Scale of Accountability in Higher Education Institutions: A Study of Validity and Reliability

Yükseköğretim Kurumlarında Hesap Verebilirlik Ölçeği: Geçerlik ve Güvenirlik Çalışması

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ABSTRACT

Despite being generally perceived as a phenomenon restricting freedoms, an ideal accountability behaviour is, actually, an important factor for the improvement of an organization. The aim of this study was to develop a scale that measures accountability in higher education institutions. For the generation of the scale items, the relevant literature was examined in detail both from national and international sources. The views of the academics (N=11) on accountability in higher education institutions were acquired, as well. The scale, whose content and language validity checks were performed, was applied to 200 academics, who worked at Turkish higher education institutions and were chosen through random sampling. As a result of the explanatory factor analysis, which was conducted to explore construct validity, 7 dimensions of the scale were identified. The confirmatory factor analysis which was conducted to check the accuracy of the identified structure showed that the model fit perfectly with that structure ($\chi2/df=1, 2$; RMESA=0.04; NNFI=.95; CFI=.95). The internal consistency of the scale as measured by Cronbach alpha coefficient was calculated as .94. Based on the findings, it can be said that a valid and reliable measurement instrument that measures accountability in higher education institutions was developed.

Keywords: Accountability, Higher education, Scale development, Explanatory factor analysis, Confirmatory factor analysis

ÖZ

Hesap verebilirlik kavramı genellikle özgürlükleri kısıtlayıcı bir olgu olarak algılansa da aslında ideal bir hesap verme davranışı örgütün gelişmesinde önemli bir etkendir. Bu araştırmanın amacı yükseköğretim kurumlarındaki hesap verebilirliği ölçen bir ölçme aracı geliştirmektir.

Ölçeğin maddeleri oluşturulurken yerli ve yabancı literatür detaylı bir şekilde incelenmiş ve yükseköğretim kurumlarında hesap verebilirlik ile ilgili akademisyenlerin (N=11) görüşleri alınmıştır. Kapsam ve dil geçerliliği yapılan ölçek, Türkiye'deki devlete ait yükseköğretim kurumlarında görev yapan rastgele örneklem yöntemiyle belirlenmiş 200 akademisyene uygulanmıştır. Ölçeğin yapı geçerliğini tespit etmek amacıyla yapılan açımlayıcı faktör analizi sonucunda 7 boyutlu bir yapı elde edilmiştir. Yapının doğruluğunu tespit etmek amacıyla yapılan doğrulayıcı faktör analizi sonucu modelin mükemmel bir uyum gösterdiğini ortaya koymuştur ($\chi2/df=1, 2$; RMESA=0.04; NNFI=.95; CFI=.95). Ölçeğin Cronbach alfa iç tutarlılık katsayısı .94'dür. Araştırma sonucunda yükseköğretim kurumlarında hesap verebilirliği ölçen geçerli ve güvenilir bir ölçme aracı geliştirildiği söylenebilir.

Anahtar Sözcükler: Hesap verebilirlik, Yükseköğretim, Ölçek geliştirme, Açımlayıcı faktör analizi, Doğrulayıcı faktör analizi

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INTRODUCTION

Accountability, one of the essential elements of a successful management, is currently accepted as an important principle to ensure the transparency in public enterprises. The concept of accountability in education was more frequently discussed after 1970's, it started to developed as a Standard based movement of accountability in 1980's; in 1994 with the law "The Improving America's Schools Act – IASA" the accountability system at the level of province was started to be discussed. Lately (2001) with the law of "No Child Left Behind" a more permanent accountability system was provided and a specific frame was presented to provinces to develop their own accountability systems. (Perie, Park & Klau, 2007).

Higher Education Institutions have a great impact on social, cultural and economic development of a region or a government. The common aim of these institutions is to develop human understanding. From this perspective, higher education serves as an intellectual and cultural source. With being on the agenda of the problem of quality in higher education institutions, the concept of accountability has become quite important. Public accountability has become an important principle especially in the universities abroad. Accountability generally became a topic for discussions in higher education institutions in Turkey but an applicable accountability system was not formed.

The growing demand for higher education led to a rapid increase in the number of universities in Turkey and this case brought up the problem of quality in higher education institutions. It is very important that the universities developing in terms of quantity should also develop in terms of quality and being close with public. This understanding made the concept of accountability a current issue in higher education institutions. Bologna process, which is going on to ensure the accountability and standardization in higher education institutions, is a very great step in this issue. The aim of this process, which 41 countries have attended, is bring the higher education systems of the countries to the transparent, understandable and competitive level. (Higher Education Council 2010).

