Agricultural Teachers' Professional Competency for Working with Students with Special Needs in Iran

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ABSTRACT

The purpose of this study was to identify Professional Competencies (PCs), including General and Specific Competencies (GSCs), of Agricultural Teachers (ATs) working with Students with Special Needs (SSNs), known as exceptional students (1,013 people), in Vocational High School Education System (VHSES) in Iran, within two phases. Accordingly, the main objective of the first phase was to identify General Competencies (GCs) of these teachers. Therefore, in the first phase, the components of teachers' GCs were taken from theoretical literature and research documents via content analysis and the findings revealed that the GCs encompassed 6 components of Instruction Design (ID), Professional Development (PD), Professional Ethics (PEs), cooperation, Perceived Student Diversity (PSD), and technology. The objective of the second phase of this study was also to find Specific Competencies (SCs) of ATs working with SSNs. This phase of the study was conducted using the classical 3-step Delphi technique. In this respect, the specialized Delphi team consisted of 22 ATs working at Iran's Exceptional Schools (ESs), selected through purposive sampling method. Finally, the findings reduced to the identification of 24 SCs for ATs working with SSNs, which were then grouped into two categories of Agricultural Competencies (ACs) and Exceptional Competencies (ECs).

Keywords: General and Specific Competencies, Vocational Teachers, Exceptional Students, Professional Development, Special Education

INTRODUCTION

Although educational opportunities have improved worldwide for SSNs, there are concerns about the preparation of teachers working with this student population (Cooc, 2019). Here, disabilities refer to hearing impairment (including deafness), speech and language disorders, visual impairment (including blindness), behavioral-emotional disturbances, orthopedic disorders, autism, brain damage, as well as other health-related syndromes or special learning problems requiring Special Education (SE) and services (Hopps, 2002). The "SSNs" in this study is meant to describe students who have disabilities (such as physical, emotional, behavioral, or learning disability or impairment) and includes the groups of

"Mental Retardation", "Learning Disabilities", "Several Disabilities", "Physically Handicapped", "Mental Retardation with Autism Spectrum". In this respect, SSNs not only require general education but also academic qualifications, job skills, life skills, and readiness to become a normal member of their communities and get a livelihood in their workplaces (Shawn, 2009). According to the law in Iran, SE (i.e. education for SSNs) is a responsibility assumed by the Special Education Organization of Iran (SEOI, 1990). As a result, there is a total number of 1,500 operating ESs and also 123,000 SSNs, i.e. 73,000 students enrolled at ESs and 50,000 individuals studying at normal schools using integrated education. Moreover, 23,000 teachers are educating

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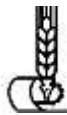
these SSNs and 70 ATs are employed in the exceptional field (SEOI, 2017).

Career and Technical Education (CTE) for SSNs began in the 1990s to 2000s, but it was systematically implemented in SEOI program in 2007. In the 2019-2020 academic year, 1,013 students (48 physically handicapped cases, 16 student affected with visual impairment, 20 individuals with hearing impairment, 12 cases suffering from autism, and 917 students with mental retardation) were studying agricultural sciences in 68 schools (SEOI, 2019).

Preparation of SSNs to get a job after high school is only possible through CTE that allows students to be manually and practically trained in order to successfully enter the job market (Harvey, 2001). Moreover, the diversity of CTE programs helps students to fit their courses to their interests and career goals. The agricultural domain, along with industry and services, are three major parts of the CTE program at SEOI (SEOI, 2017). Thus, Career, Technical, and Agricultural Education (CTAE) prepares SSNs for working after high school. Among the VHSES elements (curriculum, teacher, learner, and context) for SSNs, competent teachers have an undeniable role in the success of this type of education system. Teachers are thus the most important elements of the learning process that are able to fully understand the needs of the SSNs and help them choose their career orientations (Easterly and Myers, 2011). Accordingly, teachers play a crucial role in operationalization and implementation of curriculums. In view of that, achieving organizational goals is related to a number of factors including teachers' PCs, among the most effective ones.

The concept of competency has a long history. It is a personality trait playing an important role in improving individual performance and organizational success that is comprised of knowledge, skills, abilities, as well as other characteristics such as values and innovation (Massey, 2004, Moradi *et al*., 2011). Competency can be considered as a set of knowledge, skills, and attitudes that enables employees to effectively perform their job-related activities based on expected standards (Lauermann and Konig, 2016). Using a comprehensive definition, PCs can refer to teachers' abilities to meet needs and demands of teaching profession in an adequate amount along with an integrated utilization of knowledge, skills, and attitudes; which ultimately lead to improved job performance in individuals (Nijveldt et al., 2005).

The new concept of competency, which refers to sufficient knowledge and proper implementation of specific activities, was raised in the early 20th century in scientific publications (Mulder, 2017). Competencies can thus be divided into GCs or SCS for teachers in different levels of education (CEPPE, 2013).

