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Validation of a Model for Improving the Group Cooperation in School Teachers

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Abstract: Considering the current changes and conditions, greater attention should be given to promoting the spirit of cooperation among human resources working in schools in order to achieve organizational goals. With this in mind, the present study aimed to validate a model for improving group cooperation among school teachers. The research employed a descriptive-correlational design. The statistical population consisted of managers and teachers in the field of educational sciences in Qom City in 2021. A sample of 129 participants was selected through accessible sampling method and Cochran's formula. Data was collected using a researcher-made questionnaire consisting of 39 statements. To validate the proposed model, structural equation modeling was performed using PLS software. The findings indicated that the tool designed to test the proposed model had adequate validity and reliability. Additionally, the overall fit of the research model was appropriate and approved. The validation of the identified components showed that all paths had a critical value higher than the critical value (1.96) at the 95% confidence level, indicating the significance of the paths, the appropriateness of the structural model, and the confirmation of all the identified components. In conclusion, the proposed model was approved, and the designed questionnaire can be used to measure the spirit of group cooperation among school teachers.

Keywords: Group cooperation, Teachers, Model validation, Validity, Reliability

Introduction

Educational institutions have realized that in today's complex and challenging conditions, they will not be able to respond to the increasing needs of their society for comprehensive education without dedicated and specialized human resources. Therefore, given the changes and current conditions, more attention should be paid to the spirit of collaboration among the human resources working in schools in order to achieve organizational goals (Shahbazi et al., 2011). Thus, schools currently play a vital role as key agents in the social, economic, cultural, and political development of human societies through their role in educating human capital. Analysis of the factors affecting the growth and development of human societies indicates that the effectiveness and efficiency of the educational system in any country helps the all-round growth and development of that country (Jakubik, 2019). In order for educational institutions to advance, it is necessary for those involved in education and training, particularly teachers who have significant interaction with learners, to undergo a transformation. In fact, any meaningful and fundamental improvement in schools and the educational system must begin with teachers, and their knowledge, awareness, attitudes, skills, and methods must change (Safari et al., 2017).

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The spirit of teamwork and collaboration has received significant attention from many organizations due to its high importance for productivity. This issue is also important for government and non-government organizations, as weak collaboration among employees of an organization can led to the dissatisfaction of its superiors and the failure to achieve the predetermined goals of that organization. Desirable collaboration among employees of an organization increases its productivity, and this, in turn, improves the level of services provided by that organization and enhances the economy (Gomez-Mejia et al., 2014).

Schools are built to develop education and learning and create value-added in the knowledge and abilities of students (Fullan, 2013). They will not be able to accomplish this mission without collaboration among teachers (Ambrose et al., 2010). School improvement must begin with teachers (Safari et al., 2017). In this regard, it can be said that the spirit of group collaboration among teachers is due to their expertise and experience (Sandberg & Ottosson, 2010), which leads to high problem-solving capacity, positive attitudes that prevent overload processing, increases flexibility, and leads to creative decision-making (Rahimi et al., 2019). Therefore, in the past decade, the center of discussion and conversation about the quality of schools has been increasingly focused on collaboration among teachers (Richter et al., 2014).

Learning for teachers happens more when they find opportunities to collaborate with their professional colleagues inside and outside of the school and have opportunities for sharing their opinions (Duncombe & Armour, 2004). In fact, growth through collaboration is a new model of teacher education, a transformation in education, and even a new paradigm in which teachers collaborate with each other to improve the teaching and learning process. This type of learning has characteristics that distinguish it from other professional learning and engages teachers in groups that work together over time to improve teaching and learning. When teachers work and learn together, they improve both their own work and the learning of their students (Safari et al., 2017). Promoting group collaboration is the best, most cost-effective, and professional way to encourage schools to improve their educational status, and it includes collective actions by teachers to solve problems, design and improve teaching methods, educational texts, evaluation, and their involvement in the learning process of students (Schmoker, 2005).

In general, collaboration is a set of job-related behaviors that individuals exhibit (Gomez-Mejia et al., 2014). Collaboration is an important part of quality improvement policies for teaching and learning in advanced countries' schools, with a primary focus on teachers to increase their performance in schools. However, despite the importance of quality in educational systems and the role of teachers in improving the quality of the teaching and learning process, achieving this goal is still faced with weaknesses and

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shortcomings. Efforts to identify these shortcomings and find ways to improve and ensure them have become an undeniable necessity.

