

Identifying and Ranking the Professional Qualifications of Secondary School Teachers in the Heutagogy Approach

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Abstract

Purpose: This research was conducted with the aim of identifying the professional competences of secondary school teachers in the Heutagogy approach.

Methodology: The research method was descriptive-survey and the statistical population was 520 secondary school teachers in Eslamshahr. The sampling method was available, which was selected using Morgan's table. The questionnaire was completed online, and 178 secondary school teachers completed the questionnaire. The research tool was a researcher-made questionnaire with 37 items on a Likert scale, which was designed in two sections of teachers' professional qualifications in heutagogical curriculum and in heutagogical educational constructs. Cronbach's alpha coefficient for the questionnaire in the curriculum was 0.85 and educational constructs was 0.93. The collected data were identified using exploratory factor analysis and Friedman and Chi-square test were used to rank and check the difference in ratings.

Results: The results obtained from the research showed that: expansion of teacher facilitation, student learning, student participation, and non-linear planning and evaluation are the priority factors of heutagogical curriculum in order of priority. Systemic thinking in education, teacher's capability to learn, creating internal motivation and creating deep learning are priority factors of heutagogical educational constructs.

Conclusion: The heutagogy approach as an underlying theory and intellectual and philosophical basis can help future curriculum designers. In the heutagogical curriculum, the roles of teachers change; teachers need to acquire the skills of facilitation, learning how to learn, planning and non-linear evaluations and actively involving the students in the classrooms.

Keywords: Professional Competence, Heutagogy, Curriculum, Educational Constructs

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Introduction

In today's society, man must be the creator of his own knowledge and achieve synergy with participation, cooperation and collective wisdom. By developing the ability of "how to learn", learners can transform information into knowledge. In the view of modern educational approaches, the linear curriculum does not meet the needs of today's learners, and each learner must determine his own learning path. In these changing and complex conditions, it is necessary to use flexible methods. According to Roman (2021), flexible learning is an educational approach that allows flexibility among teachers, learners and the learning environment (Roman, 2021). In today's complex and non-linear world, the heutagogy approach or self-determination learning leads to dynamic experiences in learning processes (Hase, 2009). The heutagogy approach emphasizes the development of learner abilities, the active role of the learner, the choice of learning by the learner, attention to the learner's learning experiences (Hase & Kenyon, 2003), the learner's autonomy and self-determination in learning, developing the learner's capacity and capability, and its goal is to educate learners who prepare for the complexities of today's work environments (Blaschke, 2012).

In the design of heutagogical curriculum, the choice of content and learning methods is the responsibility of the learner, and the teacher, in the role of facilitator and guide, helps the learner in choosing the content, learning method and assessment methods. In this approach, learning contracts are set, which are mainly learner defined that help learners define and determine individual learning methods. In these individual contracts, the content to be learned, the learning method, the content to be assessed and the assessment method are specified (Hase & Kenyon, 2013). Heutagogy provides opportunities for learners to take responsibility of their learning process; negotiate and learn through communication systems in online learning environments; have access to a wide range of resources and choose their own learning resources; by expanding their capabilities, they can effectively and efficiently learn by themselves and achieve deep learning. In this view, the learner constantly needs to rethink his learning, and it is necessary to provide such a creative opportunity to the learners with flexibility in content, process and time curriculum (Shafiee, 2018). In educational systems, the teacher should control learning processes and facilitate self-determination learning by using new and creative teaching approaches and methods. The professional competences of teachers are among the influencing factors on expanding the capacity and ability of self-determination of learners in this field.

A teacher's competence is his ability to meet the needs and demands of the teaching profession and the integrated use of knowledge, skills and attitudes (Niknami and Karimi, 2009). The professional competence of a teacher refers to the set of knowledge, tendencies and skills that a teacher can acquire in the course of education to help the physical, intellectual, emotional, social and spiritual development of learners, which are classified in three cognitive, emotional and skill areas (Maleki, 2012). As the most influential people, teachers should equip their teaching with new skills and knowledge and always try to improve their teaching competences in accordance with scientific and educational developments in order to meet the growing needs of students and society. Therefore, professional teachers should learn new methods and techniques and consider the teaching profession as a dynamic and continuous process and welcome it (Mehrmoammadi, 2001).

Heutagogy

Hyotagogy is an approach that focuses on self-determined learning, double-loop learning, capability development, non-linear design, learner-centered, exploration and understanding of how learners learn (Canning & Callan, 2010). In regard to the affinity of the concept of pedagogy with andragogy and Heutagogy, these three concepts are briefly compared.