In general, SE teachers need to have motivation and commitment to education and rehabilitation of the SSNs and also awareness of learners and problems they face. Ultimately, since SE always necessitates group activity of professionals, SE teachers need to have PCs, so they must be endowed with capabilities and prepared to have interactions and get involved in group work in the field of rehabilitation and education (Amin Khandaghi and Kazemi, 2012). ATs as manpower and providers of SEOI program are considered as pivotal elements whose performance is influenced by their success, since they experience special work conditions because of their relationships with SSNs suffering from problems such as mental damage, visual impairment, hearing loss, and, in some cases, a combination of these disabilities. Nevertheless, the majority of these teachers have not been trained to work with SSNs, which can lead to a reduction in job satisfaction and an increase in stress for these individuals who feel extreme pressures to meet all students' needs (Shawn, 2009). It should be noted that; due to the development of some fields in the CTAE for SSNs in Iran since 2007, the SEOI has confronted lack

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and absence of ATs at ESs in many fields of science. Therefore; if the PCs of such ATs are identified and available, authorities and professors can make appropriate decisions during in-service training courses for educating these teachers and turning them into efficient ones, and managers can also make better decisions to recruit teachers with PCs (Alikhani Dadoukolaei et al., 2019). In this context, identifying the PCs of ATs for educational tasks is a vital issue. Although some previous studies have examined qualities and competencies of such teachers, PCs of ATs for SE have been ignored. Therefore, a question is raised that "What are the competencies of ATs while working with SSNs?" Thus, the purpose of this study was to identify PCs (GSCs) of ATs in VHSES for SSNs.

MATERIALS AND METHODS

This study was conducted in two phases. In terms of research paradigm, it was a qualitative study and the first phase was descriptive using content analysis (directed content analysis), so that the components of the GCs of PCs of teachers were extracted from theoretical literature and research documents. In this phase, the main question addressed was; "What are the GCs of PCs of teachers?" Accordingly, the required concepts for research were extracted from the related literature, examined, and then organized into categories. In this regard, sources needed to be studied and reasons for addressing this content were initially discussed. The study population included sources targeting PCs of teachers. The search in the related literature for this review was conducted from February 2017 to December 2018. The sources and scientific databases reviewed included domestic Persian sources (written from 2008 to 2018) and scientific databases (Irandoc, Magiran, and SID) as well as referrals to universities, institutes of higher education, and organizations; and international English sources from academic sites and scientific

databases including ERIC, Elsevier, Springer, and Taylor and Francis. In this search, four sets of terms forming the core concepts of the study were combined as follows:
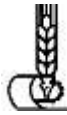
General PC (competency, core competence, key competence, professional skill, professional qualification, professional knowledge, PD, and teaching competence)

Teachers (trainers, teachers, professors, and instructors)

Agricultural education (job training, modular education, vocational training, and CTE)

SSNs (students with disabilities, special students, exceptional students, retarded students, SE, exceptional education, and CTAE for SNNs).

The search for the sources was limited to English (written from 2003 to 2018) and Persian (written from 2008 to 2018) ones. The literature search was also focused on empirical studies, review papers, theoretical background, theses, dissertations, reports, and books. In total, 350 sources were found that covered four sets of search terms and met the mentioned inclusion criteria. These 350 sources were then reviewed for their relationships based on their titles and abstracts and the cases that had not shed light on teachers' competencies were excluded. A collection of 55 sources selected were reviewed by the authors based on their titles, abstracts, and research methods and other cases (ones that had partially evaluated competencies) were crossed out. In total, 20 sources remained (those containing the components of competencies reported as target sample), which were then analyzed using content analysis. In this study, the process of content analysis included several main steps. In the first step, the above-mentioned documents were accurately examined and all the statements expected to derive competencies from were extracted. During the second step, an appropriate categorization method was chosen and there were attempts to represent a distinct variable in each category related to research objectives. Within the third step,

each of the competencies was marked for each category. In other words, each of the competencies extracted from the sources was investigated to determine if the phenomenon described in it fell into one of the categories under consideration or not. In the fourth step, the categories were completed. Accordingly, all the data were considered without any prioritization and then analyzed in several categories and, subsequently, the given competencies were grouped in the form of categories. As the final step, the data were processed.

To assess the validity of the research in terms of the most suitable conditions (rigor, validity, reliability, and trustworthiness) (Elo et al., 2014), several criteria for valid evaluation (content analysis) could be used including 4 criteria of credibility, transferability, dependability, and confirmability (Graneheimab et al., 2017). In this regard, a checklist developed by the first author was used to validate this research. The second and the third authors also reviewed the checklist critically as a review panel. As a result, ambiguities about the exact meanings of the concepts and the definitions used in the sources were clarified by the research team. Then, in order to address the first research question, comprehensive domains of competencies in teachers were identified by connecting and opposing commonalities and differences in competencies described in various sources (article analysis). These domains of competencies were used to build the results section. During this step of analysis, the competencies identified by the research team were discussed, so that an agreement could be reached. All markers were subsequently re-read and assigned to components.

The second phase of the study was qualitative, descriptive, and applied in terms of research paradigm, objectives, and methodology, respectively. A survey method was also used to collect the required information in the form of the classical 3-step Delphi technique. It should be noted that the Delphi is a group-based process to draw, integrate, and receive direct responses to reach a group consensus through a series of steps, maintaining anonymity of respondents and feedback from panel members (Keeney et al., 2001). The specialized panel was comprised of ATs working at ESs and vocational education and skills development experts across Iran. The selected teachers were those who were holding a Master's degree in agriculture (with the sub-disciplines of gardening, herbal medicine, agricultural extension and education, and agricultural machinery) with at least five years of practical experience as trainees in SEOI as well as scientific and experimental expertise in the field of agricultural education for SSNs. The selected experts were those working at the organizational post of an expert in vocational education and skills development for SE in SEOI in provinces with agriculture as a field of study. Additionally, purposive sampling method (due to identification of experts) and snowball sampling were employed to select sample members in the statistical population of the study (n= 22). The required information was collected through a questionnaire whose validity was reviewed by experts in each phase of the study. It should be noted that, when the number of experts (group size) is more than 13 in the Delphi technique, the reliability is estimated to be more than 80% (Dalkey, 1969). The research process in this phase included activities before the start, in the first round, the second round, the third round, decision-making, and approval. Activities before the start embraced a research question and a pre-test for the appropriateness of the words and contacts with the participants. In the first round, an open-ended question was raised to generate a set of responses for use in the second round. In this round, 20 out of the 22 sampled individuals expressed their readiness to cooperate and responded to the first-phase questionnaire. The question in this round was; "What are the SCs of AT's in VHSES when they teach SSNs?" By combining the same cases and reaching an agreement between panel members, 32

