



Designing a model to empower the educational system performance of agricultural vocational schools

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Abstract: This research aimed to compare the perspective of trainers and trainees at agricultural vocational schools in Iran regarding the empowerment of the educational system. It is an applied study in orientation, a hypothesis-testing study in goal, and a comparative causal study in strategy. Data were collected with a researcher-made questionnaire. The statistical population was composed of all trainers and trainees of the agricultural vocational schools in the 2020-2021 educational year amounting to 1119 trainees and 120 trainers, out of whom 169 trainees were sampled by simple randomisation and 120 trainers were sampled by the consensus method to participate in the research. The data were analysed in the Smart PLS3 and SPSS version 23 software packages. In addition to the descriptive statistics, the construct validity and the fit of the model were determined by confirmatory factor analysis and structural equation modeling. The management process, the educational process, curriculum content, technical teacher training, and the supply of space, equipment, and technology have positive and significant effects on the empowerment of the educational system at the agricultural vocational schools in both the trainers and trainees' groups. The empowerment of the educational system at agricultural vocational schools is effective in achieving quality assurance in the educational system and subsequently, improving its quality continuously. This paper contributes to developing a theoretical framework by considering the dimensions and components underpinning an empowering educational system. This study is the first attempt to compare the perspective of trainers and trainees about an empowering educational system in agricultural vocational schools. The study provides a framework in which special attention is paid to the empowerment of the educational system at these schools so that the managers and trainers can work with more authority and play a role in improving the educational system of the agricultural vocational schools.

Keywords: Vocational education system, empowerment, structural equation modelling

1. Introduction

In today’s society, agriculture literacy has gained importance due to the increasing demand for skillful workers in agriculture, food, and natural resources industries (Henry et al., 2014) so that the agricultural educational system is one of the most critical parts of the education system in all countries (Gunasekera et al., 2018). The agricultural educational system has great responsibilities for realising personal and social goals (Albright & Bundy, 2018) and aims at learning and making change (Didham & Ofei-manu, 2020). It is the best place for the actualization of personal talents (Jose et al., 2020). Attention to the agricultural educational system has a special place in the key policies of countries for fostering an efficient human resource at the pre-university level (Okpokwasili, 2019). The first essential step to create an efficient agricultural training system is to strengthen the capabilities of the trainers and trainees (Amin Khandagi et al., 2012). A point to note is that the majority of these skills have been concentrated in agricultural vocational schools, and trainers and trainees can play a significant role in empowering the educational system (Bagherpour & Parand, 2013).

Research shows that group activities by trainees are effective in fostering critical thinking (Piedade et al., 2020), reinforcing group work (Hammar Chiriac, 2014), and enhancing their ability to assess studies and acquire the experiences and skills required (Angu, 2019). However, although the key goal of educational systems, especially agricultural vocational schools, is to train skilful and efficient human resources, evidence points to the failure of these systems, particularly the educational system of agriculture (Salehi et al., 2006). This unwanted phenomenon would urgently call for changes in its structure, programs, goals, and methods as an unavoidable necessity (Efthymiou & Zarifis, 2021).