Pedagogy or teacher-led learning is a content model based on information transfer in which the teacher

is the decision-maker and determines what the content is and how to transfer it. Pedagogy is a theory about teaching (Conner, 2006). Pedagogy is the art and science of teaching children, which takes place in a gradual and continuous process. The goal of pedagogy is to transfer the content to the learner and the teacher is the main decision-maker about learning (Mehman Doost Ghamsari, 2019).

Andragogy or self-directed learning means "the art and science of helping adults learn" (Shafiee, 2013). In this view, the learner's experiences are an important source of learning, the learner is guided towards social tasks in learning; the educational process is problem-oriented and performance-oriented. The teacher's responsibility is to guide learners to self-management and facilitate the learning process by providing resources and guidelines to adult learners, informing them about problem solving methods, and matching the knowledge and skills of learners with the knowledge and skills required for different jobs. In andragogy, the teacher designs and implements the curriculum according to the needs of the learners (Mehman Doost Ghamsari, 2019).

Heutagogy or self-determined learning is learner-centered and is derived from the word "heuristic" and means a method of teaching that gives learners the opportunity to discover. The basis of heutagogy is the theories of Carl Rogers, Vygotsky, constructivism, systems thinking and complexity theory (Abili & Mazari, 2021). In the heutagogy approach, curriculum and learning should be flexible; in this approach, teachers provide curriculum and learning resources, and learners make decisions about lesson plans and learning activities according to their goals and interests; they explore and study by themselves and formulate evaluation tasks through discussion and negotiation (Durrani & BagherianFar, 2014). Heutagogy, while following the principles of andragogy, is completely different from it. Heutagogy is distinguished from andragogy with special emphasis on learning how to learn, double-loop learning, non-linear process and development of capabilities. While andragogy emphasizes content learning, single-loop learning, linear process and development of competencies, learning methods and structured teaching, but heutagogy emphasizes educational initiative to improve real learning skills by the learner himself, which can be provided outside the framework of the curriculum and cover all the fields of learning (formal and informal) (Hase & Kenyon, 2013). In fact, heutagogy is a new educational development that can be an evolutionary step towards teaching "how to live" in today's complex world (Bhoryrub et al., 2010).

Blaschke and Hase (2015) define the five principles of heutagogy theory as such:

- *Learner-centered and learner-determined*: The role of human agency in learning is a fundamental principle. The learner is at the center of all heutagogic practice. The learner is self-motivated and autonomous. The learner determines "content" and "how" of learning
- *Capability*: being able to use one's competencies in unfamiliar as well as familiar circumstances, self-efficacy, communication, creativity, collaboration and participation, and positive values.
- *Self-reflection and metacognition*: The learner reflecting not only what she or he has learned, but also the way in which it has been learned—and understanding how it is learned.
- *Double-loop learning*: The learners are engaged in learning both psychologically and behaviorally. They reflect on their learning and learning methods, identify and pursue new learning paths.
- *Nonlinear learning and teaching*: Learners determine the different paths, processes and programs of knowledge and skills required. As a result of learners choosing their own path, learning happens in a nonlinear format.

According to Blaschke and Hase (2015), six basic elements in the design of heutagogical programs are:

Explore: Here the learners need to be able to develop and test hypotheses, and ask and answer question.

Create: This can be achieved using a variety of learning approaches, e.g., writing, designing, drawing, and creating mind maps.

Collaborate: here the learners can learn from each other, work together toward a common goal, solve problems and reinforce their knowledge.

Connect: It is through the connections that new avenues of learning can be created.

Share: By sharing information with each other, learners are able to learn from each other's discoveries and experience.

Reflect: This reflective activity should include reflecting on the new knowledge that the learner has gained, as well as how she or he has learned—and the ways in which this learning experience has influenced his or her value system and beliefs.

In heutagogical thinking, the characteristics of curriculum elements include:

-Flexible curriculum: The program should be designed according to the different learning needs of learners, and learners discuss and decide on "how", "when", and "where" and "quality level" of their desired learning. Objectives, resources and results are not fixed; the choice of learning content and assessment method is through negotiation; learner-generated content emphasizes the free choice of the learner and the active cooperation of the teacher and the learner, the preparation of content is not everything, and the emphasis should be on learning processes and learning methods (Lee & McLouglin, 2007).

-Facilitation in learning: When designing a self-determined learning program, the facilitator and the learner agree with the learners on the time frame for learning, the method used, the number of progress reports, the form of the final assessment. Facilitator's role is to clarify the learning goals, to guide the learners in raising self-directed questions, to exchange the opinions about learning ideas and experiences with learners and to provide the feedback and necessary knowledge about learning activities (Hase & Kenyon, 2013), to review the qualitative level of learners' progress at regular intervals, to self-evaluate continuously and to design the new curricula (Dick, 2013).

-Heutagogical assessment: Evaluation tasks are determined through discussion and negotiation; continuous and participatory evaluation follows a learning experience (Shafiee, 2018) and a win-win evaluation process (Durrani & Bagherianfar, 2014).

