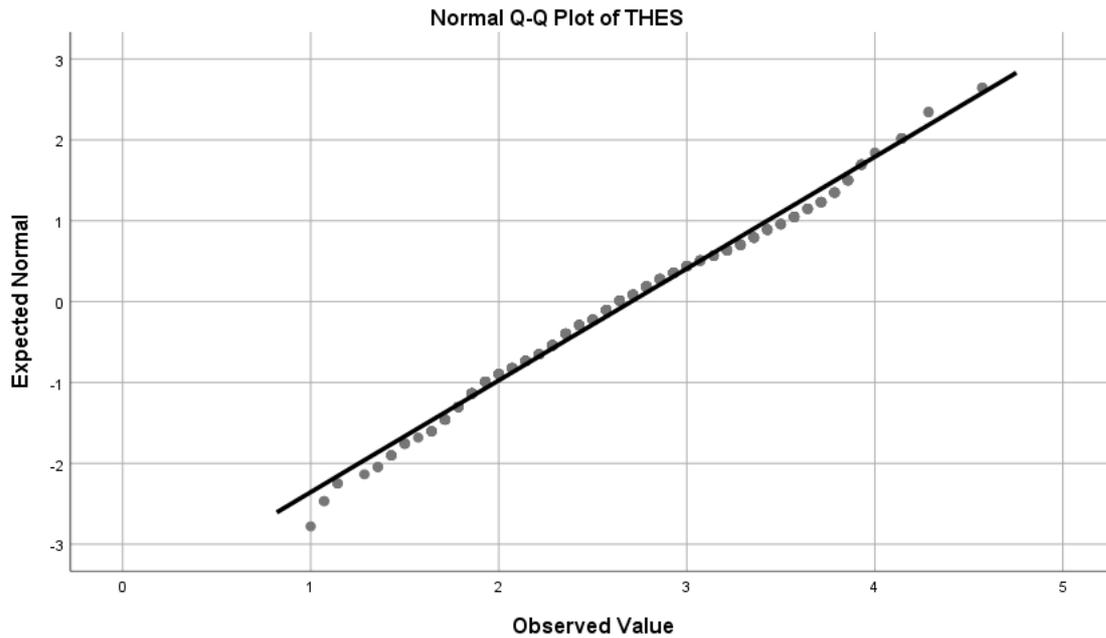


Figure 1. Plot of normality.

Then, exploratory factor analysis (EFA) was applied to 366 data. The following criteria were used in the EFA procedure using Varimax rotational principal component analysis: (1) cross-loading of all items less than 0.30; (2) all items with regression loads greater than 0.50 in their intended conceptual factors; (3) three or more conceptually aligned items in one factor; (4) all items without negative error variance (Costello & Osborne, 2005; Field, 2013; Kalaycı, 2018). In this process, seven items were removed from the THES. Then, Cronbach Alpha internal consistency, KMO and Bartlett test results were examined. After the EFA procedures, the scale was re-administered to 513 undergraduate students in order to determine the external validity of the THES over the 14-item model, and CFA was performed using LISREL 8.80 (Jöreskog & Sörbom, 2001).

Researchers' role

This research was carried out with the motivation of understanding the determinants of undergraduate students' THE. In addition, the superficial handling of the subject and the absence of a valid and reliable measurement tool encouraged the scale development process. The first researcher completed his undergraduate education here, and the second author worked at this university. Therefore, the familiarity of both researchers with the context (city and university) in which they obtained the data has been a facilitating and supportive element in the interpretation of the data.

Findings

Study 1

The code list created as a result of the findings obtained from the quantitative data in the research and the item pool created based on these codes are shown in Table 1.

Table 1. Code list of undergraduate students' views of THE.