The above-listed problems reveal a weakness in the scientific and administrative body of training in agricultural vocational schools although research on high schools in Iran has generally reported that high-school students are faced with problems in different educational fields (Movahed Mohammadi et al., 2013) such as inattention to training effectiveness (Issa et al., 2021), weak relationship between education and labor market needs (Dulandas & Brysiewicz, 2018; Salimi, 2014), inattention to quality and effectiveness of educational system (Efthymiou & Zarifis, 2021; Roopa et al., 2021; Garira, 2020), lack of competent trainers (Khalili et al., 2010), lack of space and educational facilities (Barrett et al., 2019; Saaid et al., 2018; Movahed Mohammadi et al., 2013), lack of investment in physical facilities and equipment (Olufunke & Olubunmi Adesua, 2016; Cho & Wonyoung Beak, 2019; Iyunade, 2014), improper teaching-learning methods (Jame Bozorg, 2012; Lankarani & Emadzadeh, 2002), lack of competent experts and managers (Navidi, 2011), lack of teaching skills (Movahed Mohammadi et al., 2013), weakness in scientific characteristics and capabilities, teaching skills of trainers and their relationship with trainees, severe lack of high-quality human resource (van Dijk et al., 2020; Navidi, 2011), poor internal efficiency of the system and educational curricula including curriculum level, content, and quality, apprenticeship system, and selection criteria of trainers and trainees, consultation and job advice methods (Shariatzade et al., 2006), unemployment of graduates (Mirrahimi et al., 2016), lack of coordination between trainees’ skills and labor market needs (Eskandari et al., 2016), and lack of metacognitive capabilities (Alvarez, 2018). Based on the previous studies, by resolving any of these challenges, a more powerful educational system can be created (Ebrahimi Moghaddam & Khoshchreh, 2016). The development of a robust educational system requires predicting and adjusting educational events based on goals, content, and available facilities considering the characteristics and cognitive construct of the trainees (Cleary et al., 2017). Today, the trend of the enhancement of empowerment programs in the educational system of agricultural vocational schools in Iran has seemingly lagged behind the other parts of the world so that limited number of studies have dealt with it and they have mostly addressed the results of the programs, mostly short-term programs. However, significant advancements have occurred in this field in various schools and regions (Moradi & Didehban, 2017). Since it is inevitable for educational systems of the agricultural vocational schools to have up-to-date programs, empowering models, and a systematic approach with an added-value perspective, the use of the model presented here with a long-term approach can be very effective in empowering educational systems. Figure 1 depicts a theoretical model for educational system empowerment.

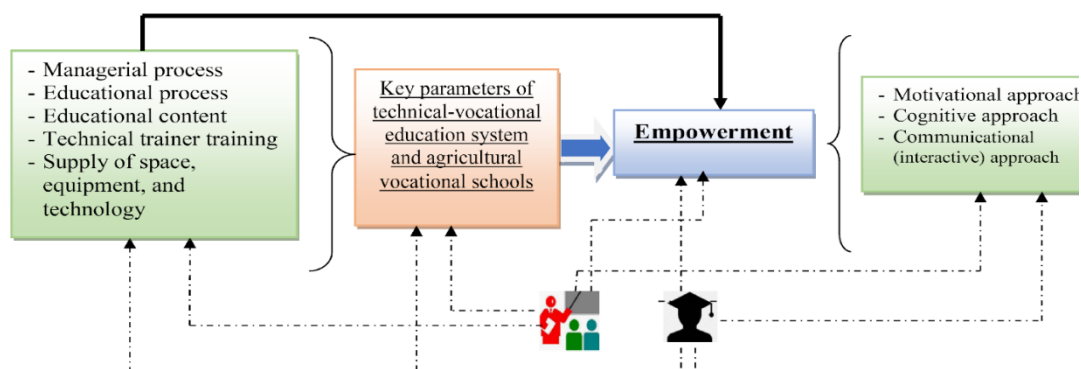


Fig. 1 - A theoretical model for educational system empowerment in Iran (derived from the present research)

1.1 Theoretical Framework and Literature Review

School leadership is increasingly known as a critical factor in school improvement, empowerment, and effectiveness, teachers' quality, and students' achievement throughout the world (Barber et al., 2010). Research shows that school management is one of the most significant factors affecting schools and students' learning outcomes, e.g., literacy level, achievement test results, and academic achievement of the students (Bush and Glover, 2016). Bush and Oduro (2006) claim that 27% of the variance in students' learning and academic outcomes is related to the component of school management and leadership (Hypothesis 1). So, it is hypothesised that *the management process has a positive and significant effect on the empowerment of the educational system at agricultural vocational schools in Iran*.

