Professional Identity Promoting Professional Development of Teachers in Forestry Science Based on Survival Analysis Model

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Abstract:

Survival analysis model is one of the common analysis models in forest industrial manufacturing. Based on the survival analysis model, this paper studies the role of professional identity in promoting professional development of teachers in forestry science. Teachers with different professional identity have different development characteristics in all aspects of professional structure. On the basis of field interviews, this study analyzes four ways that teachers' professional identity affects their professional development. The results show that professional identity can stimulate the persistence of teachers' professional beliefs and promote the reasonable construction of teachers' professional ideas; Professional identity can stimulate teachers' reflection and accumulation. Professional identity can promote the development of teachers' professional knowledge and ability. Professional identity can stimulate the motivation of teachers' development and affect the formation and change of professional attitude motivation. Professional identity can promote teachers' awareness of self professional development and tend to the ideal state of professional development. The results of this study have a certain reference value for the research on the promotion of teachers' professional identity to professional development.

Keywords: Survival analysis model, forestry science, teachers' professional identity, professional development, big data, industrial manufacturing.

I. INTRODUCTION

From previous studies, we can find that the issue of role and role identity has always been the object of extensive research in the social science community [1-2]. The research of related

concepts, theories and measurement methods in various fields at home and abroad is tending to be perfect, and more and more attention is paid to diversified and specific research. Previous studies have put forward a clear definition of role identity: role identity is regarded as a kind of cognition, an emotion, an attitude and a behavior; It is a continuous process of interaction among cognition, feeling, experience and practice [3]. It is the core of acquiring self-identity. This paper constructs a multi-dimensional structure model of role identity, summarizes its characteristics and stages, and explores the influencing factors of role identity [4-5].

However, there are still some deficiencies: there are few researches on the role identity of teachers as a specific profession and the formation of a systematic system: there are few effective and feasible questionnaires to measure the role identity of teachers; It is rare to explore the structural model of teachers' role identity; The suggestions for promoting the healthy development of teachers' role identity are lack of empirical research basis and are not supported [6]. This study has not retrieved the relevant research on the combination of teachers' role identity with teachers' work pressure and teachers' well-being, and lacks empirical research on evaluating teachers' role identity by examining teachers' work pressure and teachers' well-being. The above deficiencies are the starting point and foothold of this study.

II. THE MEASUREMENT AND CHARACTERISTICS OF TEACHERS' ROLE IDENTITY

2.1 Research objects
(1) Open questionnaire subjects
Using cluster stratified sampling method, 200 teachers in our school were selected as the survey objects. 190 questionnaires were sent out and the recovery rate was 95%; 9 invalid questionnaires were eliminated, and 181 valid questionnaires were obtained, with an effective rate of 95.26%. The detailed distribution of subjects is shown in Table 1.

TABLE I. Distribution of subjects in open questionnaire

GENDER	SCHOOL		TOTAL
	Primary school	Middle school	
Male	13	18	31
Female	95	55	150
Total	108	73	181

(2) Forecast object

A total of 260 primary and secondary school teachers from Benxi in Eastern Liaoning Province, Shenyang in central Liaoning Province and Chaoyang in western Liaoning Province were selected by cluster stratified sampling method. The initial questionnaire of teachers' role identity was issued and 240 questionnaires were collected, with a recovery rate of 92.31%; 19 invalid questionnaires were eliminated, and 221 valid questionnaires were obtained, with an effective rate of 92.08%. The detailed distribution of subjects is shown in Table 2.

TABLE II. Distribution of subjects in the initial questionnaire

GENDER	SCHOOL			URBAN AND RURAL			TOTAL
	Primary school	Middle school	Missing value	City	Countryside	Missing value	
Male	15	20	1	21	14	1	36
Female	112	66	3	26	52	3	181
Missing value	2	0	2	2	0	2	4
Total	129	86	6	49	66	6	221

2.2 Research program

(1) Open questionnaire survey. Literature retrieval, analysis of data, preparation of open questionnaire, and investigation of 200 primary and secondary school teachers in Shenyang. Organize the contents of the open questionnaire, form specific items and synthesize the initial questionnaire. Ask psychologists, teachers and students to evaluate, delete and modify unreasonable items, and finally form an initial questionnaire. (2) Initial questionnaire survey. The initial questionnaire was distributed in some areas of Liaoning Province. Carry out item analysis and exploratory factor analysis on the data, delete invalid items and form a formal questionnaire. (3) Formal questionnaire survey. J-questionnaire was distributed in some areas of Liaoning and Shanxi. The valid questionnaire was randomly divided into two homogeneous parts, which were used for exploratory factor analysis and confirmatory factor analysis respectively [8-10]. According to the theoretical construction and exploratory factor analysis results, a verification model is established and further verified by confirmatory factor analysis. (4) Data analysis and processing. Through factor analysis, extract factors, name each factor, and define the specific connotation of each factor in detail.