No	Codes	Created Item Pool
1.	Have a variety of programs	I believe that the vocational program diversity of higher education institutions is at a sufficient level.
2.	Providing dormitories	I believe that higher education institutions have enough dormitories to meet the accommodation needs of students.
3.	Having social opportunities	I believe that higher education institutions have sufficient social opportunities to meet various student activities.
4.	Ensuring career progression and success	I believe that a university education is the best investment for people who want to advance and be successful in their careers.
5.	Increasing the quality of education	I believe that the primary purpose of universities today is to increase the quality of education.
6.	Ensuring to have a good education background	Today, I believe that universities provide students with a good educational background.
7.	Efforts of university administrators	I believe that administrators working in higher education institutions constantly strive for a good education.
8.	Efforts of academic staff	I believe that the academic staff working in higher education institutions constantly strive for a good education.
9.	Professional practice	I believe that the education received in higher education gives the individual a sufficient level of practice related to his profession.
10.	Ensuring behavioral development	I believe that higher education institutions are as concerned with the behavioral dimension of education as they are with the academic dimension.
11.	Delivering high quality education	I believe that higher education institutions offer high quality education.
12.	Responding to the demands of individuals	I believe that higher education institutions are qualified to respond to the demands of individuals.
13.	Collaborating with the business world	Today, I believe that higher education institutions are in sufficient cooperation with the business world.
14.	Providing a better quality of life	I believe that the degree obtained after higher education brings with it a better quality of life.
15.	Providing a better job opportunity	I believe that it will be important to have a university education in order to get a good job in the future.
16.	Ensuring success in business	I believe that to be successful in today's business world, a person must have a good college education.
17.	Obtaining the knowledge and skills necessary for the job	I believe that the knowledge and skills necessary for the job can be obtained during higher education.
18.	Developing programs according to student needs and expectations	I believe that higher education institutions develop their programs according to expectations to serve today's students' needs better.
19.	Continuous self-development according to student needs	I believe that higher education institutions are constantly improving themselves to serve today's students' needs better.
20.	Exchange to meet student needs	I believe that higher education institutions are changing to meet today's students' needs better.
21.	Contributing to the development of the country	I believe that higher education institutions will carry the country to better places in the future.

In Table 1, the 21-item code list is formed as a result of the content analysis, and the scale items written based on this code list are listed. The 21-item draft scale obtained at this stage was prepared in order to collect data and perform the necessary analyzes in the second stage of the research.

Study 2

In this section, the validity and reliability studies of the THES, which was created based on the findings of the 1st study, are discussed. Firstly, a 21-item raw scale was applied to 366 HE students, and EFA was conducted by using responds. During the analysis process, seven items in the item pool were excluded from the analysis because the cross-loading of the items was less than 0.30. In this analysis process, each item was removed from the draft scale form one by one, and the analyzes were repeated. “Anti-image Correlation” was examined to check the suitability of the 14-item scale for analysis. Accordingly, the values vary between .853 and .959. Then, the correlation matrix values showing the relationship between the 14 items in the scale were examined. It was determined that each item in the scale had a correlation value of .36 or more with at least three different items. In addition, the correlation between the items in the correlation matrix is greater than .30 and less than .90 (the highest value is .79), and the determinant coefficient is .01, indicating no multicollinearity problem between the items. These findings showed that each scale item was suitable for factor analysis. On the other hand, the KMO value is checked to determine whether the sample size is suitable for EFA, and the relevant value is found as .920. Bartlett’s Test of Sphericity is used to test whether the assumption of multivariate normal distribution is met ($\chi^2 = 2437.441$, $df = 91$, $p < 0.001$). To determine the number of factors, the plot graph was examined, and it was decided that the scale had a single factor structure (see, Figure 2).