competencies were extracted. In the second round, the panel members were asked to identify each of the 32 competencies defined in the first round using a 5-point Likert-type scale (1= Strongly disagree, 2= Disagree, 3= Neutral, 4= Agree, and 5= Strongly agree). In this round, the respondents determined the importance of each item. The third round was then expanded from the results of the second round and the opinions mentioned. The third round was thus used to determine the degree of unity of opinions and group consensus. During this round, the responses received in the second round were ranked. To assess the respondents' agreement, a questionnaire with ordered items (8 competencies were removed and the list of competencies dropped to 24 components) was designed and presented to the respondents and the panel members were then asked to show their agreement or disagreement with each competency. In this round, a total number of 20 respondents who answered the questionnaire in the second round determined the level of agreement for the questionnaires by 80%. Since none of the competencies had a level of agreement less than 80%, no component was deleted. Most Delphi-based studies come to consensus within the third round. In this study, consensus was achieved on 24 competencies. The final rounds were decision-making and approval. Accordingly, the final results were prepared and disseminated, and the experts also shared the results. The data were analyzed using descriptive statistics. The data were also collected using a Likert-type scale and then mean and standard deviation were reported for categorization purposes based on Clason and Dormody (1994).

RESULTS AND DISCUSSION

The first objective of the present study was to review the related literature (Table 1), which led to the identification of 58 competencies within 6 components of ID, PD, PE, cooperation, PSD, and technology as the most frequent and important ones for GCs of teachers, organized and presented in Table 1. According to this table, ID and PD components had the highest number of competencies in the reviews (i.e. 11 and 10 cases; respectively). It should be noted that the component of ID is an important competency for teaching profession. Teachers must thus be good at ID and have specific and general knowledge, familiarity with curriculums and curriculum planning, teaching and thematic-educational competencies, academic counseling, and career advice. They also need to know a variety of teaching techniques and evaluation principles and have capabilities to manage classrooms. Based on the results; tendency to change, desire for flexibility and adaptability, continuous learning, self-regulation, improvement of inter-/intrapersonal skills, self-improvement, improvement of reflexive skills (reflection and critical evaluation of one's work), and sense of self-efficacy are considered as manifestations of PD in teachers.

In the component of PE, teachers should take responsibilities in this regard. Using professionalism, they must thus work in multi-dimensional contexts and work on relationships between professional education, the job market, and community to advance their students in ethical life. According to the results, the competency of "developing educational philosophy (adherence to beliefs, values, and ethics, such as individual integrity and accountability) had been emphasized with the highest frequency in 11 sources, indicating its importance in this dimension. On the other hand, the competency of "commitment to religious values" had been reported in only one source (Iran Ministry of Education, 2018).

With regard to the component of cooperation, the competency of "partnership with parents" and "effective collaboration with stakeholders" with the highest

Table 1. Summary of key information, categorization, and extraction of GCs of PCs of agricultural teachers.

Sources (n=20): (Lindner & Baker, 2003), (Elbert & Baggett, 2003), (Hong et al., 2008), (Instefjord & Munthe, 2017), (Uerz et al., 2018), (O*net, 2018), (Mohamed et al., 2016), (De-Juanas Oliva et al., 2016), (Niemi & Nevgi, 2014), (Zhu & Wang, 2014), (Bakx et al., 2014), (Caena, 2013), (Niemi, 2012), (Manley & Zinser, 2012), (Harlin et al., 2007), (Roberts et al., 2006), (Iran Ministry of Education, 2018), (Dibaei Saber et al., 2017), (Shahriari, 2017), (Karimi, 2009)

Themes	Category / Component	#	Sub-categories/Sub-components/Competencies	Frequency
GCs of PCs	Instruction Design	1	Mastery in ID	4
		2	Familiarity and ability to correctly manage classrooms	8
		3	Knowledge and use of various teaching methods and techniques	9
		4	Specialized knowledge	11
		5	General knowledge (e.g., social, cultural, etc.)	5
		6	Knowledge of curriculums and curriculum planning	5
		7	Educational knowledge (knowledge and skills in teaching processes and using strategies)	8
		8	Thematic-educational knowledge (such as links between previous and new learning)	4
		9	Knowledge of educational counseling and career advice	6
		10	Familiarity and use of evaluation and evaluation methods	4
		11	Evaluation and implementation of teaching processes in accordance with goals	7
	PD (Professional growth and learning)	1	Willingness to change	6
		2	Studying and continuing education for professional growth	5
		3	Ability to do research (conduct research and study)	10
		4	Improvement of reflective skills (reflection and critical evaluation of one' work)	5
		5	Continuous learning and self-regulation	11
		6	Desire for flexibility and adaptability in PD	8
		7	Sense of self-efficacy	3
		8	Improvement of interpersonal skills (communication skills)	9
		9	Improvement of intrapersonal skills (self-awareness)	3
	PE in teaching	1	Developing one's educational philosophy (adherence to beliefs, values, and ethics, such as individual integrity and accountability)	7
		2	Awareness of ethical principles of the teaching profession	7
		3	Commitment and interest in the teaching profession	2
		4	Commitment to lifelong PD	7
		5	Commitment to support students' individual growth	2
		6	Commitment to improve learning for all students	4
		7	Teaching complete personality to students	2
		8	Commitment to respect and division of labor	2
		9	Commitment to religious values	1

