Üniversite Araştırmaları Dergisi, 2024, Cilt 7, Sayı 3, Sayfa: 296-304
Journal of University Research, 2024, Volume 7, Issue 3, Page: 296-304

Araştırma Makalesi
Research Article

The Adoption of Holacracy in Higher Education: A Scale Development Study

Holakrasinin Yükseköğretimde Benimsenme Düzeyi: Bir Ölçek Geliştirme Çalışması

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Abstract: This study aims to develop a valid, reliable, and convenient data collection tool to measure the level of faculty members' adoption of the holacracy model in university administration. The data of this study were obtained from faculty members working in the faculties of education of state universities in Türkiye in the 2020-2021 academic year. Participation in the study was completely voluntary. The data were collected from a sample of 268 people. Within the scope of the research, the Higher Education Holacracy Scale (HEHS) was used as a data collection tool. The researcher developed the draft form of the HEHS in line with the literature on holacracy. The draft form was presented to 14 experts, one of whom was an expert in measurement and evaluation. Thus, the content validity of the research was ensured. As a result of the analyses, it was determined that the variance explained was 63.228%, the structure consisted of three components, and the fit index values were at a good level. Exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were conducted for the validity of the scale, and Cronbach's Alpha coefficient was calculated for reliability. Item-total correlations examined the discrimination of the scale items. After the analyses, it was determined that this 25-item scale, which is in harmony with its theoretical foundations, is a valid and reliable scale suitable for measuring faculty members' opinions.

Keywords: Higher Education, Holacracy, Scale Development, Validity, Reliability

Özet: Bu araştırmanın amacı, öğretim elemanlarının üniversite yönetiminde holakrasi modelini benimseme düzeylerini ölçmek için geçerli, güvenilir ve elverişli bir veri toplama aracı geliştirmektir. Bu araştırmanın verileri 2020-2021 eğitim-öğretim yılında Türkiye'deki devlet üniversitelerinin eğitim fakültelerinde görev yapan öğretim elemanlarından elde edilmiştir. Araştırmaya katılım tamamen gönüllülük esasına dayalıdır. Elde edilen veriler, 268 kişiden oluşan örneklemden toplanmıştır. Araştırma kapsamında veri toplama aracı olarak Yükseköğretimde Holakrasi Ölçeği (YHÖ) kullanılmıştır. YHÖ' nün taslak formu holakrasiye ilişkin literatür doğrultusunda araştırmacı tarafından geliştirilmiştir. Taslak form, biri ölçme değerlendirme alanında uzman olmak üzere 14 farklı uzmanın görüşüne sunulmuştur. Böylelikle araştırmanın kapsam geçerliği sağlanmıştır. Yapılan analizler sonucunda, açıklanan varyansın %63,228 olduğu ve yapının üç bileşenden oluştuğu tespit edilmiş olup uyum indeks değerlerinin iyi düzeyde olduğu ortaya konulmuştur. Ölçeğin geçerliği için açımlayıcı faktör analizi (AFA) ve doğrulayıcı faktör analizi (DFA) yapılmış, güvenirliği için ise Cronbach's Alpha katsayısı hesaplanmıştır. Ölçek maddelerinin ayırt ediciliği ise madde toplam korelasyonları ile incelenmiştir. Analizlerin ardından kuramsal temelleriyle uyum içinde olan 25 maddelik bu ölçeğin öğretim elemanlarının görüşlerini ölçmede kullanılmak için uygun, geçerli ve güvenilir bir ölçek olduğu saptanmıştır.

Anahtar Kelimeler: Yükseköğretim, Holakrasi, Ölçek Geliştirme, Geçerlik, Güvenirlik

1. Introduction

In today's agile world, the existence and necessity of change is frequently expressed. Fierce competition and rapid change, especially in organizations, require organic and flexible organisational agility (Chen, 2017), and managers and the traditional pyramid organisational structure are being questioned (Vakil, 2018). Today, in the United States and many countries in Europe, it is relatively more likely to find hierarchy-free organisations (Pircher, 2017). On the other hand, it is inevitable that universities, which are one of the oldest organizational structures that have gone through many difficulties (Ortaş, 2004) to produce and disseminate knowledge independently of authority from the past to the present, will also be searching for new challenges. It is stated that the