-Heutagogical learning environment: Learning environments are complex and teachers need a complex combination of knowledge, performance, skills and attitudes to function effectively in challenging, unpredictable, and complex learning environments (Shafiee, 2018).

Educational Constructs

Hase and Kenyon (2013) consider the educational constructs of heutagogy as follows:

- Understanding the complexity and systemic thinking: understanding the complexity of future systems emphasizes on these factors: the dynamic nature of learning; acquiring the ability to understand the moment; understanding the relationships and interactions between phenomena; the ability to recognize and open to serendipity, coincidence and accident; the ability to discuss and think critically and persuasion; the diversity and agility of thought; and the ability to cope with ambiguity and competing ideas (Hase & Kenyon, 2003). System thinking is a method for holistic view; it is a conceptual framework to create the clearer patterns for effective performance of activities (Salavati et al., 2014). Systemic thinking is a high-level thinking skill and one of the complex cognitive processes that analyzes issues with the aim of achieving a complete and comprehensive understanding that can be taught with appropriate and competent curricula. Acquiring systemic thinking skills in universities can provide the foundations for the development of systemic thinking and the ability to understand the complexities of the current society in people (Assaraf & Orion, 2010). Shafiee et al. (2019) say that the identifying and understanding interconnections (understanding interconnections and non-linear links between components in a whole), evaluation and decision-making (understanding complexity and logical inference when making decisions), foresight (expanding the horizon of vision and understanding the dynamics of behavior in time frame), identifying and understanding the feedback (recognizing cause-effect relationships and links and

understanding their ways of influencing behavior) and modeling and using a model (designing a model of relationships between variables and understanding its application in practice) are the characteristics of people with systemic thinking.

- **Capability to learn:** Capability to learn is one of the constructs emphasized in the heutagogy approach, which uses the works of Stephenson and his colleagues (1992 and 1998) in the field of "capability". Capability is changing in the sense of having real confidence in one's ability to act effectively and appropriately with the aim of adjusting solutions and solving problems in similar and dissimilar situations (Cairns, 2000). Capability at the individual level refers to the ability to engage with emerging environmental changes and respond differently but sensibly over time (Woods et al., 2015). Learning capability is the ability to recognize the moment of learning, which leads to the development of self-efficacy in learning and how to learn and monitoring the learning processes. In the competency-based curriculum, the learner is equipped with personal, scientific and professional growth and independently tries to develop his capabilities and creates a strong link between theory and practice through reflection and in-depth observation (Hase, 2000).

- **Internal motivation:** In the heutagogy approach, internal motivation is considered an emotional commitment to learning and an important necessity for learners (Shafiee, 2018). According to the principles of heutagogy, guiding the cognitive activities during learning requires the emotional and motivational investment, and intrinsically motivated people always seek new knowledge and expand exploratory capacities for learning (Hase & Kenyon, 2013). According to Canning (2013), the learner with emotional investment engages a complex set of arguments and circumstances, and engages with personal reflection in the learning process, which is actually highly individual.

- **Deep learning approach:** In the heutagogical view, learning in the first two main levels is actually the acquisition of knowledge and skills or "competency" that pedagogy and andragogy best describe this level of learning (Hase, 2009); The second level is "deeper learning" and includes complex neural interactions; at this level, it is not possible to predict all learning experiences, and the needs and motivation of the learner change rapidly; This type of learning is more permanent (Hase & Kenyon, 2013). In the deep approach, the real understanding of the learned material is emphasized and the desire to extract meaning leads to an active learning process, and learners go to the course content with interest and internal motivation and search for coherence between the components of the assignments (Zandavani-Naeni et al., 2014). According to Hase and Kenyon (2007), real learning is a process which is different from just acquiring knowledge and skills; It is actually very deep or a kind of "reconceptualization" (cited by Cochrane and Narayan, 2014).

Abili and Mazari (2021) in presenting the heutagogical model of self-development in the electronic platform, point to the three key dimensions of person-centered, learning-centered and learner-centered. In the person-centered dimension, the components of self-awareness, self-activity, self-reliance and self-motivation are discussed; in the learning-centered dimension, the components of self-learning, self-direction, and self-determination of learning are emphasized, and in the learner-centered dimension, the components of self-regulation, self-monitoring, and self-evaluation of the learner are placed. Mehman Doost Ghamsari (2019) introduces the philosophy of complexity and the underlying theory of heutagogy from the dimensions of curriculum philosophy. Gupta and Gupta (2022), in their heutagogical study, consider the orientation of the future education system to be multidisciplinary education, flexibility in curricula, integration of professional education with a blended learning approach and development of lifelong learners; they believe that higher education institutions should adopt the philosophy of heutagogy to cope with challenges. Hamdan et al. (2021) in the study of mobile heutagogy point out that due to extensive changes in educational systems, especially in the conditions of epidemic diseases, students and teachers must face the challenges of learning outside the classroom and choose the mobile heutagogy as