Continued of Table 1. Summary of key information, categorization, and extraction of GCs of PCs of agricultural teachers

Themes	Categories / Components	Sub-categories/Sub-components/Competencies	Frequency
GCs of PCs	Teachers' cooperation with others	1. Interactive classroom management	2
		2. Collaborating on evaluation and rating students	2
		3. Assistance in administrative duties (circulars letter, record keeping, student reporting and care)	5
		4. Collaborating with knowledge-based organizations and associations (counseling and supervision)	5
		5. Taking actions during disputes between students (conflict settlement)	5
		6. Collaboration with school staff (new teachers, speech therapists, psychologists, occupational therapists, rehabilitation experts)	8
		7. Collaboration with parents (e.g., encouraging family to follow up)	9
		8. Effective collaboration with stakeholders (colleagues from other fields in social services and community)	9
		9. Willingness to do team work	6
	Perceived diversity and respect for differences	1. Understanding individual differences between learners	9
		2. Teaching that is tailored to the diversity of students	5
		3. Preparing students for life (everyday, occupational)	3
		4. Promotion of gender equality in classroom activities among students	4
		5. Intercultural education and promotion of equality (regardless of age, language, gender, skin color, etc.)	3
		6. Multicultural encounters (familiarity and understanding of cultural differences)	4
		7. Promoting democratic attitudes and behaviors in students as citizens	3
	Technology	1. Technological knowledge/literacy (familiarity)	7
		2. Skills using a variety of technologies (hardware and software)	2
		3. Teaching technology skills (having readiness for technology education)	13
		4. Belief in impact of technology on facilitating teaching (value-added for teaching)	1
		5. Belief in impact of technology on improving learning (value-added for learning)	2
		6. Belief in impact of technology on changing educational practices (value-added for changing educational practices)	1
		7. Promoting technology to facilitate teaching	7
		8. Emphasizing ethical issues related to technology use	1

Sources (n=20): (Karami, 2009); (Shahram, 2017); (Delavar Safaer et al., 2017); (Iran Ministry of Education, 2018); (Roberts et al., 2006); (Harim et al., 2007); (Manley & Zuser, 2012); (Niemi, 2012); (Caena, 2013); (Bakx et al., 2014); (Zhu & Wang, 2014); (Niemi & Nevgi, 2014); (De-Juanas Oliva et al., 2016); (Mohamed et al., 2016); (O'net 2018); (Uera et al., 2018); (Iserbjord & Minuhe, 2017); (Hong et al., 2008); (Elbert & Baggett, 2003); (Lundner & Baker, 2003)

frequency had been underlined in 9 sources. It should be noted that teachers are engaged in a professional work that is based on values of social cohesion. Thus, they need to be aware of human growth and have self-confidence when communicating with others. They are also required to work in a way that enhances collective intelligence of learners and improves their learning and teaching in collaboration with their colleagues, students, and parents. In the component of PSD, the competency of "perceived diversity of students" had been frequently repeated in 9 sources. Moreover, teachers should have competency to work in multicultural contexts; i.e. they need to understand cultural differences and teach everyone and promote equality regardless of age, disability, language, gender, and skin color. The last component was technology, as a prerequisite for teacher training in this modern era. Based on the results, the competency of "educational technology use skills" (having readiness for technology education) had been reported most frequently in 13 sources. In this regard, in line with the 21st century, it is increasingly expected that teachers use technology to support new teaching and learning methods. Furthermore, teachers need to promote technology literacy in their students in order to prepare them for work and learning in the 21st-century community (Uerz et al., 2018).

The second objective of the study was to identify the SCs of ATs for SSNs in accordance with Iran's conditions. According to Table 2 and considering panel members' opinions in the Delphi technique's first round, which began with an open-ended question, 32 competencies were extracted from 20 responses (90% response rate). In this round, the competency of "having extensive knowledge and practical skills in agricultural fields" was ranked the first with 18 responses. "Having patience and high tolerance while teaching practical skills to SSNs" with 15 repetitions was in the second place, and "providing training on practical agricultural activities step-by-step and longitudinally but not in parallel (including

teaching soil tillage, then planting, and then harvesting, etc.) was ranked the third with 12 responses. In the second round, 20 out of the 22 panel members responded (90% response rate). In this round, respondents were asked to specify the significance of the 32 competencies identified in the first round on a Likert-type scale or, if necessary, make changes to their statements. In order to rank the competencies, coefficient of variation was used. According to Table 2 and given the members' opinions, "having extensive knowledge and practical skills in agricultural fields" and "having patience and high tolerance while teaching practical skills to SSNs" were among the important competencies (coefficient of variation of each competency was zero, and also they had the highest mean). It seemed that these two competencies were the priority of the respondents in the first and second phases. It should be noted that, in the first phase, some competencies were out of the viewpoint of some respondents. Also, other discrepancies in the rankings in the second-phase could be due to the effect of remembering them or lack of precision in respondents in the first phase of the study.

In the third round, competencies with mean of 4 or more were retained. Accordingly, 8 items were deleted and 24 were maintained for the next round. In this round, panel members were asked to show their agreement or disagreement with each of the competencies based on the second-round responses. To reach a consensus, the panel members were further requested to explain if they were in disagreement with the competencies or not. A total number of 20 out of 22 panel members responded to the third round (90% response rate). In this round, panel members raised 24 competencies and the level of agreement was 80%. All the respondents (100%) agreed that ATs' competencies while teaching SSNs should include "having extensive knowledge and practical skills in agricultural fields" and "having patience and high tolerance while teaching practical knowledge to SSNs" (Table 2).