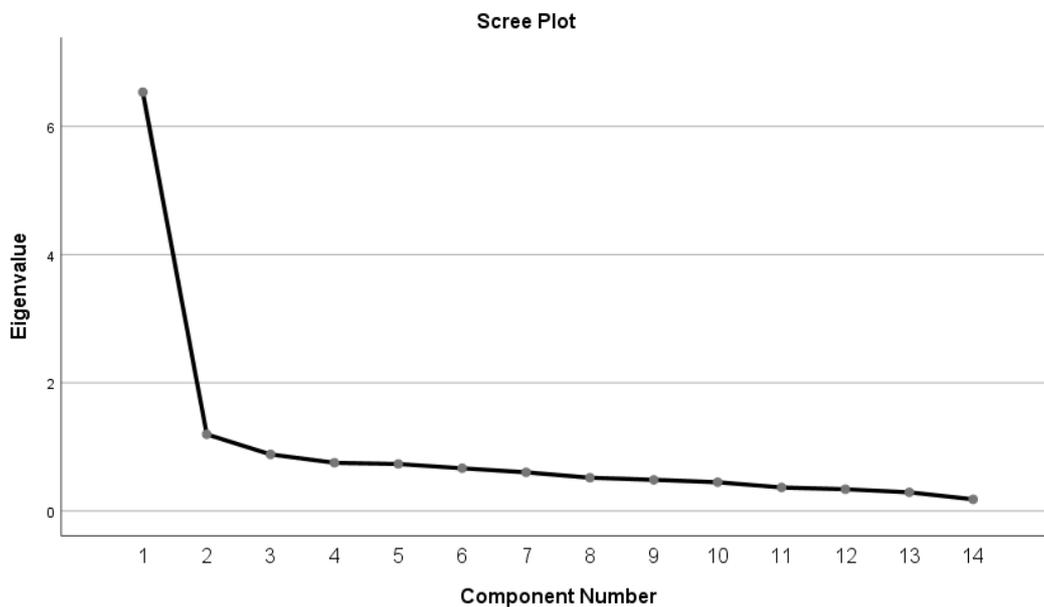


Figure 2. Scree plot of THES data.

When Figure 2 is examined, it is seen that the scale has a significant break in the first dimension. From this point of view, it was decided that the scale was one-dimensional, and the following analyzes were made accordingly. In Table 2, the factor eigenvalue, explained variance ratio and total variance ratio related to the single factor structure of the scale are given.

Table 2. Eigenvalues of factors and explained variance ratios.

Factor	Eigenvalues	% of Variance	Cumulative %
1	6.535	46.678	46.678

Table 2 shows that a single factor construct with an eigenvalue of one explains 46.678% of the total variance. Table 3 shows the “rotated principal component analysis” results.

Table 3. EFA analysis results.

No	Item	Extraction	Corrected Item-Total Correlation	Factor Loading/Component
1.	I believe that the vocational program diversity of higher education institutions is at a sufficient level.	,322	,506	,568
2.	I believe that higher education institutions have sufficient social opportunities to meet various student activities.	,327	,507	,571
3.	Today, I believe that universities provide students with a good educational background.	,443	,603	,666
4.	I believe that administrators working in higher education institutions constantly strive for a good education.	,419	,587	,647
5.	I believe that the academic staff working in higher education institutions constantly strive for a good education.	,326	,513	,571
6.	I believe that the education received in higher education gives the individual a sufficient level of practice related to his/her profession.	,476	,628	,690
7.	I believe that higher education institutions are as concerned with the behavioral dimension of education as they are with the academic dimension.	,443	,605	,665
8.	I believe that higher education institutions offer high quality education.	,582	,706	,763
9.	I believe that higher education institutions are qualified to respond to the demands of individuals.	,562	,693	,750
10.	Today, I believe that higher education institutions are in sufficient cooperation with the business world.	,323	,501	,763
11.	I believe that higher education institutions develop their programs according to expectations to serve today’s students’ needs better.	,558	,682	,750
12.	I believe that higher education institutions are constantly improving themselves to serve today’s students’ needs better.	,624	,727	,790
13.	I believe that higher education institutions are changing to meet today’s students’ needs better.	,633	,738	,795
14.	I believe that higher education institutions will carry the country to better places in the future.	,497	,640	,705