It is argued that the educational process and educational system empowerment are necessary components of the educational system and tools to achieve organizational goals. Education and empowerment equip teachers to achieve organizational goals. Education and empowerment essentially provide sustainable opportunities as per the students' talents to acquire knowledge and skills and put them in practice in an optimal working environment to accomplish optimal performance (Yamoah, 2013). In this regard, Kennedy (2009) found that the educational process influenced professional empowerment (Hypothesis 2). So, we hypothesize that *the educational process has a positive and significant effect on the empowerment of the educational system at agricultural vocational schools in Iran*.

An issue that has drawn the attention of organizational development scholars is the role of education quality and content in the development and empowerment of human resources tailored with the transformation of the current era (Channawar, 2019). Empowerment through education as an organizational program enables teachers to enhance the intellectual level of students, thereby escalating their productivity and effectiveness in addition to allowing the effective use of knowledge and skills in parallel with organizational goals and strategies (Jafari Harandi & Fakhrzadeh, 2011) (Hypothesis 3). As such, it is hypothesised that *curriculum content has a positive and significant effect on the empowerment of the educational system at agricultural vocational schools in Iran*.

In educational organizations, teachers are a part of human resources whose empowerment is of crucial significance, so a method recommended by management scholars to achieve this goal is teacher empowerment (Najafi et al., 2020). In this regard, Sobhaninia (2014) found a positive and significant relationship between teachers' motivation and adequate expertise and the improvement of schools' empowerment (Hypothesis 4). So, we hypothesize that *technical teacher training has a positive and significant effect on the empowerment of the educational system at agricultural vocational schools in Iran*.

The remarkable effect of the physical dimensions and appearance of classrooms and schools on students' learning has always been emphasised in the educational context. Indeed, attention to the aesthetic and artistic aspects of educational spaces is highly influential on the mentality and affection of students towards teaching and learning (Al-Saleh et al., 2018). Ostapczuk et al. (2012) suggest that the educational environment is among the most important determinants in a lesson plan (Hypothesis 5). This research hypothesizes that *space and equipment supply has a positive and significant effect on the empowerment of the educational system at agricultural vocational schools in Iran*.

2. Methodology

This research is an applied study in terms of orientation, a hypothesis test in terms of goal, and a survey in terms of strategy. For the study case, a researcher-designed questionnaire was used for data collection. The statistical population was composed of all trainees and trainers of agricultural vocational schools in the 2020-2021 educational year in Iran. Due to the COVID-19 pandemic and the closure of the schools, it was impossible to access all trainees and trainers throughout Iran. Given the questionnaires sent via e-mail, only those provided by the trainees and trainers in the provinces of Tehran, Khuzestan, Fars, Qazvin, Mazandaran, and Semnan could be assessed. They are listed in Table 1. It should be noted that the trainees amounted to 1119 people and the trainers amounted to 120 people. Cochran's formula was used to estimate the sample size. Accordingly, 169 trainees were sampled by simple randomisation whereas since the trainers were few, all were included in the sample by the consensus technique.

Table 1 - The sample size of the studied people

Province	Trainers (Consensus sampling)	Trainees (Simple randomization)
Tehran	21	41
Khuzestan	13	37
Fars	36	36
Qazvin	24	24
Mazandaran	28	28
Semnan	3	3
Total	120	169