an educational framework. Wong et al. (2020), in the study of mobile heutagogy, concluded that using a new learning tool arouses curiosity, interest in learning, and increases the self-confidence in students. Also, mobile heutagogy leads to the improvement of student participation in the learning process and learning discussions, which results in a better understanding of learning concepts. Based on the study of Bansal et al. (2020), andragogy and heutagogy create more independence and self-management in learning, and self-motivated and self-determined professional learners promote learning productivity through personalization and collaborative actions.

Professional Qualification of Teachers

Qualification refers to a set of knowledge, skills, abilities and attitudes in a specific job that allows a person to achieve success in performing tasks. The qualification of a teacher is: the ability to apply integrated knowledge, skills, ability and attitude in carrying out the activities of the teaching profession. Maleki (2012) refers to cognitive, emotional, and practical skills. Raouf (2007) considers the following to be the qualifications of a professional teacher: mastery of one's specialized field and knowledge of existing global knowledge; the ability to explain the content to the audience and use their thinking; appropriate and correct beliefs about society, people and their behaviors; positive beliefs about oneself; appropriate and consistent beliefs about the purposes and goals of society, school, classroom, personal and professional goals; achieving self-discovery and finding individual creative and productive ways. Karimi (2013) considers teachers' professional qualifications as follows: behavioral-cognitive, educational, professional development, professional ethics, management, technology, teaching, personality and intellectual qualifications. Teaching standards articulate the knowledge, skills and attributes of good teachers and as such are often linked to the pursuit and achievement of professional autonomy (Phelan & Vintimilla, 2020).

Tarafi et al. (2020) say that the professional development of teachers requires the development of flexible programs that are realized through the participation of teachers in the development of content elements, goals, teaching-learning strategies and evaluation. Alimohammadi et al. (2019) in the research topic of professional empowerment of future teachers, consider the following items as teacher's professional skills: increasing the skills, specialized and general abilities of teaching, strengthening learning management and research literacy, holding training classes in accordance with future needs, scientific innovation and familiarizing learners with the skills to deal with emerging challenges. Nafeei (2016) says that students' perception of teachers' professional qualifications has an effect on their motivation and academic progress. Handiyani et al. (2021) point out in their heutagogy research that improving teacher competencies requires learning self-determination, metacognitive reflection, participation and capacity development. Havery et al. (2019) propose the continuous professional development of teachers as a strategy to respond to the growing changes in the teaching profession. Avalos (2011) says that the professional development of teachers is a complex process that happens through the application of self-determined learning approaches. In reviewing the skills needed for educational systems in the 21st century, Wrahatnolo (2018) mentioned the following: life planning, flexibility and adaptability, initiative and self-management, entrepreneurship, social and cultural interaction, productivity and accountability, leadership, critical thinking, Problem solving, communication, collaboration and teamwork, lifelong learning and digital literacy. Bates (2015) while investigating the digital era teaching, considers the most important professional skills of teachers as follows: communication skills (ability to learn independently, ethics and responsibility), thinking skills (critical thinking, problem solving and creativity), digital skills and knowledge management. Selve (2010) mentions these things in the professional competence of teachers: field competence (teaching), research competence (research techniques), educational competence (educational design), lifelong learning

competence (commitment to learning and growth), socio-cultural competence (knowledge and understanding the student's social and cultural background), communication competence (communication competence, observation competence, listening competence and verbal competence), environmental competence (attitude towards environmental issues), emotional (teacher's knowledge and awareness of values, attitudes, motivation and ethics related to oneself or the students, competency of information and communication technology (using education tools and sharing knowledge and information) (as cited in Nafeei, 2016). Chacko (2018), in the research on the new emerging education for learning, concluded that a beginner must go through the path of participation based on the heutagogy approach to become a professional learner.

In the heutagogical approach, the traditional role of teachers is changed, and in the process of partnership with the learner, teachers design curricula and play different roles, such as: negotiated assessment and learning, helping to make learning choices, helping learners to ask self-directed questions, continuous review, learning progress and activities, providing feedback and conducting continuous self-assessment. Therefore, it is necessary to identify teachers' qualifications in the heutagogy approach, because teachers' professional qualifications are an influential factor in students' self-determination learning.

The research results show that few researches have been conducted in the field of heutagogy as an approach in educational systems, and this field requires the collection of valid evidence on the effectiveness of heutagogy in education. Also, research findings conducted in fields related to heutagogy such as lifelong learning, higher education, learning with the help of digital technologies, distance learning, school education, teaching methods and professional training show that heutagogy can be used in these fields, but the evidence empirically obtained is limited.