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Geliş Tarihi / *Received Date*: 27.05.2024
Revizyon Talebi Tarihi / *Revision Request Date*: 27.06.2024
Son Revizyonun Geliş Tarihi / *Last Revised Version Received Date*: 03.07.2024
Revizyon Sonrası Kabul Tarihi / *Accepted After Revision Date*: 11.07.2024

https://doi.org/10.32329/uad.1490403

traditional type of university model has lost its validity and it has become imperative for universities to keep pace with change (Ergüder, Şahin, Terzioğlu & Vardar, 2006). However, universities are fully democratic institutions and offer each individual the opportunity to express themselves freely in an environment of mutual debate (Ortaş, 2004). In Türkiye, they are gathered under the Council of Higher Education (YÖK) umbrella. In this context, it is argued that YÖK does not allow the development of an autonomous university consciousness (Ortaş, 2008) and that it makes university administrations bureaucratic and cumbersome (Yılmaz & Cömert, 2011). The management system chosen for universities, whose primary mission is teaching and research, is expected to make these activities as efficient as possible (Rosovsky, 2017). On the other hand, universities should be transformed into autonomous structures that can participate in research, education, training and service provision (Gül & Gül, 2015). For this reason, it may be considered appropriate to try new management structures for universities, which are loosely structured systems. One of these is holacracy.

Holacracy was first introduced as a concept by Brian Robertson in 2007 (Bernstein, Bunch, Canner & Lee, 2016; HolacracyOne, 2013). The "Holacracy Constitution" was then prepared as a guide for practitioners, including the structure, processes and basic principles of the system (HolacracyOne, 2013). Robertson (2015a) defines holacracy as a "social technology" tested in the real world to create an agile and purpose-driven organization. According to another definition, holacracy is a globally tested approach to structuring, managing and operating a purpose-driven, agile organization (Röll, 2014). Graham (2010) defines holacracy as an advanced organizational management system designed to harness collective wisdom in goal-oriented organizations and has roots in sociocracy, agile software methods and other systems. Collins and Hines (2010) say that holacracy replaces hierarchy with self-organising circles that are more natural and organic. It is also argued that holacracy radically changed the way the organization is structured, how power is distributed and how decisions are made (Holacracy™, 2022). Indeed, this approach creates an organization in which the organizational structure continuously evolves while providing more openness, autonomy and empowerment to employees (Röll, 2014). On the other hand, in organizations that apply the model, leadership is not seen as a personal trait. Instead, leadership is available to anyone who chooses to act in the interests of the organization (Vakil, 2018). In this structure, titles such as supervisor, manager, and director are replaced by the "team leader", who provides guidance to the employees and is not involved in role distribution and assignment processes (Robertson, 2015b). Moreover, each organizational employee assumes more than one role and can leave this role(s) at any time, provided the team leader is notified in advance. On the other hand Noguchi (2015) states that in many organizations implementing holacracy, workers are not told how to do their jobs, but are expected to be connected to circles in the organization that help them examine problems or new ideas, as well as reward and evaluate each other. Turpçu and Aydın (2024) also state that the implementation of the holacracy model in university administrations of faculty members' equipped with academic freedoms can have positive effects on both the university and university administrations. In this direction, it can be said that holacracy encourages employees to be creative and produce innovation. In the literature review conducted within the scope of the study, there is not any measurement tool which aims to measure the opinions of faculty members at both international and national levels regarding the level of adoption of the holacracy model in university administration. In this framework, the study is thought to be the first of its kind and will make a unique contribution to the field.

The purpose of this study is to test the validity and reliability of the HEHS, which was designed to determine the level of adoption of the holacracy model in university administration according to the opinions of the faculty members'. In this context, answers to the following questions were sought:

1. Is the HEHS a valid data collection tool?

2. Is the HEHS a reliable measurement tool?

2. Method

This study was conducted to develop a scale suitable for determining faculty member's views on the level of adoption of the holacracy model in university administration. The study, which is quantitative research, was designed in a correlational survey design. All data were collected, analyzed, and interpreted accordingly. Descriptive survey model was used within the scope of the study.