To achieve the research goal, a quantitative questionnaire was developed as the primary research instrument. Data of the study, collected with a literature review, were self-tested by this questionnaire. Considering the conceptual framework of the study, the questionnaire was composed of eight main sections scored on a five-point Likert scale, as well as a section for demographic information. The main sections included management process (16 items), educational process (8 items), curriculum content (31 items), technical teacher training (17 items), physical space (26 items), communicational approach to empowerment (14 items), motivational approach to empowerment (11 items), and cognitive approach to empowerment (9 items). To check the validity of the questionnaire, it was provided to a panel of professors, the research committee (supervisors and advisors), and educational experts. After making some corrections, it was ensured that the items could be used for measurement. Given the research content and features, the reliability of the questionnaire was estimated with a pilot study in which 30 questionnaires were filled out by 15 trainees and 15 trainers. The validity and reliability of the measurement instrument were checked by content and convergent validity and convergent reliability. The content validity was accomplished by ensuring the consistency of the measurement indicators and the literature, which was achieved by an opinion poll from professors. Convergent validity was measured by the AVE index in which the factor loadings and AVE were >0.5 for all reflective constructs (Hair et al., 2010). Also, the reliability of the questionnaire was determined by two criteria, including the coefficient of Cronbach's alpha and the coefficient of composite reliability (CR). Based on the results, AVE, CR, and Cronbach's alpha were within the appropriate and acceptable ranges. At the next step, structural equations modeling (SEM) was used to analyze the data and examine the relationship between the factors. It should be noted that the data were analysed in the Smart PLS3 and SPSS23 software packages. In addition to descriptive statistics, confirmatory factor analysis and SEM were employed to determine structural validity and model fitness.

3. Results

The results revealed that 57.5% of the trainers with the highest frequency had bachelor's degrees whereas 35% had master's degrees and 7.5% had Ph.D. degrees. The trainers were, on average, 43 years old, 78.4% were male, and 21.6% were female. Also, 36.7% of the trainees were grade 11 students, 33.7% were grade 12 students, and 29.6% were grade 10 students. The average age of the trainees was 16 years with 66.3% being male and 33.7% being female.

In the present study, since the individual indices can act as an indicator of the educational system and empowerment, the third-order factor analysis was conducted, and the research model was tested by studying path coefficients (factor loadings) and factor analysis. The results are reported below.

Based on the results from the perspective of the trainers (Table 4), the educational system of agricultural vocational schools is most strongly influenced by planning and needs assessment (an indicator from the component of management process with a factor loading of 0.873 and R^2 of 0.762), professional training (an indicator from the component of educational process with a factor loading of 0.826 and R^2 of 0.682), analysis of educational strategies (an indicator from the component of curriculum content with a factor loading of 0.680 and R^2 of 0.462), professional competencies (an indicator from the component of technical teacher training and human resource supply with a factor loading of 0.606 and R^2 of 0.368), and physical components (an indicator from the component of the supply of space, equipment, and technology with a factor loading of 0.717 and R^2 of 0.515) (Figure 2). Based on the results from the perspective of the trainees, the educational system of agricultural vocational schools is most strongly influenced by planning and needs assessment (an indicator from the component of management process with a factor loading of 0.738 and R^2 of 0.545), professional training (an indicator from the component of educational process with a factor loading of 0.917 and R^2 of 0.841), appraisal system (an indicator from the component of curriculum content with a factor loading of 0.955 and R^2 of 0.912), professional competencies (an indicator from the component of technical teacher training and human resource supply with a factor loading of 0.940 and R^2 of 0.884), and technology components (an indicator from the component of the supply of space, equipment, and technology with a factor loading of 0.838 and R^2 of 0.702) (Figure 2). Overall, it is understood that all variables have almost strong R^2 and the appropriate fitness of the model is confirmed given the threshold value.

Table 2 - The effectiveness of research indicators in the educational system of empowerment model-based agricultural vocational schools

Dimension	Indicator	Trainers	Trainees
		R^2	R^2
The educational system of agricultural vocational schools	Planning and need assessment	0.762	0.545
	Supplying and organizing resources and facilities	0.638	0.335
	Preparing human resources based on human relations	0.723	0.379
	Monitoring, surveillance, and control	0.585	0.377
	Dual training	0.581	0.819
	Updating knowledge	0.558	0.720
	Professional training	0.682	0.841
	Needs analysis	0.222	0.589
	Analysis of educational objectives	0.365	0.698
	Curriculum content analysis	0.354	0.878
	Analysis of educational strategies and methods	0.462	0.828
	Appraisal system	0.342	0.912
	Teaching methods	0.445	0.648
	Educational competencies	0.352	0.884
	Individual competencies	0.313	0.867
	Professional competencies	0.368	0.690
	Ethical competencies	0.263	0.746
	Physical components	0.515	0.540
	Environmental components	0.464	0.702
	Social communication components	0.407	0.403
Empowerment	Furniture and equipment components	0.404	0.397
	Technology component	0.439	0.530
	Appraisal method	0.494	0.432
	Management solutions	0.760	0.885
	Information and communications technology	0.887	0.844
	Development of participation	0.946	0.887
	Clarification	0.936	0.840
	Human relationships	0.888	0.971
	Commitment	0.951	0.891
	Motivation	0.931	0.917
Model-making	0.782	0.847	
Cognitive dimension	0.785	0.949	
Self-efficacy	0.939	0.955	
Gratitude	0.565	0.666	