When the national and international literature are studied, it could not be encountered with an scale whose validity and reliability are proven. In Some universities in developed countries, some types of forms have been used to prove the accountability of their own universities. The reason of this can be considered that the perceptions on accountability have changed and it is perceived as a concept closely related to culture of societies. While developing the accountability system, cultural and social elements should be taken into consideration (Lingenfelter, 2003: 21). It is not possible obtain statistic values determining the accountability level of these institutions, since there is no accountability scale in the higher education institutions in Turkey. A scale which measures accountability in higher education institutions will compensate this missing.

In this article, the concept of accountability has been analyzed, and the content and the subdimensions of accountability have been presented. For this, it is primarily necessary to analyze the concept of accountability and understand the content and subdimensions of accountability correctly. When the literature is studied, it is possible to encounter so many concepts about accountability. However, the concept of accountability becomes more specific, when it is studied in terms of higher education institutions. In the study, the classification about accountability in higher education institutions were carried by taking into consideration of higher education institutions and conditions in Turkey. For this reason, related literature was studied in a detailed manner and interviews were arranged with academicians in Turkey.

Definition of Accountability

Lexical meaning of the concept of accountability is: the quality or state of being accountable, and obligation or willingness to accept responsibility or to account for one's actions (Merriam-Webster's Dictionary of English usage, 1994). Evans (2008: 10) stated that accountability concept is misunderstood as if it had been a negative sanction for something going wrong. While accountability is perceived as a concept consisting only financial and highly important political activities in advance, current social changes have led to some conceptual shifts in the responsibility of accountability. Responsibility of accountability is no longer a phenomenon which is limited with time and place, and it has become a social and political concept thanks to developing media and growing public. From the point of public administration, as an important element in modern administration accountability can be defined as all administration, principles, supervision which are applied to guarantee that politicians should use sate resources and authority for the benefit of public (Behn, 2003: 11-12; Mulgan, 2002: 45).

The content of accountability concept

Accountability issue is a very complex and exhaustive concept (Aypay, 2015; Kearns, 1994: 141; Wagner, 1989: 7). When related literature is studied, accountability in higher education institutions can be evaluated as basic subdimensions such as academic accountability, administrative accountability, financial accountability, transparency, responsibility, responsiveness and explanation (Vidovich & Slee, 2001; Goetz & Jenkins, 2001; Lingenfelter, 2001; Mulgan, 2002; Evans, 2002; Leveille, 2006; Middaugh, 2007)

Academic accountability

Accountability in higher education institutions should not only deal with financial accountability and it should also involve academic accountability which includes the activities of faculty members such as making surveys, publishing the surveys, carrying out educational activities and servicing for public. Academicians who should have academic freedom should account for in terms of academic. Cahn (1983) stressed that academic freedom does not mean that they are out of control and throw off the responsibility of accountability. In addition to financial accountability, rectors, deans, high school managers and department heads in higher education institutions are able to account for academic performance of their departments (akt. Gedikoğlu, 2013).

Administrative accountability

Administrative accountability reminds the hierarchical structure of the organization in reality. Vidovich ve Slee (2001) divide accountability into four categories; upward, downward, inward and outward. These accountability types also make possible to communicate between administrators and superiors.

Upward accountability represents the conventional relation between subordinate and superior. Upward accountability involves procedural, bureaucratic, legal and vertical accountability.

Downward accountability is that an administrator in higher education includes his subordinate to decision process.

Inward accountability moves activities of superiors on occupational and ethical standards to the center. Accountability in universities and high schools is located in this class.

Outward accountability means that higher education institution are responsible for their customers, shareholders, supporters and public. Market and politic accountability are located in this class.

Responsibility

Responsibility of accountability in higher education institutions refer to accountability related that academicians and administrators carry out their occupational responsibilities. Accountability phenomenon lay responsibilities below for administrators (Burke, 2005):

- Managers should show that they use their power in right way.

- Managers should prove that they have responsibilities and effort to realize the objectives of their institutions

- Managers should report the performance of the institutions to public.

- Managers should evaluate the sources in terms of productivity and efficiency

- Managers should ensure the quality of the services that they presented to public and the programs that they applied.

- They should prove that they serve for public.

Responsibility means individual preference and activities oriented authority without one's reference. While accountability is for the others, responsibility is for one's own (Mulgan, 2003).