2.3 Research results and analysis

(1) Coding and analysis of open questionnaire

The seven ranking questions in the first part of the open-ended questionnaire let teachers judge the order of the same teacher's role in different dimensions. The seven dimensions are: importance, social expectation, self expectation, pride, happiness, time and energy, self harvest. The eight roles of teachers are: the educator of teaching and educating, the transmitter of cultural knowledge, the developer of intellectual resources, the organizer of educational activities, the director of mental health, the demonstrator of moral norms, the agent communicator of parents and schools, and the researcher of educational science. Sorting out the percentage of the number of people in each dimension, the percentage of the number of "educators who teach and educate" in the first place in each dimension is more than 30%. In the three dimensions of social expectation, invested time and energy, and self harvest, the percentage of the number of "cultural knowledge transmitters" is second only to "educators who teach and educate". In the other four dimensions, the ratio of "moral standard demonstrator" is significantly higher than that of other items.

For the eight open-ended questions in the second part of the open-ended questionnaire, the researchers sorted out and analyzed the answers of each question, summarized the key words, clustered the key words with similar meaning, and summarized the most frequent words. Finally, combined with the orientation of the first seven topics, the typical characteristic words which can represent the teacher's role identity are selected and expressed in simple and easy to understand language. The characteristics of teacher's role identity are summarized from six aspects.

(2) Evaluation of initial questionnaire

In order to better analyze the items of the questionnaire, exploratory factor analysis is carried out on the data. The data of the remaining 33 items are analyzed by the general Principle component method, and the factor load matrix is obtained by the orthogonal maximum variance rotation method (Varimax). KMO(Kaiser-Meyer-Olkin) test and Bartlett spherical test were used to investigate the suitability of exploratory factor analysis. In this study, KMO value is 0.911, and the closer KMO value is to 1, the better. 0.911 is above 0.90, and the effect is excellent. at the same time, x^2 value of bartlett spherical test is 5071.395 (degree of freedom is 435, p =-0.000), which is extremely significant, which indicates that there are common factors among the correlation matrices of this data group, and it is feasible to conduct factor analysis.

According to the results of factor analysis, the inappropriate items are deleted according to the following four criteria: First, the factor load value less than 0 indicates that the item variables cannot reflect the characteristics of related factors. According to research experience,

projects with factor load value less than 0.4 are generally deleted. Second, items with commonality less than 0.20. The commonality of projects reflects the degree to which projects are explained by extracted public factors. The greater the degree of commonality, the higher the degree of public factors explaining the project; otherwise, the lower the degree of explanation. Generally, items with commonality lower than 0.2 will be deleted. Third, the factor load value is not single. The factor load value of the project is close to or greater than 0.40 under two or several factors, indicating that the project classification is not significant and should be deleted. Fourth, the number of factor items is less than three. When the number of items included in the factors is less than 3, the number of items is too small, which fails to achieve the purpose of reflecting the characteristics of the factors.

III. CHARACTERISTICS OF TEACHERS' ROLE IDENTITY

3.1 Research objects

A total of 600 primary and secondary school teachers in Shenyang, Benxi, Chaoyang and other areas of Liaoning Province were selected by cluster stratified sampling method. The formal questionnaire of teachers' role identity was issued and 525 questionnaires were collected, with a recovery rate of 87.5%; After 44 invalid questionnaires were eliminated, 481 valid questionnaires were obtained, and the effective rate was 91.62%.

3.2 Research tool

(1) The formal questionnaire of teacher's role identification (see Appendix 3) is compiled by ourselves.

(2) Statistical tools. SPSS16.0 was used as the statistical tool, t-test, one-way ANOVA and other statistical methods were used for data processing.

3.3 Research procedures

(1) Questionnaires were sent out. The formal questionnaire of teachers' role identification was issued and the data were collected.

(2) Data processing. Statistical data, analysis of the characteristics of teachers' role identity and its differences in gender, urban and rural areas, schools, age, length of teaching, treatment level.

3.4 Research results and analysis

(1) An analysis of the general characteristics of teachers' role identity

In order to investigate the basic status of teachers' role identity, this study makes statistics on the average, standard deviation, maximum and minimum of 481 primary and secondary school teachers' total score and six factors. The results are shown in Table 3.