Structural equation modeling is a broad and robust multivariate analysis technique of the multivariate regression family that allows the researcher to test a set of regression equations simultaneously. Figure 2 displays the initial measurement model in the mode of the estimation of standard coefficients (PLS-A) for trainers and Figure 3 displays it for trainees. Finally, the overall fit of the models was examined by GOF.

Table 3 - The GOF values for the model from the perspective of trainers and trainees

$$\begin{aligned}
 & \overline{GOF} \\
 & = \sqrt{\overline{communalities} \times R^2} \\
 & \begin{array}{cc}
 \hline
 Trainers & Trainers \\
 \hline
 0.654 & 0.727 \\
 \hline
 \end{array}
 \end{aligned}$$

Wetzels et al. (2009) have defined three values of 0.01, 0.25, and 0.36 as the weak, moderate, and strong values for GOF. The values of 0.654 for the GOF of trainers' model and 0.727 for the GOF of trainees' model reflect the strong overall fit of the research model.

Table 4 - The linear effect of the research variables for testing the research hypotheses

Research hypotheses	Path coefficient (β)		t-value		df		p-value		Result
	Trainers	Trainees	Trainer	Trainee	Trainer	Trainee	Trainer	Trainee	
			s	s	s	s	s	s	
Management process → educational system empowerment	0.264	0.230	7.190	4.667	0.052	0.030	0.000	0.000	Confirmed
Educational process → educational system empowerment	0.101	0.287	3.361	4.617	0.022	0.014	0.000	0.000	Confirmed
Curriculum content → educational system empowerment	0.308	0.237	4.756	3.955	0.003	0.011	0.000	0.000	Confirmed
Technical teacher training → educational system empowerment	0.204	0.185	2.934	2.621	0.012	0.005	0.000	0.000	Confirmed
Supply of space and equipment → educational system empowerment	0.204	0.126	10.703	2.335	0.064	0.066	0.000	0.000	Confirmed

Table 4 shows that the management process, educational process, curriculum content, technical teacher training, and supply of space and equipment had positive and significant effect on the empowerment of educational system in both groups of trainers and trainees.