Financial accountability

Financial accountability is an obligation to present an exhaustive and honest report by persons who use public funding about planned and materialized usages. Financial accountability involves some financial systems for internal and external controlling and expense controlling of public institutions. Higher education institutions are high cost educational level and it is also an educational field where highly educated persons, qualified man power and experts and professionals are employed.

Therefore, it is necessary for these intuitions to have expensive infrastructure in addition to expensive machinery and equipment (Gedikoğlu, 2013). It is actually inescapable from accounting for public because of such an over coasting structure. Since higher education institutions have responsibility to account for government and public, they should use funds effectively and affordably and cooperate with shareholders. However, this is not an easy process. With the increasing demand for higher education recently, it is really hard to increase productivity while decreasing the cost. In this situation, deactivation accountability mechanism makes it complicated. Because an accountability system is an important tool for productivity and developing of the organization (Leveille, 2006).

Transparency

Transparency concept related to accountability concept is essentially whether every individual can reach accurate information. When accountability is studied in terms of transparency, it can be said that both concepts are related and complement each other (Eryılmaz & Biricikoğlu, 2011). Transparency frequently used with accountability concept involves the processes publishing and sharing the information about standard processes and regulations about working institutions by using an understandable language (OECD, 2002). Transparency is to share information about institution with shareholders in time, accurately and in an understandable way (Gedikoğlu, 2013). Providing accountability in higher education institutions depends on the creation of transparent policies in these institutions.

Responsiveness

Responsiveness is used to mean willingness of subordinates to meet the demand of superiors (Mulgan, 2003). Responsiveness which supports accountability involves that services standards in higher education initiations should be created sufficiently. In this context, higher education institution should have mechanisms answering demands and complaints of public to ensure accountability. On the other hand, responsiveness of higher education institutions is very important to strengthen the connection between public and these institutions.

Explanation

Explanation of higher education institutions for their activities to public is a reflection of social accountability which a kind of accountability emerging recently. Social accountability is very important recently. Developing information and communication technology enables that public more questions public institutions (Eryılmaz & Biricikoğlu, 2011). Accountability in higher education institutions should be for both persons working in institutions and public. Higher education institutions which are defined as semi- public institutions account for students, parents, industry and business world, professional organizations and public. Therefore, releasing to the public more concrete performance indicators like the number of students and personnel is very important for an ideal accountability for higher education institutions.

A successful accountability system is all purpose and multi-dimensional (Lingenfelter, 2001). This accountability responsibility should not only be in national level but also in international level (Stensaker & Harvey, 2011).

How can accountability system be created in higher education institutions?

Critical suggestions are presented in this literature field to create and make applicable an effective and functional accountability system which is going to solve most of the problems in higher education institutions (Behn, 2003; Burke, 2005; Bowen, 1974; Doğramacı, 2007; Leveille, 2006; Vidovich & Slee, 2001).

- Accountability is a must to get better results in higher education institutions, but applied accountability types generally is not going to be useful to enhance the performance. Therefore, there need for new approaches providing better results in accountability in higher education institutions.

- We may describe most of the applied accountability systems as complex, ineffective, rough, exaggerated. The systems, formed by reports prepared by using data which are misleading, hyperpolitical, and unsuccessful to answer the key questions never create effective results.

- There is need for an accountability mechanism which focuses on the priorities of the government and nation and compels both academicians and legislators to take responsibilities for their success.

- There is need for accountability which presents valid and reliable information to monitor objectives, results and problems, and prompts creativity, sources and will to enhance the performance.

- A functional accountability system should provide confidence rather than fear and motivate to reach higher objectives rather than adapting minimum regulatory principles.

- Accountability system should not be a tool to differentiate the problems and to postpone the solution of the problem. Then we cannot take risk to have lower expectations and standards in our higher education institutions.

- While a functional accountability mechanism in higher education institutions are respecting legal limits between educational managers and politicians and government and institutions, it should also be determined to enhance the performance.

- Accountability system should be appropriate for the competitive end different structure of the higher education institutions. This system should create new situations for perfectness in terms of the distinctive mission for all higher education institutions.

- Accountability system in higher education institutions; should give more importance to success in student learning and high quality in researches.

- An effective accountability system in higher education institutions should reduce the superficial comparisons and

gradation which increase unnecessary costs, compel some institutions to decrease academic standards and exclude the students who need more time and help to be successful.

- Accountability system in higher education should provide answers for shareholders, students, related citizens and legislators on the logical issues such as student learning, graduate rates, students' needs and costs.