Table 3 shows that the common factor variance for the scale items of THES, which consists of a single factor, varies between .322 and .633, the item-total correlations are between .506 and .738, and the factor loading values are between .568 and 795. Afterward, Reliability



analysis was performed for the scale within the scope of EFA and Cronbach's alpha values were found to be 0.90 and 0.91. These values show the reliability of the scale. To check the goodness of fit of the construct obtained as a result of EFA, new (n = 513) data are collected from HE students, and then a quadratic CFA is performed. Chi-square goodness of fit value was found significant as a result of the analysis ($\chi^2 = 209.66$, $df = 72$, $p < 0.001$). Then, the model fit indices were examined, and these indices are presented in Table 4.

Table 4. Fit Indices and values of CFA.

Fit indices	Criteria*		Values	Decision
	Perfect Fit	Acceptable Fit		
χ^2			209.66	
Sd			72	
χ^2/sd	$0 \leq \chi^2/sd < 2.5$	$2.5 \leq \chi^2/sd < 3$	2.91	Acceptable
RMSEA	$\leq .05$	$\leq .08$	0.061	Acceptable
RMR	$\leq .05$	$\leq .08$	0.035	Perfect
SRMR	$\leq .05$	$\leq .08$	0.041	Perfect
NFI	$\geq .95$	$\geq .90$	0.93	Acceptable
NNFI	$\geq .95$	$\geq .90$	0.94	Acceptable
CFI	$\geq .95$	$\geq .90$	0.096	Perfect
IFI	$\geq .95$	$\geq .90$	0.096	Perfect
RFI	$\geq .95$	$\geq .90$	0.092	Acceptable
GFI	$\geq .90$	$\geq .85$	0.94	Perfect
AGFI	$\geq .90$	$\geq .85$	0.92	Perfect

Source: Schumacker & Lomax, 2010, p. 76.

According to Table 4, RMR, SRMR, CFI, IFI, GFI and AGFI show excellent fit, while χ^2/df , RMSEA, NFI, NNFI and RFI show acceptable fit. The model structure consisting of 14 items and a single factor is shown in Figure 3.