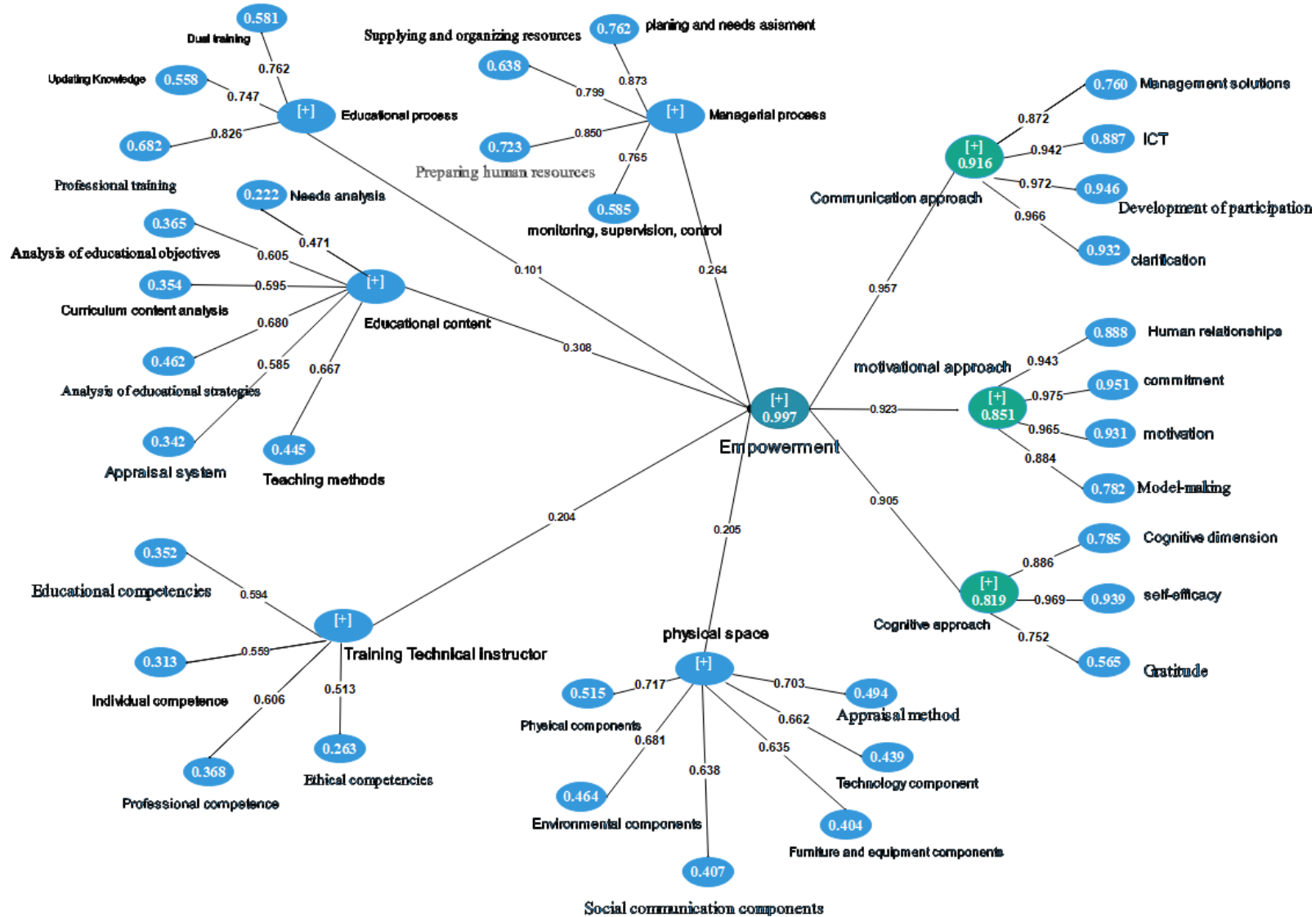


Fig. 2 - The educational system performance empowerment model for agricultural vocational schools from the perspective of trainers