METHOD

Participants

In this study, which is a kind of quantitive survey study, three different participant groups were used. The detailed information is indicated below. the content validity study of the scale was carried out by 5 academicians; two of them have administrative function in higher education institutions and three of them are experts in educational administration. The study of language validity which determines the appropriateness between the accountability scale in higher education institutions and Turkish grammar structure was carried out by two instructors who are experts in the field of Turkish Language and Literature. The study of structure validity and reliability of scale; were carried out on the academicians working in the state universities. In the sampling of this study, there are 200 academicians working at 30 different state universities in 2015 and then were chosen through random sampling. The age and seniority characteristics of the academicians participating the study are indicated at Table 1.

The sufficiency of the sampling group was determined through Kaiser- Meyer- Olkin (KMO) test and the test result is KMO=.91. This value is higher than .90, and this indicate that he extent of sampling is perfect Şencan, 2005). According to Kline (1994) for enough sampling extent., sampling number should be double amount of the number of items in the scale. According to Çokluk and colleagues (2010) when the assumptions on sampling extent are taken into consideration, extent of sampling is

Table 1: Demographical Characteristics of the Academicians Participating the Research

Characteristics		f	%
Age	23-27 aged	48	24
	28-32 aged	52	26
	33-37 aged	43	21, 5
	38-42 aged	21	10, 5
	43-47 aged	23	11, 5
	48 aged and above	13	6, 5
Title	Instructor	16	8
	Prelector	51	25, 5
	Research Assistant	53	26, 5
	Assistant Professor	61	30, 5
	Associate Professor	12	6
	Professor	7	2, 3
Total		200	100

enough if it corresponds at least two criteria existing in literature. When all these information is taken into consideration, it can be said that the sampling extent of this research is enough to develop the accountability scale in higher education institutions.

Constitution of Item Pool

Various activities should be carried out for a functional accountability mechanism in higher education institutions. Since the accountability mechanisms may change from country to country even from region to region, while the item pool was constituted, the interviews were arranged with the academicians who work at in higher education institutions in Turkey and have different titles and experiences. The data obtained from interviews were studied with content analysis and findings were used to constitute the item pool. Besides, national and international literature related to this subjects were studied in a detailed manner and the accountability policy in developed countries and accountability behaviors at successful universities were searched.

Language Validity Test

After scanning the related literature in a detailed manner, 70 items related to accountability were written down to constitute an item pool. Language validity studies of the items were carried out by two instructors who are expert in the field of

Turkish language and literature. Table 2 shows a part of form used to provide Turkish language validity of draft scale.

After proofreading by the experts, interviews were arranged with a vice dean and a faculty member who is an expert in the field of educational administration to evaluate each item separately to test content validity of survey. During interviews, 8 items which is evaluated as appropriate were deleted from applicant scale.

Content Validity Test

An application whose one part is presented below was carried out to test content validity of the scale by 3 persons; one of them is a vice dean who has also an administrative duty at the university and the other two are the experts in the field of educational administration. The items graded lower than 7 by the experts were deleted from scale since they are accepted as in appropriate. For this reason, the number of items deleted from scale is 8. after this process, by calculating Lawshe content factor, the number of items reduced from 65 to 57. In Table 3 shows a part of the form given to the experts to test content validity.

Lawshe Contet Velidity rates were calculated to test the content validity of scale. The grades obtained from experts' judgements were calculated with Lawshe's (1975) formule.

Table 2: Language and Meaning Validity Fidelity Form of Accountability Scale in Higher Education Institutions

ITEMS	1 2 3 4 5 6 7 8 9 10
A fair policy is followed in the process from the date of publishing academic personnel announcement to the date publishing the results in my university.	
The exam results of academic personnel recruitment are published on a transparent internet site.	
Academic personnel's annually report their academic activities at my university.	
In my university, the number of students experiencing lateral and vertical transfer is published on university web page.	
State that to what extent these items are appropriate for grammar and meaning. You can state from level 1 to level 10. State the necessary correction and circle the chosen level.	

Table 3: Content Validity Fidelity Form of Accountability Scale in Higher Education Institutions

ITEMS	1 2 3 4 5 6 7 8 9 10
A fair policy is followed in the process from the date of publishing academic personnel announcement to the date publishing the results in my university.	
The exam results of academic personnel recruitment are published on a transparent internet site.	
Academic personnel's annually report their academic activities at my university.	
In my university, the number of students experiencing lateral and vertical transfer is published on university web page.	
Grade items in terms of the accountability measurements capacity in higher education from level 1 to 10. Correct the necessary parts.	

$$\dot{I}GO = \cfrac{n_e \cfrac{N}{2}}{\cfrac{N}{2}}$$

N_e=Expert indicating the appropitareness of the item
N= Total Expert number

Lawshe contents factors of the research were calculated and eight items whose content factor rate is lower than .99 were deleted from draft scale. The content rates of the other 57 items are calculated as one. According to Lawshe the content factor should be at least , 99 in a research accompanied by five experts. Therefore, it can be said that it is appropriate for the remaining items to be in the scale.