Table 2. Levels of agreement, ranking, and classification of PCs (SCs) of ATs in VHSES for SSNs in Iran in the first, second, third phases (n=22).

No.	Competencies	Step 1	Step 2				Step 3	Category	
		Frequency	M [a]	SD	CV	Rank	Agreement percentage [b]	Agricultural	Exceptional
1	Having extensive knowledge and practical skills in the fields of agriculture (ornamental plants, etc.)	18	5.00	0	0	1	100	*	
2	Having patience and high tolerance while teaching to SSNs	15	5.00	0	0	2	100		*
3	Providing training on practical agricultural activities step-by-step and longitudinally but not in parallel (including teaching soil tillage, then planting, and then harvesting, etc.)	13	4.90	0.31	0.06	3	100	*	
4	Paying attention to use of information technology in agriculture and its training to SSNs (for access to job information and job market)	12	4.90	0.31	0.06	4	100	*	
5	Studying medical records of SSNs (physical conditions and diseases, name and time of use of medications)	13	4.85	0.37	0.08	5	100		*
6	Knowledge and analysis of agricultural job opportunities for SSNs (to harmonize educational content with market needs)	8	4.85	0.37	0.08	6	90	*	
7	Tracking to provide educational materials (such as seeds, pots, plants, etc.) before teaching	10	4.85	0.37	0.08	7	95	*	
8	Understanding types of disabilities in SSNs (disabilities, behavioral-emotional disturbances, physical movement disorders, visual impairment, hearing impairment, mental retardation, autism) and awareness of their legal issues	12	4.80	0.41	0.09	8	90		*
9	Recognizing and implementing IVEP for SSNs	9	4.75	0.44	0.09	9	95		*
10	Facilitating the teaching process (simplifying specialized vocabulary, giving simple and shorter assignments, giving extra time, shrinking steps, etc.) for SSNs	8	4.75	0.44	0.09	10	100		*
11	Modifying and adapting practical training instruments and equipment with the help of school rehabilitation staff (building a work desk with suitable height for wheelchair learners, using pots with handles for physically-handicapped students, etc.)	8	4.70	0.47	0.10	11	95		*
12	Simultaneous presentation of theoretical and practical contents in teaching agricultural courses	7	4.80	0.52	0.11	12	95	*	
13	Observing safety and health-related principles in the workplace and teaching it to SSNs (correct use of agricultural equipment, wearing uniforms, gloves, masks, etc.)	8	4.50	0.51	0.11	13	95	*	
14	Paying attention to types of questions in written evaluations (giving short-answer, true-false, multiple-choice, and complete questions) due to the weaknesses of SSNs in reading and writing	3	4.45	0.51	0.11	14	85		*

[a] Mean on a Likert-type scale: strongly disagree (1), disagree (2), neither agree nor disagree (3), agree (4), strongly agree (5). [b] Minimum percentage of acceptable agreement is 80%.

Continued of Table 2. Levels of agreement, ranking, and classification of PCs (SCs) of ATs in VHSES for SSNs in Iran in the first, second, third phases (n=22).

No.	Competencies	Step 1	Step 2				Step 3	Category	
		Frequency	M [a]	SD	CV	Rank	Agreement percentage [b]	Agricultural	Exceptional
15	Putting emphasis on reinforcement of appropriate job-related behaviors in SSNs (e.g. dressing, being interested, caring for equipment, work precision, obedience to teachers, accountability, cooperation, team work, etc.)	8	4.60	0.60	0.13	15	90	●	
16	Having a regular curriculum (lesson plan) on a daily, weekly, and yearly basis for dealing with living entities and budgeting based on a natural calendar according to plant developmental stages	4	4.55	0.60	0.13	16	90	●	
17	Precise monitoring of performance by SSNs and steps involved in agricultural practices to prevent mistakes	4	4.50	0.60	0.13	17	90	●	
18	Having time management (paying attention to time in teaching, timeliness in agricultural activities including planting date, etc.)	5	4.45	0.61	0.13	18	90	●	
19	Use of complementary strategies for learning in SSNs (including repetition and practice, retraining, and placement of strong students along with weak ones in agricultural practices)	3	4.60	0.68	0.15	19	85		●
20	Paying attention to environmental protection in agricultural profession and teaching it to SSNs	2	4.55	0.69	0.15	20	95	●	
21	Planning agricultural activities outside the school (camping, visiting agricultural festivals and exhibitions)	2	4.15	0.67	0.16	21	85	●	
22	Registering and tracking educational, behavioral, and rehabilitation status of SSNs in workshop records to match home and school strategies	2	4.40	0.75	0.17	22	85		●
23	Commitment to work after the end of working hours (due to removal of vital requirements of a plant and its non-compliance with the rules and holidays)	1	4.40	0.88	0.20	24	80	●	
24	Speech and writing comprehension in SSNs (Understanding written information and speech)	1	4.00	1.03	0.26	28	80		●
25	English proficiency to study international sources in the field of agriculture	1	3.55	0.69	0.19	23	-	-	-
26	Understanding common mistakes in SSNs with no fines (including incorrect writing, practical activities, vandalism, etc.)	1	3.90	0.91	0.23	25	-	-	-
27	Managing finances and charity donations in agricultural domain	1	3.80	0.95	0.25	26	-	-	-
28	Having healthy physical organs for agricultural operations (such as physical strength, etc.)	1	3.95	1	0.25	27	-	-	-
29	Using strategies to create quiet and silent classrooms during practical work (such as removing noise pollution (using hands-free) for some students close to the spectrum of autism)	1	3.75	1.07	0.29	29	-	-	-
30	Creating an exciting and vibrant context in greenhouses	1	3.65	1.18	0.32	30	-	-	-
31	Promoting competitive activities and events in workshop environments	1	3.55	1.28	0.36	31	-	-	-
32	Having knowledge of occupational therapy science	1	3.00	1.3	0.43	32	-	-	-

[a] Mean on a Likert-type scale: strongly disagree (1), disagree (2), neither agree nor disagree (3), agree (4), strongly agree (5); [b] Minimum percentage of acceptable agreement is 80%.