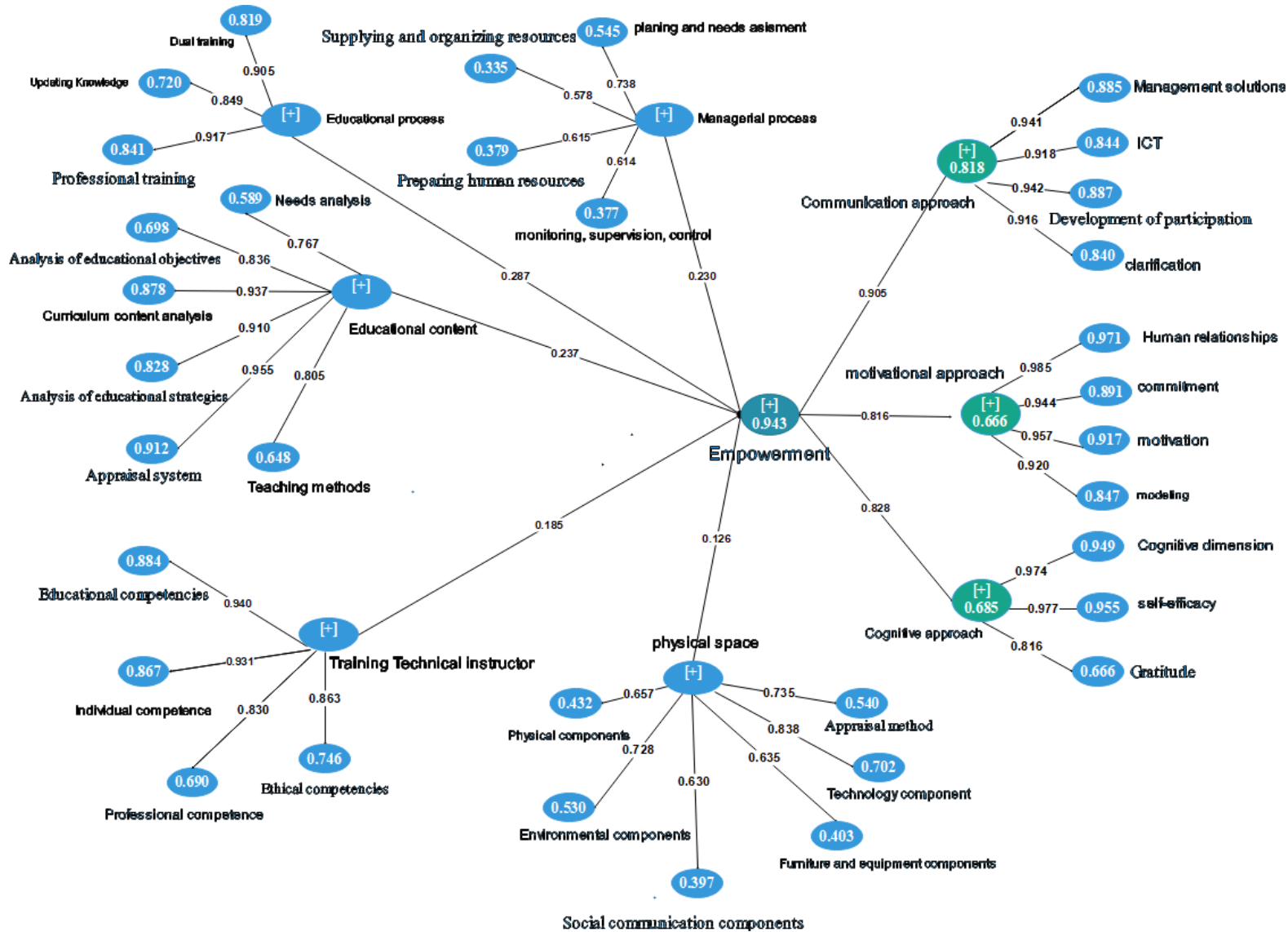


Fig. 3 - The educational system performance empowerment model for agricultural vocational schools from the perspective of trainees

4. Discussion and Conclusion

Education-mediated empowerment as an organizational program can enable the trainers in technical vocational and agricultural vocational schools to increase the trainees' productivity and effectiveness by enhancing their intellectual level. They can also help the trainees apply their knowledge and skills more effectively. Studying the extent to which educational system empowerment indices are achieved via the parameters of the educational system of technical vocational and agricultural vocational schools is one of the most important organizational programs whose sound implementation can provide the educational system with useful information on how to design and fulfil educational programs, which can be an effective basis for the empowerment of the educational system. The educational system should always have a view on the future and prioritize human resources, especially teachers. The success of a provident educational system depends on an all-inclusive model in which the effective dimensions and components of human resource empowerment, as well as the local conditions and requirements of the educational system, are included. The model proposed in this research has adopted a multi-facet approach with a local view. Accordingly, it is comprehensive and can be applied to the educational system of technical vocational and agricultural vocational schools in Iran with a view on the future perspective.