The spirit of group collaboration has been studied in various research studies. ShahVeisi (2019) in his research entitled "The Role of Collaboration Spirit in the Productivity of Elementary School Teachers with an Emphasis on the Mediating Role of Quality of Life" describes and explains the relationship between productivity, the amount or value of production performed, and the facilities and resources used, and demonstrates effective and efficient use of available resources to produce goods or services. Safari et al. (2018) in their research entitled "Collaboration among School Teachers and the Improvement of the Quality of the Teaching-Learning Process" stated that one of the ways to increase the knowledge and expertise of teachers is collaboration between them and learning through collaboration among teachers is a key part of teacher professional growth, as they increase their knowledge and experiences through sharing knowledge and creating unique learning opportunities with the help of their colleagues.

AlArafat and Doblas (2022) in their research titled "The Impact of Effective Group Work on Employee Performance: A Study of Remote Communication Companies in the Kingdom of Bahrain" concluded that every company should set specific goals to achieve its objectives. The success of a company in achieving these goals depends on various factors, one of which is the good and effective performance of its employees. Plotnikova and Strukov (2019) in their research titled "Integrating Collaborative Skills and Critical Thinking in the Process of Students' Education" concluded that the reforms taking place in the education system impose new requirements on the quality of students' education. Today's graduates of these schools must have a new professional thinking, high mobility, competence, tolerance, and focus on teamwork activities that are done collectively. A team-based educational environment provides students with the chance to develop not only their business interaction skills and abilities but also their critical thinking skills, such as creative thinking, utilizing new information, and applying knowledge in practical situations. As a result, in this study, a researcher-designed questionnaire was created to validate the model of promoting group collaboration spirit, and its psychometric indices were assessed based on the identified components.

Material and Methods

The research method used in this study is descriptive correlational. The statistical population of the study included 211 experienced managers and teachers who have studied in the field of educational sciences in 2021. Sampling was determined using the Cochran formula and 136 people were selected as the

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sample. The main questionnaire was distributed online and ultimately, 129 questionnaires were collected and analyzed. In this study, the identified components were considered as the independent variable and the promotion of teachers' group collaboration spirit as the dependent variable. Smart PLS3 software was used to analyze the data due to its suitability for analyzing a small sample size and not requiring a normal distribution (Kline, 2015).

To collect the data, a researcher-made questionnaire was used, which was designed based on the theoretical foundations and expert opinions obtained through interviews. The questionnaire consisted of 39 items and was designed on a five-point Likert scale (1: completely disagree to 5: completely agree) and made available online to the participants. The collected data were examined and analyzed using PLS3 software. Descriptive and inferential statistical methods were used. Cronbach's alpha was used to determine the reliability, and confirmatory factor analysis was used to determine the validity of the questionnaire and test the proposed model. Prior to the study, all participants were provided with an informed consent form and given explanations about the research objectives and their freedom to participate and withdraw from study.

Results

For assessing the validity of the structure, both convergent and discriminant validity were used in the structural equation modeling. Additionally, the reliability of the questionnaire tool was measured using Cronbach's alpha coefficient and composite reliability. Based on the results presented in Table 1 and the suitability of these coefficients, it can be concluded that the research tool has desirable validity and reliability.

To determine the convergent validity, the extracted average variance extracted (AVE) index was used. The AVE values for all variables in this study were above 0.5, indicating high convergent validity. Furthermore, the results showed that the values of Cronbach's alpha coefficient and composite reliability for all structures were above the acceptable threshold of 0.7, indicating desirable reliability. Based on the results presented in Table 1, all indices have suitable validity and reliability.