2.1. Study Group

The participants were randomly selected based on volunteerism. The study group of the research consisted of faculty members working in the education faculties of state universities in Türkiye. The personal information of the faculty members (university, name-surname, e-mail address, etc.) was accessed through "Higher Education Academic Search (YÖKAKADEMİK)". The scales, which were transferred to Google Forms, were sent to the participants' academic e-mail addresses with a written ethics committee approval document. The data were collected by answering the scale questions online after the participants were briefly informed about the scales and the study in the first part of the form, and their consent was obtained. The average response time for the scale questions was 12-15 minutes.

Different authors have different criteria regarding the ideal sample size for the validity and reliability analyses of the scale development process. While some authors state that a sample size of 300 would be pretty comfortable for factor analysis (Tabachnick & Fidell, 2013), others state that a sample size of 200 would be sufficient (Comrey & Lee, 1992; cited in Tabachnick & Fidel, 2013, p.613). The sample size depends on the number of items in the scale as a relative criterion. Kline (2014), who argued that the sample size depends on the number of items in the scale as a relative criterion, stated that three times the number of items in the scale should be reached; Nunnaly (1978) stated that 10 times the number of items in the scale should be reached (Cited in Akbaş, Karabay, Yıldırım-Seheryeli; Ayaz & Demir, 2019). In this study, reaching five times the number of scale items was taken as a criterion, and this target was reached with 268 participants for the 47-item HEHS sent to 3986 participants. Thus, it was seen that the desired sample size ratio for factor analysis was reached to a reasonable extent for both criteria.

2.2. Data Collection Tool

This study aimed to develop a reliable and valid scale to determine the level of faculty members' adoption of the holacracy model in university administration. For this purpose, the literature was first reviewed (Archer, Forrester-Wilson ve Muirhead, 2016; Eremina, 2017; Fowler, 2018; O'Shea, 2016; Robertson, 2006, 2007; Viðarsson, 2017). It was found in the literature review that there was not a measurement tool regarding holacracy model in university administration. After establishing the conceptual framework through a literature review, the researcher created an item pool consisting of 87 items. Then, the items in the item pool were re-examined by the researcher and thesis advisor and, some of the conceptually repetitive items were eliminated and the number of items in the scale was reduced to 52.

To determine the scope and content validity of the draft measurement tool form, it was presented to 14 experts, 13 of whom were in the field of educational administration and one of whom was in the field of measurement and evaluation. The experts were asked to give their opinions on whether the items in the draft scale form reflected the relevant construct and suggest corrections, if any. Based on the experts' opinions, 5 items were removed, and finally, a form consisting of 47 items was obtained. The draft version of the HEHS was a five-point Likert-type scale, scaled as "(1) Never Adopted, (2) Little Adopted, (3) Average Level Adopted, (4) Highly Adopted, (5) Completely Adopted. In this form, the draft form was made ready for pre-application.

2.3. Data Collection and Analysis

EFA and CFA were conducted to determine the scale's validity, and Cronbach's Alpha coefficient was calculated to determine its reliability. In the study, the criterion that each observed variable should have a factor loading of at least .70 was considered (Hair, Black, Babin & Anderson, 2010). At the same time, the criterion of .30 and above in the interpretation of item-total correlations was also met (Büyüköztürk, 2015). In the study, EFA was conducted using SPSS (Statistical Package Program for Social Sciences) and CFA was conducted using AMOS.

3. Findings

The study reviewed whether the HEHS is a valid measurement tool to measure the level of faculty members' adoption of the holacracy model in university administration based on their views. After the validity analysis, it examined whether the scale was a reliable measurement tool.

3.1. Findings for Validity Analysis

First, EFA was conducted with the data set collected from the participants with the HEHS. The suitability for EFA was tested with the Kaiser-Meyer-Olkin (KMO-MSA) sampling adequacy test, and the KMO-MSA value was calculated as .957. Since the KMO value is close to 1, the current scale is highly used to measure the phenomenon. (Özdamar, 2017) and the suitability of the sample size for factor analysis was determined to be excellent. The result of Barlett's Test of Sphericity, which is used for multivariate normality control, is significant at the level of $\chi^{2(595)}$=6391,267, p< .05 and the correlation matrix is not a unit matrix (Karaman, 2015) was determined. In line with these results, it was concluded that the data set was suitable for EFA.