TABLE III. Descriptive statistical results of teachers' role identification and factors (N-481)

VARIABLE	MINIMUM	MAXIMUM	MEAN	SD
Role identification	37.00	146.00	3.94	14.182
Role identity	9.00	40.00	4.5	4.279
Role value identification	13.84	37.00	3.38	4.368
Role behavior identification	3.00	15.00	4.19	2.204
Role environment identity	3.00	15.00	3.51	3.082
Role skill identification	4.00	20.00	4.02	2.634
Role interpersonal identity	4.00	20.00	4.01	2.635

As can be seen from the above table, the average score of the total questionnaire of teachers' role identity is 118.288, and the standard deviation is 14.182. Considering the unequal number of items, after homogenization, the average score of the total questionnaire is 3.94. The average score of each factor is between 3.38 and 4.51. Compared with the critical value of 3, the total score and the score of each factor are above the critical level, which indicates that the level of our primary and secondary school teachers' role identity is above the critical level, and the overall trend is in the upper middle level. Among the six factors, the level of teachers' role value identity and role environment identity is slightly lower than other factors.

(2) An empirical study of gender differences in teachers' role identity

T-test of teachers' role identity at gender level, the results (see Table 4) show that there are extremely significant differences in the degree of teachers' role identity at gender level. The level of female teachers' role identity in China is significantly higher than that of male teachers. Among the six factors of teachers' role identity, there are significant differences in role orientation identity, role value identity, role behavior identity and role interpersonal identity. It shows that among the differences of teachers' role identity at gender level, teachers' role orientation identity is dominant, followed by teachers' role value identity, role interpersonal

identity, and finally role behavior identity, and the degree of female teachers is significantly higher than that of male teachers.

TABLE IV. Gender differences in Teachers' role identification (N male = 96, N female = 385)

VARIABLE	GENDER	MEAN	SD	T
Role identification	Male	3.821	0.502	-2.721
	Female	3.97	0.463	
Role identity	Male	4.303	0.648	-3.984
	Female	4.549	0.496	
Role value identification	Male	3.274	0.577	-1.999
	Female	3.402	0.538	
Role behavior identification	Male	4.065	0.694	-1.778
	Female	4.217	0.743	
Role environment identity	Male	3.478	1.060	-0.363
	Female	3.955	1.016	
Role skill identification	Male	4.030	0.747	-0.976
	Female	4.03	0.636	
Role interpersonal identity	Male	3.888	0.677	-1.998
	Female	4.041	0.652	

3.5 Discuss

(1) An analysis of the general characteristics of teachers' role identity

The results show that the average value of the total questionnaire is 3.94, which is higher than 3 points and lower than 4 points. It is in the middle and upper level, indicating that the overall level of teachers' role identity in primary and secondary schools in China is above the middle level, and the overall level has not reached a higher level. However, among the internal factors of teachers' role identity, the average values of role orientation identity, role behavior identity, role skill identity and role interpersonal identity are all higher than 4 points. Only the two factors of role value identity and role environment identity are lower, and far lower than 4 points. These data reflect that the overall level of China's primary and secondary school teachers' role identity has not reached a higher standard, not the whole range of teachers' role identity has not reached the standard, but because of several prominent factors of low-level identity, the overall situation is slightly inadequate, one-sided or insufficient phenomenon, which reflects that China's primary and secondary school teachers underestimate the value of their teaching profession. In the aspects of national policy, teacher status and public opinion, most praise teachers' profession as a great and respected occupation, but influenced by traditional evaluation, teachers are regarded as teachers, and they fail to create any material energy. Teachers lack of new value identification concept of correct view of teachers' angle. At the same time, there is a low recognition of teachers' environment. The primary and secondary school teachers are not satisfied with their teaching environment. Although the state has increased their investment in nine-year compulsory education and established a full free education system, the teaching equipment in some rural areas is still backward, the difference between education investment and treatment between urban and rural areas is large, and the opportunities for rural teachers to study and study are rare. Therefore, it is still a long way to change the traditional role value evaluation of teachers, improve the teaching environment and promote the overall development of teacher role identification.