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Table 1. Composite reliability, Cronbach's alpha, and AVE

Variables	Items	Cronbach Alpha	Composite reliability	Validity	AVE	R^2	Q^2
Environmental factors	1-3	0.762	0.725	0.750	0.545	-	-
Communication factors	4-6	0.823	0.888	0.953	0.728	-	-
Entrepreneurial factors	7-9	0.839	0.755	0.901	0.544	-	-
Behavioral factors	10-12	0.913	0.703	0.944	0.848	-	-
cultural factors	13-15	0.772	0.781	0.848	0.567	-	-
Management factors	16-18	0.754	0.740	0.745	0.563	-	-
Individual factors	19-21	0.800	0.800	0.859	0.584	-	-
Educational factors	22-24	0.778	0.805	0.869	0.689	-	-
social factors	25-27	0.915	0.946	0.954	0.855	-	-
legal	28-30	0.741	0.704	0.863	0.641	-	-
Economic	31-33	0.841	0.889	0.910	0.729	-	-
The voice of the staff	34-36	0.945	0.948	0.964	0.900	-	-
Enhancing the spirit of group cooperation	37-39	0.883	0.885	0.928	0.810	0.873	0.823

Furthermore, to assess convergent validity, the average variance extracted (AVE) index was used, and to measure discriminant validity, the square root of the AVE was used (Sabokro et al., 2018). According to the findings, the values of the square root of the AVE for all components were above the minimum acceptable threshold of 0.5, indicating that the research variables have discriminant validity. Additionally, since the values of the square root of the AVE were higher than the correlation between the target variable and other variables, acceptable discriminant validity is achieved when the values on the main diagonal are higher than their lower values (Fornell & Larcker, 1981). Therefore, the variables are valid, and their discriminant validity is also confirmed. Based on this, the measurement model has suitable convergent and discriminant validity and reliability (composite reliability, Cronbach's alpha, and AVE).

The model fit was examined at three levels of measurement, structural, and overall. Several criteria are used to assess the model fit in structural equation modeling, and the primary criterion is the significant coefficients or t-statistics ((Kline, 2015). The model fit was evaluated using t-values, which should be greater than 1.96 for a 95% confidence level to confirm their significance. The results of this criterion showed that the obtained values, which exceed the critical value of 1.96 at a 95% confidence level, are significant. The R^2 is a measure of the effect of exogenous variables on an endogenous variable, with values of 0.19, 0.33, and 0.67 considered weak, moderate, and strong R^2 values, respectively. In this study, the desired value for enhancing the collaborative spirit of school teachers is 0.873, indicating a strong structural model fit according to this criterion. The Q^2 measure is calculated for all dependent structures and represents the product of the composite values of the research structures and their respective determination coefficients. This value should be 0.2, 0.15, and 0.35 for weak, moderate, and strong predictive power, respectively, for all endogenous structures (Kline, 2015). In the present study,

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the Q^2 value for enhancing the collaborative spirit of school teachers is 0.823, indicating a high and acceptable fit of the structural model.

The general model consists of both the measurement and structural models, and its overall fit is assessed by confirming its fit in a complete model. Therefore, the overall fit of the model can be assessed using the goodness of fit (GOF) index. Based on the obtained value of 0.735 for GOF, the overall fit of the research model is very suitable and confirmed. Considering the three values of 0.01, 0.25, and 0.36, which are introduced as weak, moderate, and strong values for GOF, the value of 0.735 for this criterion indicates a strong fit of the overall model in the research. Another index is the standardized root mean square residual (SRMR), which is also within an acceptable range, indicating that the research model has a very good fit. The normalized fit index (NFI) was also used to assess the fit. The acceptable range of this index is between 0 and 1, and NFI should be greater than 0.90 (Kline, 2015). The value of 0.946 for this index is also confirmed. Finally, to examine the assumed relationships between the variables, the t-statistic was used. To determine the effects of predictive variables on dependent variables, the standardized factor loadings of each path of the hypotheses were examined. These coefficients indicate the percentage of changes in dependent variables explained by independent variables.

Table 2. The t-statistic and the effect coefficients

Path	T value	Effect coefficient	Result
Environmental factors - improving the spirit of group cooperation of school teachers	2.058	0.313	Confirmed
Communication factors - improving the spirit of group cooperation of school teachers	2.618	0.152	Confirmed
Entrepreneurial factors - improving the spirit of group cooperation of school teachers	2.068	0.019	Confirmed
Behavioral factors - improving the spirit of group cooperation of school teachers	2.111	0.028	Confirmed
Cultural factors - improving the spirit of group cooperation of school teachers	2.530	0.133	Confirmed
Management factors - improving the spirit of group cooperation of school teachers	2.066	0.183	Confirmed
Individual factors - improving the spirit of group cooperation of school teachers	2.697	0.411	Confirmed
Educational factors - improving the spirit of group cooperation of school teachers	2.740	0.160	Confirmed
Social factors - improving the spirit of group cooperation of school teachers	2.049	0.226	Confirmed
Legal factors - improving the spirit of group cooperation of school teachers	2.027	0.221	Confirmed
Economic factors - improving the spirit of group cooperation of school teachers	2.459	0.106	Confirmed
Voice of the staff - improving the spirit of group cooperation of school teachers	2.048	0.434	Confirmed