It should be noted that secondary school students spend the last years of a 12-year academic course and at the end of this course they enter complex work and life environments, so acquiring self-determination skills in learning is of great importance. On the other hand, the existence of teachers with heutagogical qualifications can help these students in realizing this important goal. Conducting research in this area is a small step to answer the questions of educational officials about the way of presenting curricula in view of the changes and transformations of educational and learning environments, changing the roles of teachers and students, changing the forms of relationships and social interactions in learning environments, and changing educational stages and steps. Is. Therefore, the current research aims to identify and prioritize the professional qualifications of secondary school teachers in the curriculum and educational constructs of the heutagogy approach. In line with the purpose of the research, two questions were proposed:

- What are the professional qualifications of secondary school teachers in the heutagogy approach curriculum and what are their priorities?
- What are the professional qualifications of secondary school teachers in the constructs of heutagogy approach and what are their priorities?

Methodology

The present research method is descriptive-survey. The statistical population included 520 teachers of second secondary education in Eslamshahr. The sampling method was available and the number of samples was selected based on Morgan's table, based on which 178 questionnaires were completed and analyzed. Data collection was from library and field source and a researcher-made questionnaire was used. Before the final implementation of this questionnaire, its validity and reliability were checked. In this regard, the basic concepts and scientific texts related to the principles and features of the curriculum and the facilitation-learning competencies in the heutagogy approach were examined and a list of items was prepared. The items were examined and compared in a group of three experts. After removing

incomprehensible and similar items, 59 items were selected. The items were compiled in the form of an initial questionnaire in two parts of curriculum and educational constructs. This 59-item questionnaire was given to 5 experts to check its content validity. After experts' opinions were examined and compared, a 37-item questionnaire - 17 items were related to teachers' professional qualifications in the heutagogical curriculum and 20 items were related to heutagogical educational constructs - was formed on a five-point Likert scale. Cronbach's alpha coefficient calculated for this questionnaire in the curriculum section was 0.85 and in the educational construct section, it was 0.93.

In order to identify the components, exploratory factor analysis was performed using the principal components method with varimax rotation; this factor analysis was by principal components method with varimax rotation. After the factors were identified, the average values and standard deviation of each factor were calculated. Friedman's test was also used for ranking and chi-square test was used to check the difference between the rankings. Data analysis was done using SPSS software.

Results and Discussion

Table 1 shows the demographic characteristics of 178 teachers participating in the study. This table is based on gender, education and teaching experience.

Table 1. Demographic characteristics of the participants

	Gender		Education			Teaching Experience		
	Female	Male	B.A	M.A	Ph.D	less than 10 years	11 to 20 years	more than 20 years
Frequency	153	25	75	92	11	34	52	92
Percent	86	14	42.1	51.7	6.2	19.1	29.2	51.7

First question: What are the professional qualifications of secondary school teachers in the heutagogy approach curriculum? What is the priority of these qualifications?

To answer this question, exploratory factor analysis was performed. In checking the initial suitability of the data, the KMO test was obtained with a value of 0.76, which is higher than 0.6 and shows the adequacy of the sample size. Bartlett's index, whose value is $\chi^2=520.11$, is significant at a level less than $p<0.001$. This index showed sufficient correlation between items for factor analysis. In practice, 17 items were included in the factor analysis, one item had a share of less than 0.4, which was removed, and 16 items that had a high and suitable share were placed under 4 factors.

Table 2. Communalities, Estimate, Eigenvalues and Total Variance with Varimax rotation

Item No.	Items	Communalities	Estimate	Eigenvalues	Variance
10	<i>The teacher selects and formulates the educational goals with the participation of the learner through negotiation.</i>	.734	.757	3.76	19.79
15	<i>The learners constantly evaluate themselves.</i>	.770	.722		
13	<i>Learning resources are jointly determined by the teacher and the learner.</i>	.614	.680		
3	<i>The teacher should devote an active and decisive role to the student in all stages of the lesson planning.</i>	.601	.619		
12	<i>The teacher should consider himself a facilitator of the learning process.</i>	.623	.715	2.85	17.41
7	<i>The teacher should use different learning resources.</i>	.601	.711		
8	<i>The teacher must provide the required information for the students without time and place restrictions.</i>	.629	.693		
16	<i>The teacher must use virtual education technologies in learning.</i>	.550	.658		
11	<i>A teacher must teach the students how to learn.</i>	.796	.794	2.26	14.16
5	<i>The teacher should give the learners the opportunity to assess in real situations and provide feedback.</i>	.581	.709		
4	<i>The teacher should choose the learning opportunities according to the characteristics of the students.</i>	.684	.635		
6	<i>The teacher should design the educational content based on the professional needs with the cooperation of learners.</i>	.656	.627		
2	<i>The teacher should transform the intrapersonal tacit knowledge into interpersonal explicit knowledge by continuous evaluation and feedback to the learner.</i>	.669	.791	1.66	10.37
1	<i>The teacher should use the non-linear planning process in the curriculum planning of the educational environment.</i>	.585	.767		
14	<i>The teaching process should be learner-oriented.</i>	.605	.673		
9	<i>The teacher should train self-determining learners.</i>	.574	.506		