(2) Gender characteristics of teachers' role identity

The results show that the female teachers' scores of teacher role identification are slightly higher than that of male teachers in both overall and all dimensions, and the differences are significant in overall score, role orientation identity, role value identification, role behavior identity and role environment identity. That is, female teachers are more accurate than male teachers in their position of teacher role, and their value is well estimated, they are willing to make behaviors that they want and others expect, and are more satisfied with the teaching environment. This result is similar to Wei Shuhua's research. Wei Shuhua's research results show that the level of female teachers' professional identity is significantly higher than that of male teachers. There are significant differences between male and female teachers in their role identity, which is closely related to the traditional culture and the traditional understanding of teachers' profession. In our country, from society to school, primary and secondary school

teachers are considered to be female occupations, and they have few challenges and low risks. When they play the role of teachers, many parents and teachers think that the role of nanny is mixed, which is a kind of home-based and inward professional role in the social division of labor, and also a role suitable for women expected by the society. In such a cultural atmosphere, some of the male teachers tend to pay too much attention to academic or professional titles and concentrate on learning. Some of them have a stable job and want to leave the teaching post. This leads to the biased or insufficient role identity of male teachers, which leads to the lower level of role identity of male teachers than that of female teachers.

IV. SHORTCOMINGS AND SUGGESTIONS OF THE RESEARCH

4.1 The shortcomings of this study

(1) The sample sampling of this study has limitations. The questionnaire is mainly sampled in some areas of Liaoning and Shanxi provinces. The sample representativeness is insufficient. The distribution proportion of primary and secondary school teachers is improper, and there is a gap with the actual proportion, which will affect the universal applicability and popularization of the research results. In order to be more scientific and reasonable, we should further expand the scale and coverage of the subjects, establish norms on the basis of the original survey, and improve the practicability of the questionnaire.

(2) The research methods of this study are questionnaire survey and interview. The questionnaire method is only an inferential test to investigate the characteristics of the current situation and its relationship, but it can not accurately express the internal influence among the variables. Future research should combine more case studies, field experiments or laboratory experiments to explore the model and mechanism of teachers' role identification from multiple directions and angles, so as to make the research have higher empirical significance, operational significance and repeatability.

4.2 Proposal

The good development of teachers' role identity, the pursuit of teachers' happiness and the reduction of teachers' work pressure need the joint efforts of society, schools and teachers. The society should provide a reasonable environment for the survival and development of individual teachers, improve their personality charm and quality of life, and provide external atmosphere and conditions for teachers to promote role identification and pursue happiness. Schools should adopt flexible management system to improve teachers' professional quality and value expectations, and provide teachers with a broad space to display their talents and abilities. Teachers should grasp the internal demands and external scales in their career, integrate the teaching mission and self-worth organically, improve themselves, realize themselves and

surpass themselves, so as to sublimate the value and significance of teachers' life and experience the glory and glory of teachers' career.

(1)The society endows teachers with professional autonomy

At present, although the professional autonomy of primary and secondary school teachers in China has received some attention, it is far from enough. Therefore, it is urgent to return to the professional autonomy of primary and secondary school teachers. First of all, primary and secondary school teachers should have a view of teachers, have independent space and cultural support, respect the independent consciousness and needs of primary and secondary school teachers, give them the right to participate and speak, listen to their voices, record their growth experience, solve problems, and improve the education system and policies. Secondly, primary and secondary school teachers' professional autonomy should be awakened, and they should actively participate in the internal teaching exchange management. So as to construct the good social status of primary and secondary school teachers psychologically, give them the role value emotion of autonomy and self-reliance, and realize the happiness emotion of self-esteem and self love.

(2) School expands teachers' professional development platform

School administrators should be committed to expanding the platform for teachers' professional growth and development, creating opportunities for teachers' self-development to go out for further study, so as to improve teachers' own quality, tap teachers' potential ability and talent, and create a harmonious space atmosphere of showing talents. First of all, the school should organize teachers to exchange and learn with each other within and between disciplines, to make up for the deficiencies in teaching and solve practical problems. Secondly, teachers' learning together can achieve the goal of establishing a good school cultural atmosphere. The general environment of school culture will be fed back to teachers, which is conducive to the comprehensive and professional ability of teachers. Finally, in a short period of time, the learning opportunity of going out for further study can effectively improve teachers' teaching ability. Through further study, teachers come into contact with the advanced teaching experience and teaching methods of other schools. With the improvement of their own ability, teachers will form a stable understanding of teachers' role, understand teachers' sense of value and existence, and improve teachers' role identity. And through teachers' further study and learning, teachers' work pressure can be transformed into learning motivation, and teachers' happiness index can be better improved.

V. CONCLUSION

(1)The overall well-being of primary and secondary school teachers is above the middle

level, but its own development is unbalanced.

(2)There are significant differences in the happiness of primary and secondary school teachers in gender, school, age and teaching age: the happiness of female teachers in primary and secondary schools is significantly higher than that of male teachers; the happiness of primary school teachers is higher than that of middle school teachers; with the increase of age and teaching age, the overall development level of happiness presents a downward trend.

(3)There is no significant difference between urban and rural primary and secondary school teachers' well-being and the level of treatment.

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