The structure validity and reliability analyses of scale items are the other steps of the study and these steps were applied to 200 academicians working at state universities determined through random sampling. The scale applicant whose content validity was completed in five point Likert scale extending from "strongly disagree" to "strongly agree".

Data Collection

Testing form composed to collect data is gathered on the internet with a link which has an explanatory information. A link on which there is an accountability scale in higher education institutions was sent to the academicians working in higher education institutions. The number of academicians who answered the scale on the link is 200.

Data Analysis

The validity and reliability studies of the scale were applied to the data obtained from 200 academicians who filled the accountability scale higher education institutions. principal component analysis (exploratory factor analysis- EFA) was carried out through varimax rotation method to test the structural validity of accountability scale in higher education institutions. Factor loading in analysis determines as .30 and then confirmatory factor analysis (CFA) was carried out to test the accuracy of the exploratory factor analysis. In the research, confirmatory factor analysis was carried out by using LISREL packet program. The reliability of the scale was identified by calculating Cronbach Alpha internal contingency ratio.

FINDINGS

In this section, there are findings related to *the validity and reliability of accountability scale in higher education institutions*.

Findings of Validity

Before factor analysis which was carried out to reveal the factor loading and determine the structural validity of the scale, Kaiser-Meyer-Olkin (KMO) ratio (.91) and Barlett Sphericity p=0.000) test were applied to determine the appropriateness of the data obtained from scale. According to findings, these tests came to the opinion that sampling number is appropriate for making factor analysis.

It was seen that the core values of scale were gathered in 10 factors higher than 1 and variance ratio was explained as 73 %

as consequence of first EFA carried out to determine the structural validity of the scale. Afterwards one of the items which did not belong to any factors and had a relation over .85 with each other was deleted from scale and EFA was made again. A structure with 8 factors was obtained because of repeated EFA and it is determined that one factor is composed by only one item. This item also was deleted from the scale. 18 items were deleted from scale as consequence of repeated processes. After deleting the items, a 7-factored structure consisting of 39 items was obtained as consequence of repeated EFA. Factor loading of items are appropriate and factors explain the 62%of the total variance. Table 4 shows factor loading of 39 items in the scale.

Table 4 shows factor loading belonged to exploratory and confirmatory factor analyses and significance values (t) of expected factor loading in confirmatory factor analysis. When t values in the table were analyzed, it was understood that factor load belonged to the items were statistically significant. When Table 2 was analyzed, it is understood that factor loading of the first dimension consisting eight items varied between .57 and .79. factor loading of the second dimension consisting of eight items vary between .46 and .69. Factor loading of the third dimension consisting four items vary between .52 and .78. Factor loading of the fifth dimension consisting of five items vary between .43 and .80. factor loading of the sixth dimension consisting of six items vary between .42 and .70 and factor loading of the seventh dimension consisting of three items vary between .65 and .72. Table 5 shows the explanation variance rate of factors of scale obtained from exploratory factor analysis.

According to Table 5, factors belonged to the scale explain 62.86 % of total variance as consequence of exploratory factor analysis. This factor explains 13.16% of total variance. This dimension is called as *financial* since this factor is consisted of the items reflecting the financial dimension of accountability in higher education institutions. The second factor explains 10.79% of total variance. This dimension is called as *transparency* since this factor is consisted of the items reflecting the transparency in higher education institutions. The third factor explains 8.96% of total variance. This dimension is called as *responsibility* since this factor is consisted of the items expressing the responsibility of accountability of higher education institutions. The fourth factor explains 8.34% of total variance. This factor is called as *responsiveness* since the items in this factor are related responsiveness of higher education institution for public demands and requests. The fifth factor explains 8.30% of total variance. This factor is called as *administrative accountability* since the items belonged to this factor are related to administrative accountability of the institution. The sixth factor explains 7.67% of total variance. This factor is called as *academic accountability* since this factor is consisted of the items reflecting the academic accountability in higher education institutions. The seventh factor explains 5.61% of total variance. This dimension called as *explanation* since this factor is consisted of the items related to the concept of accountability for explanation for public in higher education institutions. In