In this study, *Principal Component Analysis (PCA)*, one of the factor extraction methods was used. The variance ratios and factor eigenvalues were reviewed to determine the number of factors of the draft scale. However, while deciding the number of factors, the scree plot was also examined in addition to the eigenvalue, and the contribution of the factors to the explained variance was measured (Can, 2014; Pituch & Stevens, 2015). The scree plot of the HEHS is given in ▶**Figure 1**.

While analysing the scree plot in ▶**Figure 1**, it was taken into account that the point of rapid decline with high acceleration indicates the number of important factors and the intervals between the two points indicate one factor (Çokluk, Şekercioğlu & Büyüköztürk, 2014; Seçer, 2013). In this framework, the analyses showed that the scale had a single-factor three-component structure. On the other hand, the distribution of the items to the factors was determined by the Equamax orthogonal rotation method. This method was preferred because

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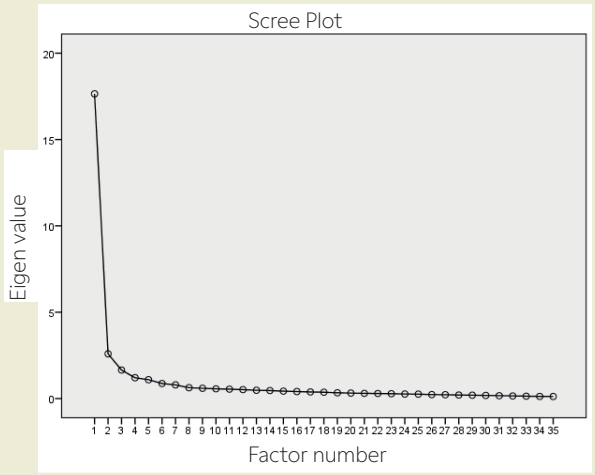

Figure 1. HEHS Scree Plot

the correlations between the factors were high, and the items had similar structures. In the rotation process, factors with eigenvalues ≥1 and items with item loadings of .32 and above were taken as basis (Büyüköztürk, 2015; Çokluk et al., 2014; Tabachnick & Fidell, 2013). An item with a load value difference of less than .10 is considered to be overlapping (Seçer, 2013). Accordingly, six overlapping items that would not cause any loss in scope were removed from the scale, and the analysis continued with 29 items. After repeated analyses, EFA results are given in ▶**Table 1**.

Table 1 shows that after the EFA was repeated, the HEHS consisted of 29 items and three components. According to this, the first component: "General Principles of Holacracy", which consisted of 17 items, explained 49.691% of the total variance, and the factor loadings ranged between .573-.725. Second component: "Organizing and Working in Circles", which consisted of six items, explains 8.423% of the total variance and the factor loadings varied between .538-.827. Finally, the third component, "Defining Roles at the Workplace," had six items, explained 5.114% of the total variance, and the factor loadings varied between .497-.840. Finally, the variance explained by the three components together was 63.228%.

As seen in ▶**Table 1**, item-total correlations were also calculated to determine the discriminative power of the items in the HEHS. Accordingly, item-total correlations ranged between .569 and .808 and the criterion of .30 and above was met in interpreting the correlations. In this direction, it was seen that the HEHS consisted of items that distinguished the trait to be measured. (Büyüköztürk, 2015).

CFA is a factor analysis used to test whether the factor structure revealed by EFA is compatible with the factor structures obtained with the research hypothesis (Öngen, 2010). It is stated that conducting CFA in the deductive approach and EFA in the inductive approach together will support the development of scales with vital theoretical aspects (Okur & Yalçın-Özdilek, 2012). For this reason, a first level confirmatory factor analysis was conducted within the scope of the study. The appropriateness of the model tested with CFA was reviewed by considering the fit indices. In this context, skewness and kurtosis values, among the normality assumptions, were reviewed. Since the skewness and kurtosis coefficients were found to be between +1.5 and -1.5 (Tabachnick & Fidell, 2013) it was concluded that the data set was normally distributed and then CFA was applied. The prerequisite that each observed variable should have a factor loading of at least .70 was observed (Hair et al., 2010). This study preferred Maximum Likelihood (ML) as the estimation method. In the model with 29 observed variables, three latent variables, there are 32 data for each observed variable.