According to Table 2, the items related to the factors had a factor load greater than 0.4 and the eigenvalue of all factors was higher than one, the explained variance of each factor was higher than 4%, and 4 items were included in each factor. Therefore, the factor loadings calculated for each of the factors are favorable and satisfactory. The factor loadings of the questions and the percentage of variance explained for each component show its validity. According to the content of the constituent items, the factors were named as: the components of teachers' professional qualifications in the heutagogical curriculum.

The factors were named according to the items: the first factor with a specific value of 3.76, which explained 19.79% of the observed variances, was named "student participation"; the second factor with a specific value of 2.85, which explained 17.41% of the observed variances, was named "teacher facilitation extension"; the third factor with a specific value of 2.26, which explains 14.16 percent of the observed variances, was named "teaching the students how to learn"; the fourth factor with an eigenvalue of 1.66, which explained 10.37% of the observed variances, was named "nonlinear planning and evaluation". In total, by performing exploratory factor analysis, 16 items were placed under 4 factors that explained 61.73% of the total variance; these factors can be among the professional qualifications of teachers in the heutagogical curriculum. Friedman test was used to check the professional qualifications of teachers in heutagogical curriculum.

Table 3. Mean, Standard deviation and Mean Rank

Factors	Mean	Std deviation	Mean Rank	Rank
Expanding the teacher facilitation	16.57	2.28	3.04	First
Teaching the students how to learn	16.62	2.09	2.94	Second
Student participation	15.54	2.61	2.24	Third
Nonlinear programming and evaluation	15.03	2.32	1.79	Fourth
	$X^2=67.72$	DF=3	Sig=.001	

According to Table 3, The significance of Chi-square at the alpha level of 0.001 shows that the rating of teachers' professional qualifications in the heutagogical curriculum is significant. The highest average rank is assigned to the teacher's ability to expand facilitation in the classroom. In other words, the most important factor for to implement the heutagogical curriculum in classrooms is the teacher's role of facilitation. Teaching the students how to learn was ranked second and this is one of the main and important topics in the heutagogy approach. Participation of students in classrooms was ranked third. Planning and non-linear and evaluation was also ranked fourth, which can be said that from a heutagogical point of view, it is not possible to achieve the desirable educational and the educational goals with linear planning, but it is necessary that educational planning, teaching-learning and evaluation processes follow a non-linear process.

Second question: What are the professional qualifications of secondary school teachers in the educational constructs of the heutagogy approach? What is the priority of these qualifications?

In order to answer this question, exploratory factor analysis was performed. In checking the initial suitability of the data, the KMO test was obtained with a value of 0.87, which is higher than 0.6 and shows the adequacy of the sample size. Bartlett's index, whose value is $x^2=1021.87$, is significant at a level less than $p<0.001$. This showed sufficient correlation between items for factor analysis. In practice, 20 items were included in the factor analysis, and 3 items with a share of less than 0.4 were removed. Again, the remaining 17 items were included in the factor analysis, and these items had a high and appropriate share of commonality and were placed under 4 factors.

Table 4. Communalities, Estimate, Eigenvalues and Total Variance with Varimax rotation

<i>Item No.</i>	<i>Items</i>	<i>Communalities</i>	<i>Estimate</i>	<i>Eigenvalues</i>	<i>Variance</i>
17	<i>The teacher should think about long-term goals in teaching-learning programs</i>	.795	.812	3.69	21.37
21	<i>To achieve success, the teacher must examine various factors.</i>	.761	.759		
26	<i>The teacher must extract the required information from various sources.</i>	.698	.743		
23	<i>The teacher should establish a relationship between different subjects while teaching.</i>	.652	.742		
18	<i>The teacher should pay attention to the different dimensions and features in providing the educational activities.</i>	.716	.719		
24	<i>The teacher must organize his learning programs.</i>	.779	.836	3.17	18.26
25	<i>The teacher must consider himself obliged to develop his skills.</i>	.682	.822		
22	<i>The teacher should always check the effect of his behavior in the classrooms.</i>	.790	.707		
20	<i>The teacher should pay attention to all the influencing factors while deciding to learn.</i>	.693	.631		
33	<i>The teacher should arouse the curiosity of the learner in the presentation of the course material, even if it is difficult to learn the material.</i>	.854	.808	2.68	15.47
32	<i>The teacher should make the classes challenging.</i>	.731	.781		
34	<i>The teacher should give students the opportunity to choose learning activities for learning, even if their learning is not a guarantee of getting a good grade.</i>	.686	.702		
31	<i>The teacher should pay attention to creating a sense of inner satisfaction in students towards studying the subjects.</i>	.719	.624		
28	<i>The teacher should create questions in the student's mind.</i>	.661	.718	2.54	14.93
29	<i>The teacher should deepen the learning of the material by giving assignments for outside the school.</i>	.650	.714		
19	<i>The teacher should use the concept maps to provide solutions to the problems.</i>	.614	.665		
30	<i>The teacher should pay attention to the suggested reading materials related to class topics.</i>	.682	.636		