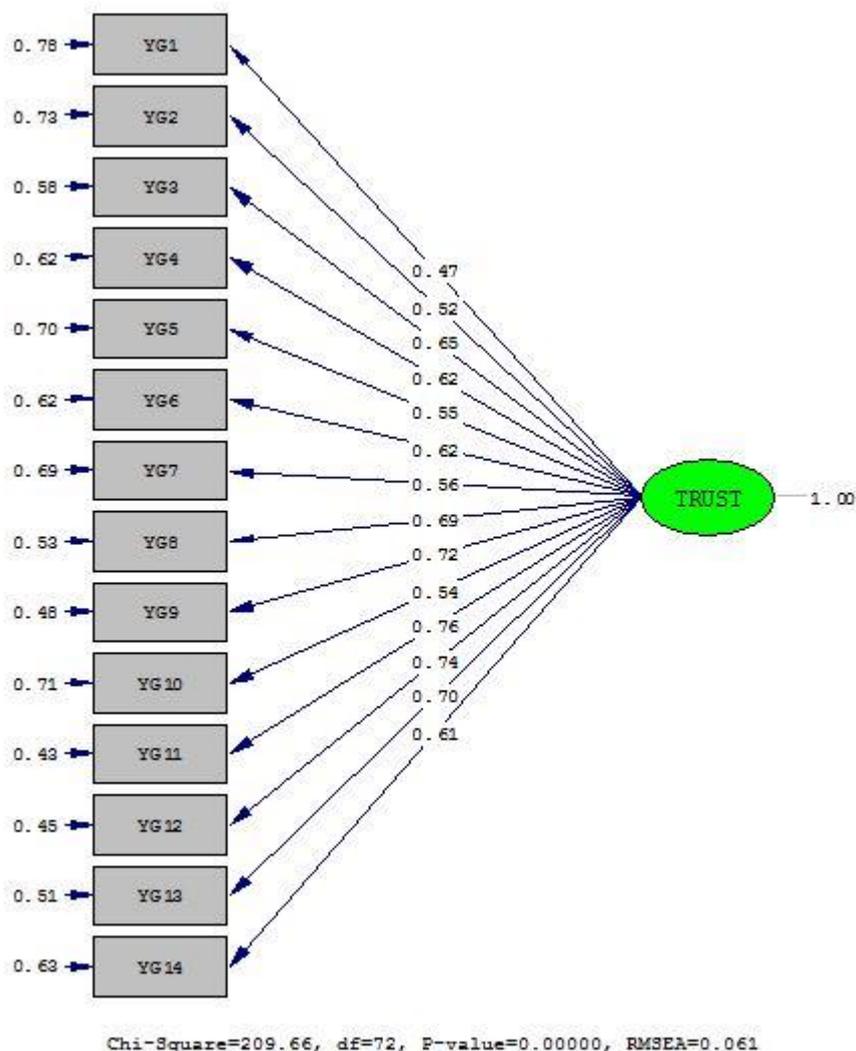


Figure 3. Model related structure.

According to Figure 3, the item-total correlation values of the scale items vary between .47 and .76. These coefficients show the relationship between each variable and the latent variable. Item-total correlations show the relationship between each variable and its corresponding latent variable. The higher this value, the higher the variable explains its latent variable. In line with these values, it can be said that the scale items have a good fit in distinguishing the feature to be measured.

Discussion and Conclusion

The purpose of this study is to develop and validate the THES (Appendix-1, 2) by adopting a theoretical-empirical approach. In this context, in the first part of the study, qualitative data on the factors affecting the confidence of 20 undergraduate students in HE were collected, and the collected data were analyzed by content analysis method. In the second part of the study, scale development procedures were carried out based on the quantitative data obtained.

In the quantitative phase of the research, firstly, a 21-item draft scale was applied to 366 HE students, and then EFA was performed. During the analysis process, 7 items in the item pool

were excluded from the analysis because they did not meet the necessary criteria. According to the Anti-image correlation matrix, the values range between .853 and .959. Then, the correlation matrix values were examined, and it was determined that each item showed a correlation between at least three different items in the scale, varying between .36 and .79. In addition, the coefficient of determinant was determined as .01. It is stated that this value should be above 10^{-5} in order to be considered a multi-connection problem (Field, 2013). The KMO value is checked to determine whether the sample size is suitable for factor analysis, and the relevant value is found to be .920. According to Field (2013), the KMO value should be greater than 0.5. According to this result, the KMO value is suitable for the analysis.

Kalaycı (2018) reports that items with low common factor variance can be excluded from the analysis in the EFA process in order to increase the total variance explained. From this point of view, seven items with a common factor variance of .30 and below were removed from the scale in the EFA process. It was determined that the item-total correlation values ranged between .50 and .74. It shows that these values are .50 and above, which is considered good for the item factor load value (Kalaycı, 2018). Results from the EFA procedure for the THES yielded an original one-factor solution with eigenvalues >1 , accounting for approximately 46.68% of the variance characterized by an adequate sample size (Kaiser-Meyer-Olkin = 0.92; Bartlett's test of sphericity/ Bartlett's Test of Sphericity $\chi^2 = 2437.441$, $df = 91$, $p < 0,001$). According to Kline (2014), it is sufficient for the explained variance to be 40% or more. In this respect, it can be stated that the variance value explained by the scale is sufficient. In addition, in the reliability analysis performed on the scale items and the whole single factor scale, it was seen that Cronbach's alpha values ranged from .90 to .91. These values indicate that the scale is reliable.