With regard to the second-phase objective (organization and categorization of the SCs of PCs of ATs in VHSES for SSNs), all competencies conveying similar meanings and concepts were assigned with the same codes, and similar items were grouped and organized according to the components. As shown in Table 2, finally, SCs of PCs markers for a working model were grouped into two categories, including agricultural competencies and exceptional competencies (those for SSNs). Interestingly, the highest number of competencies was defined in agricultural (14 competencies) and exceptional domains (10 competencies). This belief was to prove that teachers must first master agriculture and then master it in the exceptional domain. According to these findings, 5 competencies (providing training on practical agricultural activities step-by-step and longitudinally; having regular work schedules (lesson plans) on a daily, weekly, and yearly basis due to dealing with living entities and budgeting based on natural calendar according to plant development stages; understanding different types of disabilities in students and knowledge of their legal issues; facilitating teaching process (simplifying specialized vocabulary of agriculture in pamphlets, giving simple and shorter assignments, giving extra time, shrinking steps, etc.); and identifying and implementing Individual Vocational Educational Program (IVEP) for SSNs were significantly consistent with the results of the same studies (e.g. Elbert and Undoubtedly, ATs have many tasks and competencies at the time of teaching for SSNs that are very difficult to distinguish and prioritize. However, in order to facilitate the review of PCs, they can be considered in different components and domains. In this study, 8 PCs for ATs to teach SSNs divided into 8 components and 2 general domains, including GCs (with 54 competencies in six components) and SCs (with 24 competencies in two components) were identified (Figure 1).
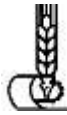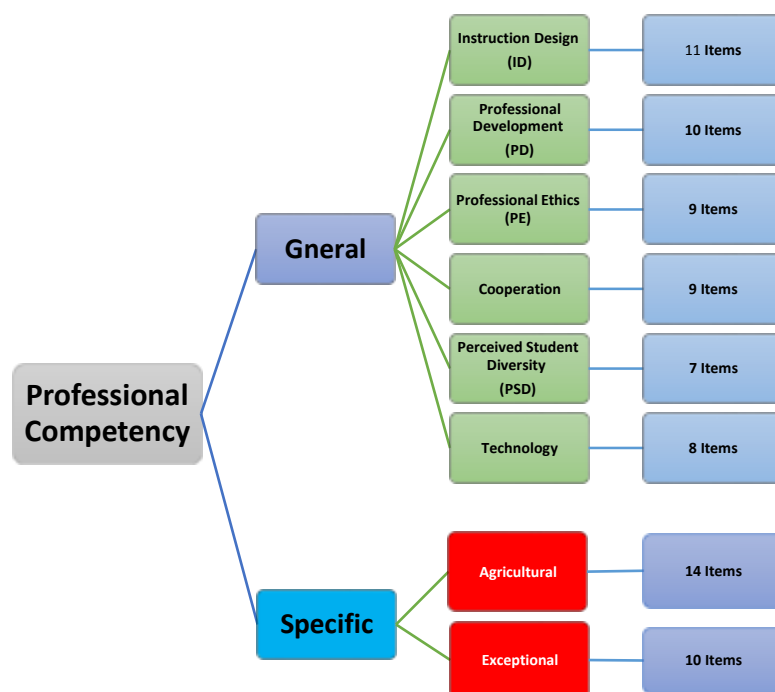

Figure 1. Model of PCs in ATs to teach SSNs.

CONCLUSIONS

The challenge of providing a quality CTAE for SSNs in Iran depends on the training and preparation of ATs. The domains that ATs are working in are different from what they have learned about; moreover, SSNs are increasingly heterogeneous and their needs for support are growing. This study provides new insight into the scope of this challenge, showing that nearly all schools face shortage of ATs with SE competency. In this regard, identification of new competencies related to working with different groups of students was beyond the scope of previous research but was of great importance in this study.

Like all studies, this study had some limitations. One was the constitution of the sample: (1) The number of specialized participants was limited; (2) The responses depended on the respondents' willingness to honestly and reliably recall and report their experiences.

ATs also appear to recognize their own gaps as they expressed high need for agricultural and SE PD. Despite these challenges, there is reason for optimism as well. Effective SE PD may encourage ATs to seek more training, and strong instructional leadership may support the professional needs of teachers .

Overall, the study demonstrated that AT training for working with SSNs is the present and future need in SEOI, and it is necessary to pay attention to the outcomes of this study for long-term stability of SE and agricultural education programs. Therefore, it is imperative to develop learning opportunities to enhance some of these competencies, or use them as a standard for accepting student teachers in teacher training programs. As a whole, it is recommended to evaluate the current ATs to determine their competencies and then develop in-service training programs for the competencies that are lacking. In this regard, it is suggested that ATs be provided with additional training courses or experiences focusing on development of agricultural skills and exceptional domains of teachers' knowledge. The results of this study can be used to plan for pre-recruitment courses to assess the needs of teachers' PD. Educational researchers and managers can also employ the newly identified competencies as a structure for internal evaluation of teachers, since competencies work well as a list of target features and validation of good teaching, thus preventing teacher fatigue and burnout. Most importantly, the identified competencies can provide a common and comprehensible language for all major stakeholders to improve educational outcomes and provide better teacher performance. It is recommended that experimental research be conducted to determine the competency levels of other vocational teachers while working with SSN.