Table 4: Factor Loading of Scale Items Obtained as Consequence of Exploratory Factor Analysis

	F1		F2		F3		F4		F5		F6		F7	t**
	EFA*		EFA*		EFA*		EFA*		EFA*		EFA*		AEFA*	
M16	.64													8.1
M18	.64													10.5
M21	.73													4.7
M22	.79													6.9
M23	.72													7.8
M24	.68													8.9
M25 M26	.72 .57													5.7
M1			.63											19, 1
M2			.60											5, 3
M9			.46											8, 4
M48			.46											8, 3
M49			.68											11, 3
M50			.69											8, 2
M51			.63											11, 9
M53			.57											9, 3
M44					.67									8.8
M45					.81									9, 8
M46					.87									13, 1
M47					.84									12, 1
M39							.57							11, 5
M40							.70							12, 0
M41							.62							12, 6
M42							.69							11.1
M43							.52							12, 0
M12									.43					11.6
M54									.75					4.2
M55									.80					11, 3
M56									.73					7, 8
M57									.76					9, 8
M3											.44			8, 3
M29											.44			8, 9
M30											.65			8, 9
M33											.70			17, 8
M34											.42			10, 8
M37											.42			12, 4
M4													.71	16, 7
M14													.65	16, 0
M15													.72	7, 6

*Factor load belonged to exploratory factor analysis
** t values of expected factor loading in confirmatory factor analysis

the analyses done with the same research group, the relation among the sub dimensions of the scale was studied and the correlation among the factors are indicated ate Table 6.

When Table 6 is analyzed, it is understood that all the factors have significant relation (p<.001) with each other.

Before giving the findings related to confirmatory factor analysis which was carried out to confirm the structural validity of scale, a short information about fit indices used in confirmatory factor analysis is presented in Table 7 (akt. Çokluk et al., 2010).

Table 8 shows findings obtained from confirmatory factor analysis. Table 8 shows that x-square value for fit indices scale related confirmatory factor analysis and statistical significance level [χ^2=788, 31 df= 640]. Depending on degree of freedom, low x square value (χ^2) proves that suggested model is appropriate for collected data. Fit ındices (χ^2/df=1, 2; RMESA=0.04; NNFI=.95; CFI=.95) obtained from confirmatory factor analysis belonged to accountability model in higher education institutions reveal that suggested model for scale has shown a perfect fit.

Table 5: Variance Results Obtained from Exploratory Factor Analysis

Dimensions	Core Values			Sum of Squares Consequence of Rotation		
	Total	Total Variance Rate	Totaled Percentages	Total	Total Variance Percentages	Totaled Percentages
Financial Accountability	13.6	34.96	34.96	5.13	13.16	13.16
Transparency	3.65	9.36	44.32	4.21	10.79	23.96
Responsibility	1.69	4.34	48.67	3.49	8.96	32.93
Verification	1.60	4.11	52.79	3.25	8.34	41.27
Administrative Accountability	1.40	3.59	56.38	3.32	8.30	49.57
Academic Accountability	1.30	3.33	59.72	2.99	7.67	57.24
Explanation	1.22	3.13	62.86	2.18	5.61	62,86

Table 6: Correlation Ratio among Factors

	F1	F2	F3	F4	F5	F6	F7
F1	1.00	.447**	.299**	.565**	.663**	.567**	.426**
F2		1.00	.558**	.631**	.519**	.625**	.451**
F3			1.00	.522**	.308**	.478**	.357**
F4				1.00	.596**	.667**	.444**
F5					1.00	.555**	.370**
F6						1.00	.463**
F7							1.00

**p<.001.

Table 7: Confirmatory Factor Analysis Fit Indice

Fit Indice	Criteria	Source
X^2	P>0.05	Tabachnick & Fidell, 2001
X^2/sd	< 2.5= perfect fit	Kline, 1994
RMSEA	<0.8= good fit	Hooper, Coughlan & Mullen, 2008
NNFI	>0.90= perfect fit	Tabachnick & Fidell, 2001
NFI	>0.90= perfect fit	Tabachnick & Fidell, 2001
CFI	>0.95= perfect fit	Tabachnick & Fidell, 2001

RMSEA: Root Mean square error of approximation, **NNFI:** N0n-Normed Fit Index, **Nfı:** Normed- Fit Index, **CFI:** Comparative Fit Index
Source: Çokluk, Ö. Şekercioğlu, G., & Büyüköztürk Ş. (2010). Sosyal bilimler için çok değişkenli istatistik SPSS ve Lisrel uygulamaları. Ankara: Pegem.