According to Table 4, the items related to the factors had a factor load greater than 0.4 and the eigenvalue of all factors was higher than one, the explained variance of each factor was higher than 4%, and there were 5 items in the first factor, and in the other factors, 4 items were included. The factor loadings calculated for each factor are favorable and satisfactory; the factor loadings of the items and the percentage of variance explained for each component show its validity. The factors were named according to the content of the constituent items as: the components of teachers' professional qualifications in the heutagogical curriculum.

The factors were named according to the items: the first factor with a specific value of 3.69, which explained 21.37% of the observed variances, was named "system thinking in education"; the second factor with an eigenvalue of 3.17, which explained 18.26% of the observed variances, was named "teacher's

learning capability"; The third factor with a specific value of 2.68, which explained 15.47% of the observed variances, was called "creating internal motivation"; the fourth factor with an eigenvalue of 2.54, which explained 14.93% of the observed variances, was called "creating deep learning". In total, by performing exploratory factor analysis, 17 items were placed in 4 factors, which explained 70.03% of the total variance; these factors can be among the professional qualifications of teachers in heutagogical educational constructs. Fredman's test was used to check the rating of teachers' professional qualifications in heutagogical educational constructs.

Table 5. Mean, Standard deviation and Mean Rank

Factors	Mean	Std deviation	mean Rank	Rank
Systemic thinking in education	21.53	2.74	3.95	First
Teacher's learning capability	17.38	2.37	2.18	Second
Creating internal motivation	16.87	2.70	2.01	Third
Creating deep learning	16.88	2.40	1.87	Fourth
$X^2=174.78$		DF=3	Sig=.001	

According to Table 4, the significance of chi-square at the alpha level of 0.001 shows that the rating of teachers' professional qualifications in heutagogical educational constructs is significant. The highest average rank is assigned to the competence of the teacher's systemic thinking in classroom teaching. That is, the most important factor in heutagogical educational constructs is dedicated to the system thinking ability of teachers in carrying out educational activities. Systemic thinking is one of the main educational constructs in the heutagogical approach, which is recommended to teachers and emphasized in the teaching of systemic thinking to students. Based on the teacher's learning capability, it can be said that the teacher must be an active learner and expand his learning abilities before he performs his teaching role. Intrinsic motivation and deep learning are two important components in self-determined learning, and students become self-directed by having these characteristics in teaching and learning activities.

The first question, which dealt with the identification and ranking of the professional qualifications of secondary school teachers in the heutagogical curriculum, respectively identified the qualifications of "expanding teacher facilitation", "student learning", "non-linear planning and evaluation" and "student participation". These qualifications indicate the changing role of teachers in new educational constructs. In line with the results of the current research, Canning and Callan (2010) point out these factors in self-determination learning: non-linear design and emphasis on learning methods, learner-centered and exploration and understanding how to learn by learners. According to Tarafi et al.'s opinion (2020), the professional development of teachers requires the development of flexible programs that are achieved through teachers' participation in the development of content elements, goals, teaching-learning strategies and evaluation. In explaining the heutagogical curriculum Shafiee and Bakhshimanesh (2019) say that educational systems must have the necessary dynamics and make changes in the program processes and educational-learning activities along with educational technological developments; curricula should be flexible; the role of research facilitation and guidance should be strengthened; and the role of the learners and their active participation in the curriculum should be emphasized specially.

In this regard, it can be said that factors such as extensive scientific and knowledge changes and developments, the formation of extensive social networks and access to various information in a short time, the wide range of learning resources and the need to acquire the necessary knowledge for the current diverse and complex environments, have created new conditions for teachers. In teaching-learning processes, teachers can no longer rely on information transfer to prepare students for life and work in today's changing society; so they should change their roles according to the new requirements and follow the processes of facilitation, learning, non-linear and collaborative programs and evaluations. Therefore, the professional identity of teachers should be reconstructed seriously. John et al. (2003) say that today's

society has moved from the mandatory provision of education to focusing on the quality of education, and the new curriculum reforms emphasize the development of learners' skills, how to learn, curriculum development, and the use of diverse teaching strategies. Such changes also require a change in the teacher's role (John et al., 2003). In fact, the teacher function as a guide and assistant to the learner, and the active performance of this role requires the acquisition of new knowledge and skills. In such a learning environment, the student takes responsibility for his own learning and tries to expand his knowledge and share it with others by actively seeking knowledge.