After the analysis, the results of the measurement model for the measurement variables were reviewed and it was seen that there were six items with factor loadings lower than .70. One of these items had a high error variance and this would negatively affect the explanatory power of the item (Canaslan & Güçlü, 2020) was determined. For this reason, after reviewing the theoretical aspects of the related items, it was decided to keep two items in the scale. The other four items were removed from the model due to both decreasing the model fit values and having low factor loadings, and then the measurement was repeated. Since the factor loading values met the .70 criterion in the renewed measurement results, the model fit values were started to be examined.

The study reviewed CMIN/df, RMSEA, RMR, GFI, CFI, ILI and TLI. After the analysis, the goodness of fit values were CMIN/df= 2.269, RMSEA: 0.075, RMR: 0.055, GFI: 0.807, CFI: 0.917, IFI: 0.918 and TLI: 0.909. It was determined that the model goodness of fit values were not within the desired limits and the factor structure of the model did not fit well with the pre-application data. For this reason, the standardised residual matrix of the model was first reviewed to identify the variable that disrupted the structure of the model. However, it was observed that there was no variable in the matrix that violated the model fit by exceeding the cut-off point of 2.58. It is also stated that this situation can be shown as evidence that the model is correct (Bozoklu & Ermeç, 2020). For this reason, modification indices were also reviewed. As a result, it was determined that some items were close to each other in terms of theoretical significance and negatively affected the model goodness-of-fit indices. At this point, it is recommended to remove one of the item pairs from the model (Büyüköztürk, Akgün, Kahveci & Demirel, 2004).

The analysis was modified in the study by adding high error correlations between items to the model. During the modifications, the purpose of the related model and

Table 1. HEHS Principal Component Analysis Results

Item No.	Component 1: General Principles of Holacracy	Component 1	Component 2	Component 3	Item Total Correlation
33	Each team leader at the university is responsible for appointing the members who will assume the roles in the circle and the team leaders of the sub-circles reporting to them	,725			,713
38	Each team leader at the university is obliged to temporarily assume the vacant role(s) in their team	,717			,734
44	Discussing every problem felt by the faculty members in tactical meetings with a solution proposal	,716			,771
35	Each team leader at the university sets priorities and strategies for their circle	,715			,765
32	Faculty members are responsible for recognizing the problems related to their role/roles and following up to ensure that they are resolved	,709			,804
24	Defining each job at the university as a separate "role"	,682			,808
22	Election of the core members of the circles at the university by the circle members for a certain period	,666			,737
21	Each circle in the university has some basic members such as team leader, facilitator, representative and secretary	,663			,774
34	Each team leader in the university should observe the principle of voluntee-rism in distributing roles to faculty members.	,658			,721
37	Each team leader at the university is responsible for allocating the necessary resources to the members of their circle	,653			,770
31	Faculty members can, where necessary, appoint substitutes to fill their roles temporarily	,651			,655
45	Members participating in tactical meetings can present their objections to the solution proposals presented by the faculty members	,647			,716
18	The purpose of each circle in the university is determined by a higher circle to which it is connected	,627			,677
26	Transforming all administrative titles in the university into the role of "team leader" guiding the circles (such as the role of X Faculty Circle Team leader instead of the Dean's office)	,627			,777
28	All decisions regarding the organisational structure of the university (creating/removing or changing roles) are made in "governance" meetings	,615			,773
25	University staff assuming "roles" in the university instead of positions or offices (such as the "X-Circle of the "University Accounting role" instead of the position of the Accounting Treasurer)	,593			,754
30	Faculty members can leave their roles at any time by notifying the team leader	,573			,704
Eigenvalue: 14.41, Variance Explained: 49.691%, Cronbach's Alpha: .959					