The hope is that these findings will continue to spark urgency across the country to improve recruitment and training of teachers who work with students with special needs and, ultimately, ensure that the right to an education for this population includes both access and quality.

REFERENCES

1. Alikhani Dadoukolaei, M., Chizari, M., Bijani, M. and Abbasi, E. 2019. Strategies for Physical Environment Improvement of Horticultural Education for Students with

Special Needs. *Agric. Educat. Administr. Res.* **11(50)**: 3-18. (in Persian)

2. Amin Khandaghi, M. and Kazemi, S. 2012. National Plan of Evaloation of Vocational Training Curriculum of Students with Special Needs (Mental Retardation) in Secondary Schools in Special Education Organization of the Islamic Republic of Iran. Research Institute for Educational Studies, Exceptional Children's Research Institute. (in Persian)

3. Bakx, A., Baartman, L. and van Schilt-Mol, T. 2014. Development and Evaluation of a Summative Assessment Program for Senior Teacher Competence. *Stud. Educ. Eval.*, **40**: 50-62.

4. Caena, F. 2013. Supporting Teacher Competence Development for Better Learning Outcomes. European Commission, Education and Training.

5. Centre of Study for Policies and Practices in Education (CEPPE). 2013. Learning Standards, Teaching Standards and Standards for School Principals: A Comparative Study. OECD Education Working Papers, Chile, Paris, 99 PP.

6. Clason, D. L. and Dormody, T. J. 1994. Analyzing Data Measured by Individual Likert-type Items. *J. Ag. Ed.*, **35(4)**: 31-35.

7. Cooc, N. 2019. Teaching Students with Special Needs: International Trends in School Capacity and the Need for Teacher Professional Development. *Teach. Teach. Educ.*, **83**: 27-41.

8. Dalkey, N. C. 1969. The Delphi Method: An Experimental Study of Group Opinion. The Rand Corporation, Santa Monica.

9. De-Juanas Oliva, A., Martin del Pozo, R. and Pesquero Franco, E. 2016. Teaching Competences Necessary for Developing Key Competences of Primary Education Students in Spain: Teacher Assessments. *Teach. Dev.*, **20(1)**: 123–145.

10. Dibaei Saber, M., Abbasi, E., Fathi Vajargah, K. and Safaei Movahed, S. 2017. Explaining the Components of the Professional Competency of Teachers and the Education of Its Position on Documents in Iran. Training and Learning Researches (TLR), **13(2)**: 109-123. (in Persian)

11. Easterly, R. G. and Myers, B. E. 2011. Inquiry–Based Instruction for Students with Special Needs in School Based Agricultural Education. *J. Ag. Ed.*, **52(2)**: 36-46.

12. Elbert, C. D. and Baggett, C. D. 2003. Teacher Comptence for Working with Disabled Students as Perceived by Secondary Level Agricultural Instructors in Pennsylvania. *J. Ag. Ed.*, **44(1)**: 105-115.

13. Elo, S., Kaariainen, M., Kanste, O., Polkki, T., Utriainen, K. and Kyngas, H. 2014. Qualitative Content Analysis: A Focus on Trustworthiness. SAGE Open, **4**: 1-10.

14. Graneheimab, U. H., Lindgrena, B. M. and Lundmana, B. 2017. Methodological Challenges in Qualitative Content Analysis: A Discussion Paper. *Nurse. Educ. Today*, **56**: 29-34.

15. Harlin, J. F., Grady Roberts, T., Dooley, K. E. and Murphrey, TH. P. 2007. Knowledge, Skills, and Abilities for Agricultural Science Teachers: A Focus Group Approach. *J. Ag. Ed.*, **48 (1)**: 86 – 96.

16. Harvey, M. W. 2001. Comparisons of Postsecondary Transitional Outcomes between Students with and without Disabilities Secondary Vocational Education Participation: Findings from the National Longitudinal Transitional Study. *Career Develop. Exception. Individuals*, **25**: 99-121.

17. Hong, J. C., Horng, J. S., Lin, C. L. and ChanLin, L. J. 2008. Competency Disparity between Pre-Service Teacher Education and In-service Teaching Requirements in Taiwan. *Int. J. Educ. Dev.*, **28(1)**: 4–20.

18. Hopps, W. N. 2002. A Comparison of Special and Regular Education Teachers' Knowledge of Laws and Policies on Inclusion. Doctoral Dissertation, The South Carolina State University, USA.

19. Iran Ministry of Education (IME). 2018. General and Professional Competencies of Teachers. No Published. (in Persian)

20. Instefjord, E. J. and Munthe, E. 2017. Educating Digitally Competent Teachers: A Study of Integration of Professional Digital Competence in Teacher Education. *Teach. Teach. Educ.*, **67**: 37–45.

21. Karimi, F. 2009. A Study of the Professional Competencies of General Education Teachers and Presentation of an Appropriate Conceptual Framework. Doctoral Dissertation, Islamic Azad University, Science and Research Branch, Tehran, Iran (in Persian).

22. Keeney, S., Hasson, F. and McKenna, H. P. 2001. A Critical Review of the Delphi Technique as a Research Methodology for Nursing. *Int. J. Nurs. Stud.*, **38(2)**: 195-200.

23. Lauermann, F. and Konig, J. 2016. Teachers Professional Competence and Wellbeing:

Understanding the Links between General Pedagogical Knowledge, Self-efficacy and Burnout. Learn. *Instruct.* **45**: 9-19.