The described explanatory model was evaluated by CFA, which enables better detection of substances with weak charges and violating the structure. A multi-criteria approach was adopted for acceptable model fit (Marsh et al., 2004; Schumacker & Lomax, 2010). As a result of the analysis, the CFA model gave a good model fit index with the 14-item ($\chi^2 = 209.66$, $df = 72$, $p < 0.001$; GFI = 0.94, AGFI = 0.92, CFI = 0.96, NFI = 0.93, NNFI = 0.94, SRMR = 0.041 RMR = 0.035, RMSEA = 0.061, RFI = 0.92, IFI = 0.96). A result of the internal consistency analysis of the model obtained determined that the Cronbach alpha values had a range between 0.90 and 0.91, and the average value was 0.91. These results indicated that the developed scale was reliable enough and that the model could be used meaningfully in further analyzes.

Implications and Future Research

This research appears to be valuable in several different ways. First, this research is important in terms of revealing the potential basic elements of THE from a theoretical point of view, based on the codes obtained from the qualitative data and the scale items created based on them. This contribution becomes even more important when it is considered that the basic elements of THE are still in the "knowledge creation" stage. In addition, it will contribute to the conceptual understanding of the antecedents, nature and consequences of THE by encouraging new research that will provide knowledge production in the literature. Secondly, from a methodological point of view, this research is the first attempt to measure THE with a valid and reliable tool. In this respect, the research will facilitate the discovery of the relationship between THE and other independent structures (personal variables, organizational factors, etc.). Moreover, it contributes to the elimination of this deficiency by considering the emphasis on the lack of mixed methods approaches in educational research.

Third, in practical terms, the present research enables HEI and HE boards (e.g., CHE in Türkiye) to measure university students' perceptions of trust instantly and periodically towards HE through a valid and reliable tool. Indirectly, these results will encourage efforts/policies to ensure university students' THE. In this direction, it is recommended that HEI adopt a primary duty to create a culture for ensuring student trust as an important factor in increasing their efficiency and maintaining their existence.

Although the current results show that the THES is valid and reliable, there are some limitations regarding the research. First, data obtained from a single state university in Türkiye's Southern Marmara Region cannot rigidly limit the expectations of undergraduate students' trust in HE across the country. Therefore, inferences based on research findings are limited to the sample rather than the whole. Also, this scale is only static. Thus, students' trust levels in HE can only be obtained instantly. We recommend periodic measurements in different geographical regions and universities to reduce this negative impact. Second, the THES developed within the scope of this research cannot strictly limit undergraduate students' THE. On the other hand, it was not the researchers' intention since the design phase of the study to develop a comprehensive scale that would address all aspects of THE. Instead, the researchers developed a short, powerful, and more inclusive scale that assessed key determinants of THE. In this context, we obtained a scale with proven validity and reliability by taking support from the relevant literature and the results obtained from the quantitative stage. We hope that subsequent researchers will confirm the structure of THES, contribute to the development of the scale (new determinants of THE), or create new scales in different countries.

Note

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Ethical permission for this research was taken from the Balıkesir University Social and Human Sciences Ethics Committee (No.: E-19928322-302.08.01-233863).

The authors allow the scientific use of the “Trust in Higher Education Scale” developed within the scope of this research, provided that this article is cited.