According to the research results, the management process influences the empowerment of an educational system positively and significantly from the perspective of both trainers and trainees. It implies that education and educational management have today an undeniable role to play in the development and progress of all societies and organizations. Essentially, the enhancement of the scientific level of people and dynamism of organizations and their use of innovations is not possible without training and nurturing talented and dynamic people. Even, the enhancement of the economic, social, political, and cultural potential and the prosperity of learning organizations require the development of education and educational management system approaches. Educational management, which aims to facilitate learning in different aspects (learning for knowing, learning for acting, and learning for living and co-living) and nurture responsible and professional citizens, needs acquiring technological, economic, social, intellectual, managerial, leadership, ethical, religious, global and international, personal, research, and cultural competencies. Therefore, the educational tasks and activities and the educational management should be delegated to competent and qualified people. Many scholars (e.g., Blanchard et al., 1996; Cynthia & Jaffe, 1991) have pointed to the critical role of empowering education managers. This finding is consistent with the reports of Bush and Glover (2016), Balkar (2015), Barber et al. (2010), and Birami Erdy et al. (2019).

Both the trainers and trainees believe that the educational process has a positive and significant effect on the empowerment of an educational system. It is drawn from the results that the most important parameter in an educational system is the educational process from the perspective of trainees. In the educational process, the trainers mostly need further training in the fields of educational technologies, material development, guidance, and class management. Also, teachers need to be educated for personal development, e.g., stress control and management, communicational skills, and problem-solving methods. In this respect, trainees need to be trained on such skills as communicational skills (independent learning ability), thinking skills (critical thinking, problem-solving, and creativity), and digital skills. This is in agreement with Gyurova and Zeleeva (2017), Balkar (2015), and Bates (2015).

Both the trainers and trainees suggest that curriculum content influences the empowerment of an educational system positively and significantly. Based on the findings, the most important parameter of an educational system from the perspective of the trainees is the curriculum content. Since the trainers are responsible for teaching, they have placed importance on the curriculum content. When offering the curriculum content to the trainees, it should be considered that a learning environment should not only allow guiding people on the path of learning and making a connection with them but also offer suitable curriculum content and activate the trainees in the teaching-learning process as per the goals of modern teaching methods so that the trainees can learn better and deeper by actively participating in the teaching process. Therefore, after collecting data on the educational system, educational planners can focus on preparing a development plan to transit from the status to the optimal status (Abbasi et al., 2019). This result agrees with the reports of Alimohammadi et al. (2019), Haji Hashemi and Movahedi (2017), and Sobhaninia (2014).

According to the trainers and trainees, the effect of technical teacher training is positive and significant on the empowerment of an educational system. Presently, the development of science and technology has made development in the process of educational activities imperative. The current educational systems should foster people who are capable in the current complicated world and creative in managing and leading this world (Zanganeh et al., 2013). This is consistent with the results reported by Cho and Baek (2019), Li et al. (2018), Balkar (2015), Bates (2015), and Sobhaninia (2012).

The supply of space and equipment is influential on the empowerment of an educational system positively and significantly according to both trainers and trainees. In the educational context, emphasis has always been placed on the significant role of physical dimensions and the appearance of classrooms and schools in the learning process. Indeed, the aesthetic and artistic aspects of educational spaces deeply affect the students' attitude and affection towards teaching and learning (Al-Saleh et al., 2018). Ostapczuk et al. (2012) argue that the educational environment is one of the main determinants in a curriculum. Education experts believe that a proper education and learning environment is one of the most important pillars of quality while a proper educational environment depends on optimal physical, mental, and social climate, as well as human interactions, at the school; i.e., if the school atmosphere is open, creative, and humane, learning

will be continuous, pleasant, and deep (Nouri Hasanabadi et al., 2020). Similar results have been reported by Sar and Misra (2020), Cho and Baek (2019), Iyunade (2014), and Li et al. (2018).

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