24. Lindner, J. R. and Baker, M. 2003. Agricultural Education Competencies: A Comparison of Master Students at TEXAS TECH and TEXAS A&M Universities. *J. Ag. Ed.*, **44(2)**: 50-60.

25. Manley, R. A. and Zinser, R. 2012. A Delphi Study to Update CTE Teacher Competencies. *Educ. Train.*, **54(6)**: 488-503.

26. Massey, L. C. 2004. A Framework for Building Management Capability in New Zealand. *J. Small. Bus. Enterprise. Dev.*, **11 (2)**: 13- 22.

27. Mohamed, Z., Valcke, M. and De Wever, B. 2016. Are They Ready to Teach? Student Teachers' Readiness for the Job with Reference to Teacher Competence Frameworks. *J. Educ. Teach.*, **43(2)**: 151–170.

28. Moradi, H., Bijani, M., Shabanali Fami, H., Fallah Haghighi, N., Tamadon, A. R. and Moradi, A. R., 2011. Analysis of Effective Components on Professional Development of Agricultural Extension Agents in Kermanshah Province in Iran. *Int. J. Food. Agr. Env.*, **3&4(9)**: 803-810.

29. Mulder, J. 2017. Competence-based Vocational and Professional Education. Bridging the Worlds of Work and Education. Springer International Publishing, Switzerland.

30. Niemi, H. 2012. Relationships of Teachers' Professional Competences, Active Learning and Research Studies in Teacher Education in Finland. *Reflecting Educ.*, **8(2)**: 23-44.

31. Niemi, H. and Nevgi, A. 2014. Research Studies and Active Learning Promoting Professional Competences in Finnish Teacher Education. *Teach. Teach. Educ.*, **43**: 131-142.

32. Nijveldt, M., Mieke, B., Douwe, B., Nico, V. and Theo, W. 2005. Assessing the Interpersonal Competence of Beginning Teachers: The Quality of the Judgment Process. *Int. J. Educ. Res.*, **43(1-2)**: 89–102.

33. O*net. 2018. Available at: https://www.onetonline.org/link/summary/25 -2031.00.

34. Roberts, T. G., Dooley, K. E., Harlin, J. F. and Murphrey, T. P. 2006. Competencies and Traits of Successful Agricultural Science Teachers. *J Career Technic. Educat.*, **22(2)**:1-11.

35. Special Education Organization of Iran (SEOI). 2017. Annual report of the Special Education Organization of Iran. (in Persian).

36. Special Education Organization of Iran (SEOI). 2019. (in Persian).

37. Special Education Organization Law (SEOL). 1990. Islamic Consultative Assembly of Iran. 6, 1, 675. Annual report of the Special Education Organization of Iran (in Persian).

38. Shahriari, A. 2017. Identifying the Professional Competencies of Teachers of Exceptional Schools in Shiraz and Providing a Way to Improve. M.Sc. Thesis in Educational Management, University of Tehran, Iran (in Persian).

39. Shawn, S. K. 2009. Identifying Confidence Levels and Instructional Strategies of High School Agriculture Education Teachers When Working with Students with Special Needs. Doctoral Dissertation, The North Carolina State University, USA.

40. Uerz, D., Volman, M. and Kral, M. 2018. Teacher Educators' Competences in Fostering Student Teachers' Proficiency in Teaching and Learning with Technology: An Overview of Relevant Research Literature. *Teach. Teach. Educ.*, **70**: 12-23.

41. Zhu, C. and Wang, D. 2014. Key Competencies and Characteristics for Innovative Teaching Among Secondary School Teachers: A Mixed-Methods Research. *Asia Pacific Educ. Rev.*, **15(2)**: 299-311.

صلاحیت حرفه‌ای آموزشگران کشاورزی موقع کار با دانش‌آموزان با نیازهای ویژه در ایران

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چکیده

هدف این مطالعه، شناسایی صلاحیت حرفه‌ای (PC) (صلاحیت‌های عمومی و تخصصی (GSC) آموزشگران کشاورزی (AT) موقع کار با دانش‌آموزان با نیازهای ویژه (SSN) در نظام آموزش متوسطه حرفه‌ای (VHSES) در کشور ایران بود که در دو مرحله انجام گرفت. هدف مرحله اول شناسایی شایستگی‌های عمومی (GC) آموزشگران بود. در گام اول با بهره‌گیری از روش تحلیل محتوا، مؤلفه‌های شایستگی‌های عمومی (GC) آموزشگران از متون نظری و سوابق پژوهشی استخراج گردید. نتایج نشان داد که GC آموشگران شامل شش مؤلفه طراحی آموزش (ID) ، توسعهٔ حرفه‌ای (PD) ، اخلاق حرفه‌ای (PE) ، همکاری، درک تنوع دانش‌آموزان (PSD) و فناوری می‌باشد. هدف دوم تحقیق، شناسایی شایستگی‌های تخصصی (SC) آموزشگران کشاورزی موقع کار با SSN بود. این مرحله از پژوهش، با استفاده از فن دلفی کلاسیک در سه فاز انجام گرفت. گروه تخصصی دلفی، شامل 22 نفر از آموزشگران کشاورزی شاغل در مدارس استثنایی (ES) ایران بود که با بهره‌گیری از روش نمونه‌گیری مبتنی بر هدف، انتخاب شدند. حاصل این مطالعه، شناسایی 24 صلاحیت تخصصی مورد نیاز آموزشگران کشاورزی موقع کار با SSN بود که در دو طبقه شایستگی‌های حوزه کشاورزی و شایستگی‌های حوزه استثنایی می باشد.