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The results of the validation of the identified components showed that the obtained t-values for the the effect of environmental factors on promoting group cooperation spirit of school teachers was (2.058), the effect of relational factors on promoting group cooperation spirit of school teachers was (2.618), the effect of entrepreneurial factors on promoting group cooperation spirit of school teachers was (2.068), the effect of behavioral factors on promoting group cooperation spirit of school teachers was (2.111), the effect of cultural factors on promoting group cooperation spirit of school teachers was (2.530), the effect of managerial factors on promoting group cooperation spirit of school teachers was (2.066), the effect of individual factors on promoting group cooperation spirit of school teachers was (2.697), the effect of educational factors on promoting group cooperation spirit of school teachers was (2.740), the effect of social factors on promoting group cooperation spirit of school teachers was (2.049), the effect of legal factors on promoting group cooperation spirit of school teachers was (2.027), the effect of economic factors on promoting group cooperation spirit of school teachers was (2.459), and the effect of employee voice on promoting group cooperation spirit of school teachers was (2.048). All of these values are greater than 1.96, indicating the significance of the paths, the suitability of the structural model, and the confirmation of all the identified components in promoting group cooperation spirit of school teachers.

The results also showed that the impact coefficient for environmental factors on promoting group cooperation spirit of school teachers is (0.313), the impact coefficient for relational factors on promoting group cooperation spirit of school teachers is (0.152), the impact coefficient for entrepreneurial factors on promoting group cooperation spirit of school teachers is (0.019), the impact coefficient for behavioral factors on promoting group cooperation spirit of school teachers is (0.028), the impact coefficient for cultural factors on promoting group cooperation spirit of school teachers is (0.133), the impact coefficient for managerial factors on promoting group cooperation spirit of school teachers is (0.183), the impact coefficient for individual factors on promoting group cooperation spirit of school teachers is (0.411), the impact coefficient for educational factors on promoting group cooperation spirit of school teachers is (0.160), the impact coefficient for social factors on promoting group cooperation spirit of school teachers is (0.226), the impact coefficient for legal factors on promoting group cooperation spirit of school teachers is (0.221), the impact coefficient for economic factors on promoting group cooperation spirit of school teachers is (0.106), and the impact coefficient for employee voice on promoting group cooperation spirit of school teachers is (0.434). Based on the results, the greatest impact is related to employee voice.

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Discussion

The aim of this research was to validate a model for promoting group cooperation spirit among school teachers. The findings showed that the designed tool for testing the proposed model has appropriate validity and reliability. Also, according to the results, the overall fit of the research model was suitable and confirmed. Therefore, the proposed model was confirmed and the designed questionnaire can be used to measure group cooperation spirit among school teachers. The research results indicated that environmental, relational, entrepreneurial, behavioral, cultural, managerial, individual, educational, social, legal, economic, and employee voice factors are important in promoting group cooperation spirit among school teachers. Thus, it can be concluded that schools with inflexible structures are more likely to experience chaos in creating cooperation and unity during crises, while schools with flexible structures create positive and effective factors for innovation in their schools. The more bureaucratic the organizational structure is, the less creativity and innovation it will have due to standardization of activities, guidelines, and organizational regulations. Therefore, reducing the hierarchy of the organizational structure eliminates a significant obstacle to creativity and innovation.

The research findings showed that the questionnaire presented to validate the proposed model has appropriate validity and reliability. Therefore, this questionnaire can be used for research purposes and to measure group cooperation spirit among teachers and managers. However, this research had some limitations, such as the use of self-reporting questionnaires and the limited sample of teachers and managers from Qom city. Therefore, it is recommended that future research investigates the topic in other statistical communities. It is also suggested that the relationship between group cooperation spirit and other related variables, such as teachers' professional development, teaching self-efficacy, job motivation, and job burnout, be examined.

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