Item No.	Component 2: Organizing and Working in Circles		Component 2	Component 3	Item Total Correlation
9	The organizational structure consists of structures called "circles" instead of units such as deanships or departments (such as the Faculty of Education circle)		,827		,797
10	The autonomy of each circle in the university to make its own decisions		,794		,750
8	Structuring the units in the university not in a hierarchical manner, but in a series of "circles" formed by bringing together similar and related roles		,767		,667
3	Ability to establish or abolish new circle structures as the needs of the university change		,710		,787
12	Each circle in the university is accountable for its own decisions and practices.		,636		,705
17	The university rector is the team leader of the university general circle		,538		,574
Eigenvalue: 2.443, Variance Explained: 8.423%, Cronbach's Alpha: .890					
	Component 3: Defining Roles in Place of Work				
3	Informing the teaching staff in a timely and accurate manner on all matters related to the functioning of the university			,840	,750
2	Notifying all employees of the rules determined at the university			,825	,684
1	Written rules that apply to everyone working at the university			,813	,722
4	Notifying everyone of all changes at the university through the fastest channels			,812	,709
5	Giving faculty members autonomy to the extent of their responsibilities in their work			,518	,573
7	Encouraging faculty members to put forward their ideas about their work			,497	,569
Eigenvalue: 1.483, Variance Explained: 5.114%, Cronbach's Alpha: .869					
Scale Total; KMO=0.952, Bartlett's Test Statistic= 4895.062, p<0.001, Explained variance: 63.228%, Cronbach's Alpha: .962					

https://doi.org/10.32329/uad.1490403

the theory were followed (Bayram, 2010). High contribution to the model in terms of chi-square (Çokluk et al., 2014) and the CFA was renewed by making modifications between the items in the same latent variable respectively. The path diagram of the modified first-order CFA results is given in ▶**Figure 2** and the fit index values are given in ▶**Table 2**.

As seen in ▶**Table 2**, after the relevant modifications, the model was found to have an excellent fit with CMIN/df=1.713, RMR=0.048, CFI=0.954 and IFI=0.955, and acceptable fit level with RMSEA=0.056 and TLI=0.949 (Schermelleh-Engel, Moosbrugger & Müller, 2003). On the other hand, due to the complex structure of the model, it is stated that the RMSEA value in the range of 0.05-0.08 can also be shown as an acceptable fit (Büyüköztürk et al., 2004).

However, it is stated that when the AGFI value is higher than 0.80 and the GFI value is higher than 0.85, it can be expressed as an acceptable fit (Marsh, Balla & McDonald, 1988). Therefore, the fit index values indicate that the theoretical basis of the scale is strong and the one-factor three-component model fits the data well (Şimşek, 2020).

As a result, in line with the exploratory and confirmatory factor analyses, it is possible to state that the construct validity of the HEHS, which consists of a single factor, three components and 25 items, was confirmed with the data obtained from the instructors; and that it is a reliable scale in line with the information provided regarding Cronbach Alpha coefficients and item-total correlations.

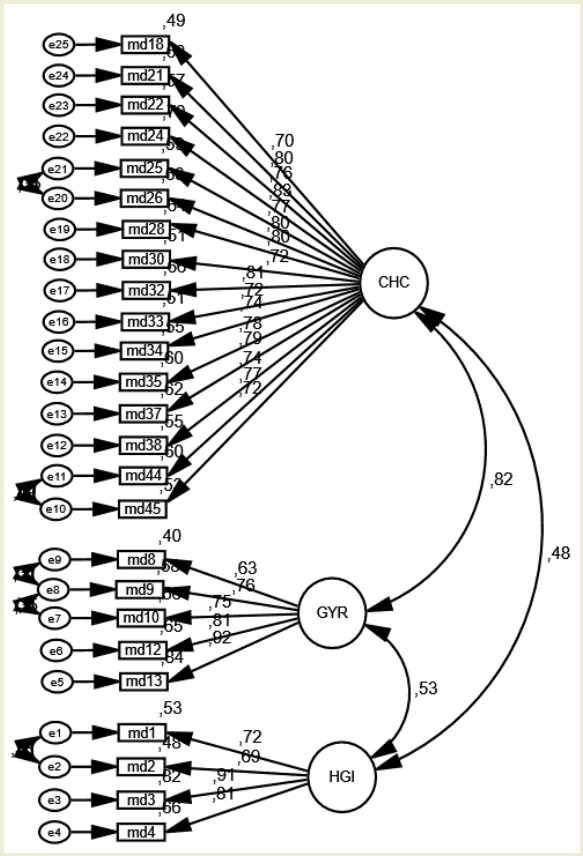

Figure 2. First Level CFA Model of Holacracy in Higher Education Scale

3.2. Findings for Reliability Analysis

The reliability of the HEHS was tested with Cronbach's alpha reliability coefficient, and the results obtained are given in ▶**Table 3**.