As understood also from Table 8, the accountability super-structure in higher education which is formed by the factors called academic accountability, transparency, responsibility, administrative accountability, responsiveness and financial accountability is confirmed a consequence of analysis. Fit indices of the model are on the perfect level.

Findings of Reliability

Cronbach Alpha ratio of 39 items and of each item were calculated to test reliability of scale. Table 8 indicates internal consistency ratio of items in scale. According to Table 9, internal consistency ratio of the 39 items in scale. The internal consistency ratio belonged to dimensions is as below. Cronbach Alpha ratio belonged to *financial accountability* dimension is .89, Cronbach Alpha ratio belonged to *transparency* dimension is .85, *Cronbach* Alpha ratio belonged to *responsibility* dimension is .90, Cronbach Alpha ratio belonged to *responsiveness* dimension is .85, Cronbach Alpha ratio belonged to *administrative accountability* dimension is .85, Cronbach Alpha ratio belonged to *academic accountability* dimension is .77, Cronbach Alpha ratio belonged to *explanation dimension* is .70.

According to the analyses carried out to test reliability of scale, Cronbach Alpha reliability ratio of scale and scale dimensions reveal that scale is quite reliable.

DISCUSSION and CONCLUSION

Although the concept of accountability in higher education institutions is perceived as financial accountability, it is more than this in reality. In fact, the institutions which give account for should be dealt with a multi-dimensional approach (Lingen-felter, 2001). When the successful universities in developed countries are studied, it is seen that these universities have a distinctive accountability mechanisms.

According to exploratory factor analysis carried out to determine the structural validity of accountability scale in higher education institutions, the structure consisting 7 sub dimensions and having 62% explained variance rate is obtained in the study. It is an acceptable criterion for multi-dimensional scales that explained variance rate of the structure is higher than 30% (Büyüköztürk, 2005). According to findings, variance rate explained by accountability scale in higher education institutions can be described as quite high. Therefore, the accountability scale in higher education institutions is able to measure the accountability in these institutions quite well.

Confirmatory factor analysis results carried out to determine the accuracy of the estimated model (the model was presented at appendix 1.) revealed that the estimated model had a perfect fit (χ^2/df=1, 2; RMESA=0.04; NNFI=.95; CFI=.95). The evidence of perfect fix is that rate of low x-square to degree of freedom is lower than 2 (Kline, 1994). The other fit indices obtained from confirmatory factor analysis also support the perfect fit (Brown, 2006: 84; Çokluk et al., 2010: 272).

Cronbach Alpha reliability ratio of sub dimensions of the scale which was analyzed through internal consistency method vary between .73 and .89. Cronbach alpha reliability ratio of all items in scale is .84. One of the important indicators which shows that the scale is reliable is 70 or higher reliability rate (Cronbach, 1951: 302). Findings obtained from reliability analyses have shown that the scale is quite reliable.

Table 8: Confirmatory Factor Analysis Results related to Accountability Scale in Higher Education Institutions

Fit Indice	Criteria	Fit Level
X^2	χ^2=788, 31	
X^2/sd	788, 31/640=1, 2	Perfect Fit
RMSEA	0.04	Perfect Fit
NNFI	0.95	Perfect Fit
CFI	0.95	Perfect Fit

Table 9: The Number of Items of Sub-dimensions of Accountability in Higher Education Institutions and Cronbach Alpha Internal Consistency Ratio