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Appendix-1

Trust in Higher Education Scale

After reading the statements below in order, evaluate your views on the items aiming to measure confidence in higher education by placing a cross (x) in the appropriate option on the right.	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
1. I believe that the vocational program diversity of higher education institutions is at a sufficient level.	⑤	④	③	②	①
2. I believe that higher education institutions have sufficient social opportunities to meet various student activities.	⑤	④	③	②	①
3. Today, I believe that universities provide students with a good educational background.	⑤	④	③	②	①
4. I believe that administrators working in higher education institutions constantly strive for a good education.	⑤	④	③	②	①
5. I believe that the academic staff working in higher education institutions constantly strive for a good education.	⑤	④	③	②	①
6. I believe that the education received in higher education gives the individual a sufficient level of practice related to his/her profession.	⑤	④	③	②	①
7. I believe that higher education institutions are as concerned with the behavioral dimension of education as they are with the academic dimension.	⑤	④	③	②	①
8. I believe that higher education institutions offer high quality education.	⑤	④	③	②	①
9. I believe that higher education institutions are qualified to respond to the demands of individuals.	⑤	④	③	②	①
10. Today, I believe that higher education institutions are in sufficient cooperation with the business world.	⑤	④	③	②	①
11. I believe that higher education institutions develop their programs according to expectations to serve today's students' needs better.	⑤	④	③	②	①
12. I believe that higher education institutions are constantly improving themselves to serve today's students' needs better.	⑤	④	③	②	①
13. I believe that higher education institutions are changing to meet today's students' needs better.	⑤	④	③	②	①
14. I believe that higher education institutions will carry the country to better places in the future.	⑤	④	③	②	①

Appendix-2 Yükseköğretime Güven Ölçeği

Aşağıda yer alan ifadeleri sırayla okuduktan sonra, yükseköğretime duyulan güveni ölçmeyi amaçlayan maddelere ilişkin görüşlerinizi sağ tarafta yer alan uygun seçeneğe çarpı (x) işareti koyarak değerlendiriniz.	Kesinlikle katılıyorum	Katılıyorum	Fikrim yok	Katılmıyorum	Kesinlikle Katılmıyorum
1. Yükseköğretim kurumlarının mesleki program çeşitliliğinin yeterli düzeyde olduğuna inanırım.	⑤	④	③	②	①
2. Yükseköğretim kurumlarının çeşitli öğrenci aktivitelerini karşılamak için yeterli düzeyde sosyal imkanlara sahip olduğuna inanırım.	⑤	④	③	②	①
3. Günümüzde Yükseköğretim kurumlarının öğrencilerin iyi bir eğitim birikimine sahip olmasını sağladığına inanırım.	⑤	④	③	②	①
4. Yükseköğretim kurumlarında görev yapan yöneticilerin iyi bir eğitim için sürekli çaba gösterdiğine inanırım.	⑤	④	③	②	①
5. Yükseköğretim kurumlarında görev yapan akademik personelin iyi bir eğitim için sürekli çaba gösterdiğine inanırım.	⑤	④	③	②	①
6. Yükseköğretimde alınan eğitimin, bireye mesleğiyle ilgili yeterli düzeyde pratik kazandırdığına inanırım.	⑤	④	③	②	①
7. Yükseköğretim kurumlarının eğitimin akademik boyutuyla ilgilendiği kadar davranışsal boyutuyla da ilgilendiğine inanırım.	⑤	④	③	②	①
8. Yükseköğretim kurumlarının eğitimi yüksek kalitede sunduğuna inanırım.	⑤	④	③	②	①
9. Yükseköğretim kurumlarının bireylerin taleplerine cevap verecek nitelikte olduğuna inanırım.	⑤	④	③	②	①
10. Günümüzde yükseköğretim kurumlarının, iş dünyasıyla yeterli düzeyde iş birliği içerisinde olduğuna inanırım.	⑤	④	③	②	①
11. Yükseköğretim kurumlarının günümüz öğrenci ihtiyaçlarına daha iyi hizmet verebilmek için programlarını beklentilere göre geliştirdiğine inanırım.	⑤	④	③	②	①
12. Yükseköğretim kurumlarının günümüz öğrenci ihtiyaçlarına daha iyi hizmet verebilmek için kendini sürekli geliştirdiğine inanırım.	⑤	④	③	②	①
13. Yükseköğretim kurumlarının günümüz öğrenci ihtiyaçlarını daha iyi karşılamak için değişim gösterdiğine inanırım.	⑤	④	③	②	①
14. Yükseköğretim kurumlarının ülkeyi gelecekte iyi yerlere taşıyacağına inanırım.	⑤	④	③	②	①