When ▶**Table 3** is reviewed, it is seen that Cronbach's Alpha reliability coefficient is calculated as .959 for the *general principles of holacracy* component, .890 for the *organizing and working in circles* component, .869 for the *defining roles instead of tasks* component and .962 for the scale. It is stated that a Cronbach's Alpha reliability coefficient in the range of >.70-.80 is acceptable (George & Mallery, 2003). In this direction, it can be

Table 2. Post-Modification Model Goodness-of-Fit Indices and Model Related Values

Index of fit	Perfect Fit	Acceptable Compliance	Model Related Values	Model Fit
CMIN/df	0 ≤ χ2/sd ≤ 3	3.00 ≤ χ 2 /sd ≤ 5.00	1,713	Perfect Fit
RMSEA	0 ≤RMSEA≤ .05	0.05≤ RMSEA ≤ 0.08	0,056	Acceptable Compliance
RMR	0.00≤ RMR ≤ 0.05	0.05≤ RMR ≤ 0.08	0.048	Perfect Fit
GFI	.91 ≤ GFI ≤1.00	0.80≤GFI≤0.89	0,851*	Acceptable Compliance
AGFI	.90 ≤ AGFI ≤1.00	0.80≤AGFI≤0.90	0,818*	Acceptable Compliance
CFI	.95 ≤ CFI ≤1.00	0.90≤ CFI ≤ 0.95	0,954	Perfect Fit
IFI	.95 ≤IFI ≤ 1.00	.90 ≤IFI ≤ .95	0,955	Perfect Fit
TLI	.95 ≤TLI ≤ 1.00	.90 ≤TLI ≤ .95	0,949	Acceptable Compliance

Source. Büyüköztürk et al., 2004, Hu and Bentler, 1999, Marsh, Balla and McDonald, 1998, Schermelleh-Engel and Moosbrugger, 2003, Marsh et al., 1988

Table 3. HEHS Reliability Analysis

Scale and Components	Number of participants	Number of items	Cronbach's Alpha Value
General Principles of Holacracy	268	17	.959
Organizing and Working in Circles		6	.890
Defining Roles at the Workplace		6	.869
Total of HEHSs		29	.962

stated that the reliability coefficient for the whole HEHS is at an excellent level and the scale's internal consistency is high.

On the other hand, whether the scale is additive or not was tested with Tukey's Test for Nonadditivity and the probability of Nonadditivity was calculated as P=.394. Accordingly, it was concluded that the scale items were additive (Tukey's Additivity Test, F= .728, p<.05), and the items in the scale consisted of homogeneous and related questions (F46,1=23,955, p< 0.05). In addition, whether the scale item averages were equal to each other was tested with Hotelling T^2 test (Özdamar, 2017) and this value was found to be significant at p<.05 level. As a result, it can be stated that the scale can measure phenomena with two or more sub-dimensions.

4. Discussion, Conclusion and Recommendations

This study was conducted to develop a valid and reliable measurement tool to measure faculty members' adoption of the holacracy model in university administration. For this purpose, the opinions of 268 volunteer faculty members were taken. Expert opinion was consulted for the content and face validity of the HEHS. Based on the opinions and suggestions of the experts, the draft form was organized as a 47-item scale. In this form, the draft form was made ready for pre-application. After the pre-application, normality assumptions (missing data, box-plot, Normal Q-Q Plot, histogram plots, Mahalonobis distance, skewness and kurtosis values, Kolmogorov-Smirmov test and multicollinearity problem) were reviewed for EFA and CFA. The 12 items found to have multicollinearity problems were removed from the scale. As a result, the data set consisting of 35 items and 225 observation units was made ready for EFA by ensuring normality assumptions. Six items found to be overlapping in the scale, the validity of which was examined with EFA, were removed from the scale respectively.

Item-total correlations were reviewed to determine the discrimination of the scale items. The whole scale consists of positive statements. Cronbach's Alpha coefficient was used to determine the internal consistency of the total scale and its components. The high Cronbach's Alpha coefficients of the scale components (general principles of holacracy=.959, organizing and working in circles=.890, defining roles instead of tasks=.869) confirm that the items in the components are consistent with each other. It is seen that EFA and CFA results prove the validity of the scale.