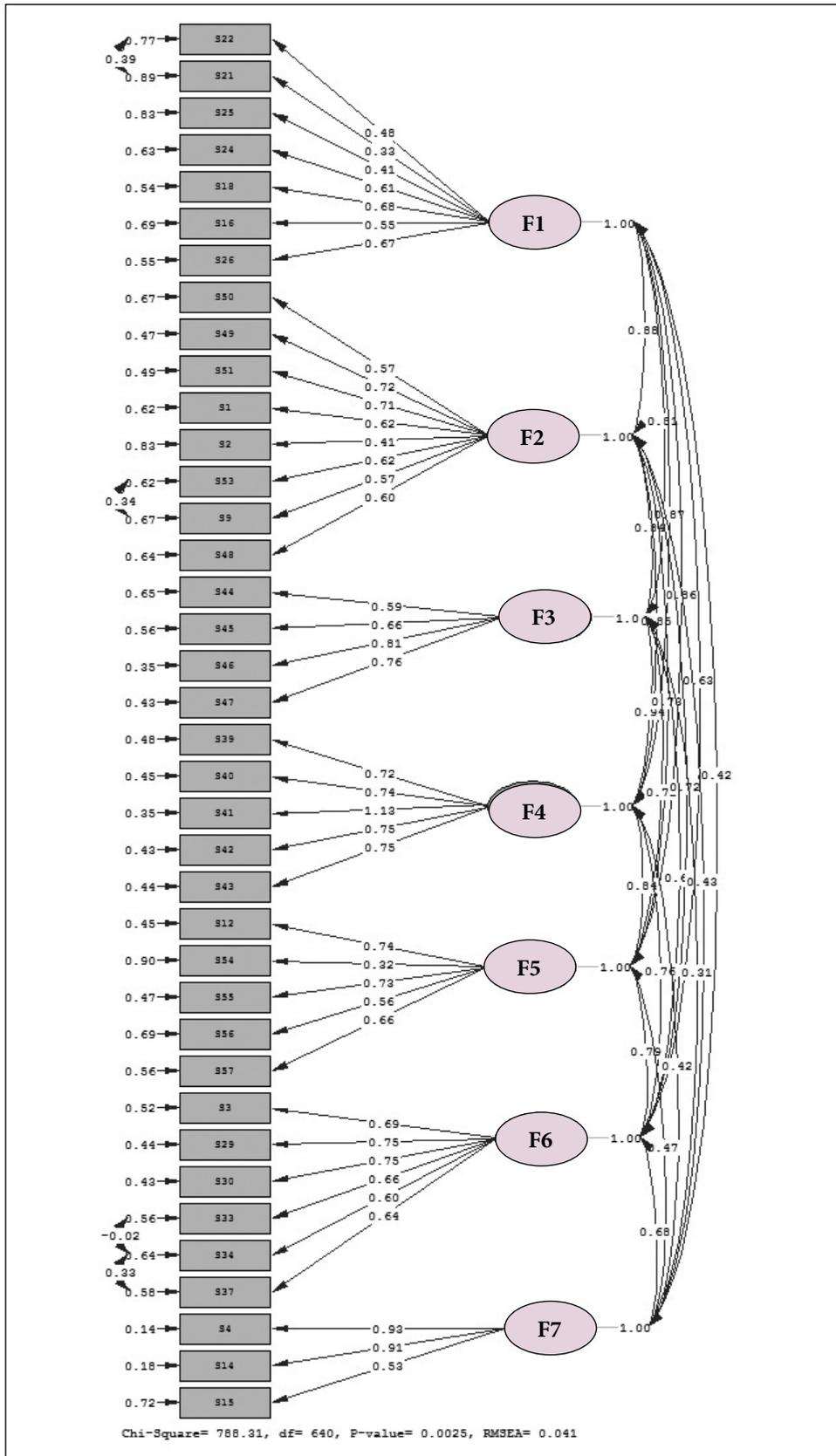| Dimensions	The number of items	Cronbach Alpha Ratio
Financial Accountability	8	.89
Transparency	8	.85
Responsibility	4	.90
Responsiveness	5	.85
Administrative Accountability	5	.85
Academic Accountability	6	.77
Explanation	3	.70
Total	39	**.94**

According to all findings obtained from the study of validity and reliability of *The Accountability Scale in Higher Education Institutions,* this scale can be used as valid and reliable to evaluate the accountability in higher education institutions.

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AP 1:

Obtained model from confirmatory factor analysis

Chi-Square= 788.31, df= 640, P-value= 0.0025, RMSEA= 0.041

AP 2:
Concept Map of Accountability in Higher Education Institutions

Concept Map of Accountability in Higher Education Institutions

Accountability in Higher Education Institutions

Verification (Acar, 2002)
- academic accountability
- administrative accountability
- finacial accountability
- Transparency

Responsibilty (Mulgan, 2000)

Academic Accountability (Walcott, 2013)
- obedience to rule
- proffesional accountability
  - Dependence on professional norms
- performance assesment
  - educational activity
  - productivity
  - effectiveness

Financial Accountability
- using public funds
- using budget

Responsivenes (Samsun, 2003)
- complaint mechanism
- supervison and control
- responsiveness to demand and requests

Administrative (Hierachical) (Cendon, 1999)
- use of power
  - bureauctatic (Burke, 2005)
- effectiveness of operational activities
  - fair and equal behavior

Explanation (Kantos, 2011)
- transferring institutional iformation publishing on the website
- the number of graduate and undergraduate students
- the b-number of lateral transfer students
- the number of graduate