The HEHS is a 25-item 5 point likert type measurement tool consisting of a single factor and three components aiming to measure the level of adoption of holacracy in university administration according to the opinions of faculty members. The general principles of the holacracy dimension measure the level of faculty members' adoption of the general principles of the holacracy model. There are four items in this subcomponent, and a high score indicates that the adoption of general principles of holacracy is high. The component of organizing and working in circles measures the level of adoption of faculty members of the organization and the working of management as a circle structure. There are 16 items in this sub-component. A high score in this component indicates that the level of adoption of organizing and working in circles is high. The defining roles instead of tasks component measures faculty members' adoption of defining roles instead of tasks in university administration. There are five items in this sub-component and a high score indicates that the level of faculty members' adoption of defining roles is high.

Some researchers have examined holacracy in terms of its relationship with some variables (Archer et al., 2016; Deelen, 2017; Eremina, 2017; Fowler, 2018; Graham, 2010; Muff, 2017; O'Shea, 2016). However, these studies are generally conducted as qualitative research (Archer et al., 2016; Deelen, 2017; Eremina, 2017; O'Shea, 2016) and the opinions of employees in organizations that transitioned to holacracy within the framework of the relevant variable. However, there is no scale study on holacracy or the adoption of the holacracy model in higher education. It can be said that this situation makes the study more unique.

It is seen that almost all the studies done in Türkiye for adopting the Holacracy model are theoretical. It was determined that these studies were frequently associated with variables such as team learning, management systems, Generation Z and leadership (Demirbilek, 2021; Gür & Wolff, 2021; Öztürk Çiftçi, 2019; Uğur Sarıoğlu, 2021; Yeşilkaya, 2021). As an exception to this situation, Gür (2019) developed the questionnaire in her master's study and applied it to 40 enterprises and 60 people working in these enterprises. However, the fact that this scale was applied to a small-scale sample and that it was conducted on businesses reveals the difference from this research. In the light of what has been explained so far, it can be thought that implementing the holacracy model in university administrations may have positive

https://doi.org/10.32329/uad.1490403

effects for universities and university administrations.

When the literature on holacracy is reviewed, it is seen that holacracy is examined in international literature in terms of its relationship with various variables such as organizational structure, social support, social sustainability, entrepreneurial universities, dynamic governance, social changes, and know-how applications (Archer, Forrester-Wilson & Muirhead, 2016; Eremina, 2017; Fowler, 2018; O'Shea, 2016; Robertson, 2006, 2007; Viðarsson, 2017). When the national literature is examined, it is found that there are a small number of academic studies on the subject, mostly in the form of literature reviews; blog pages or consultancy firms conduct other studies. In the research conducted, no measurement tool was found in the field of education in general and educational administration in particular, which aims to measure the opinions of faculty members on the level of adoption of the holacracy model in university administration at both international and national levels. In this direction, it was thought that a scale aiming to determine the opinions of the faculty members on the level of adoption of the holacracy model by addressing holacracy, which is a neglected concept in Türkiye despite the increasing interest in the international literature, in higher education, could make a unique contribution to both the field of educational administration and the national literature.

Finally, it should be noted that the study was limited to the development of the HEHS. In future studies, evidence regarding the validity and reliability of the HEHS can be sought with large samples including instructors from different faculties or foundation universities. Thus, it can be discussed whether holacracy suits other faculties and foundation universities. On the other hand, examining the relationships between the HEHS and organizational structure can make essential contributions to the literature. Examining the related variables individually or in multiples may also be appropriate.

Description

This study was developed within the scope of the doctoral dissertation entitled "Holacracy in Higher Education and its Relationship with Academic Freedom", prepared by Merve Turpçu under the supervision of Professor Dr. İnayet Aydın at Ankara University Education Sciences Institute. The study was also presented as an oral presentation at the Xth EJERCongress 2023 held in Ankara on June 08-11, 2023.

Research Ethics

This research was conducted with the permission of Ankara University Social Sciences Sub Ethics Committee with the meeting decision dated 30/10/2020 and numbered 2020/130.

Author Contributions

The author(s) have accepted responsibility for the entire content of this manuscript and approved its submission.

Competing Interests

The author(s) has declared no conflicts of interest.

Research Funding

None declared.

Data Availability

Not applicable.

Peer-review

Peer-reviewed by external referees.

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