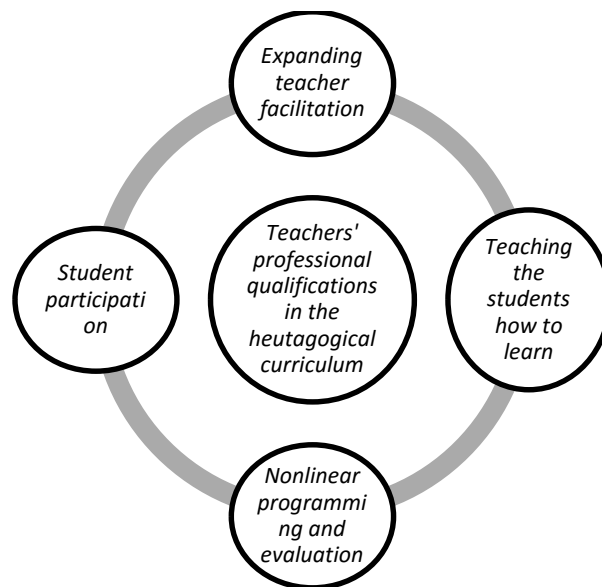


Figure 1. Teachers' professional qualifications in the heutagogical curriculum

Expanding Teacher Facilitation: In the review of prioritizing teachers' professional qualifications in the curriculum, "Expanding Teacher Facilitation" was ranked first. In line with this result, Hase and Kenyon (2013) and Bhoryrub (2010) emphasize that in a heutagogic learning environment, the role of teachers is to facilitate learners' progress. Dick (2013) also points out the role of facilitating teachers and providing learning guidelines and continuous monitoring of the qualitative level of students' progress. In explaining this finding, it can be said that in terms of the heutagogy approach, teachers in a flexible curriculum provide learning resources and through a collaborative process with the learner, they provide the necessary guidelines to the learner for curriculum design; the facilitator's role is to ensure that learners have received the necessary instruction and that learning outcomes have been optimal.

Teaching the students how to learn: The second factor of teachers' professional competence in the curriculum is "teaching the students how to learn". In this regard, Hase and Kenyon (2013) and Bhoryrub (2010) say that in the heutagogical learning environment, emphasis is placed on creating competencies in the learner and developing the learning capacity and ability of the learners. Blaschke and Hase (2015) say that in the heutagogy approach, the learner should reflect on "what he learned" and "how he learned". Also, Abili and Mazari (2021) in the discussion of self-development heutagogical model point to three key dimensions "individual-centered", "learning-centered" and "learner-centered". Blaschke and Hase (2015) also consider "learner-centeredness" and "self-directed learning" and the principle of "human agency in learning" and "the learner's role in determining the content and manner of learning" as an important principle in the heutagogy approach. In general, it can be said that heutagogy is a learning approach and emphasizes the learner-centeredness. What students need to learn in classrooms is "how to learn" and the role of teachers is to educate and educate students in the field of learning.

Involving students in the design, implementation and evaluation processes are regarded as the professional qualifications of teachers in the heutagogical curriculum. In this context, researchers in the field of heutagogy emphasize the following: the participation of learners in group discussions and having the opportunity to express feelings, experiences and ideas (Canning & Callan, 2010); formation of learning teams (Hase & Kenyon, 2013); sharing resources and supporting learners' participation in the learning process (Blaschke, 2012), active participation of learners in the assessment process and choosing different forms of assessment tasks (Hase & Kenyon, 2013). Based on this, the learner is considered as the central point and the basis of the design of the teaching-learning process from the beginning to the assessment of learning (Agonacs & Matos, 2019). In this regard, it can be said that collaborative learning is an important part of heutagogical classes. Teachers and students prepare and adjust the learning content with intellectual-scientific cooperation; learners work with each other in a collaborative space and jointly create meaning and think and reflect with each other about the content, learning method and how to apply what they have learned.

Non-linear planning and evaluation of teachers' professional qualifications were recognized in the heutagogical curriculum. In this context, Canning and Callan (2010) emphasize nonlinear design and double-loop learning in the discussion of self-determination learning; Blaschke and Hase (2015) also consider the non-linear teaching-learning and double-loop learning as heutagogical principles. Also, Hase (2009) says that heutagogy is a form of self-determination learning; it's a very dynamic experience in a very complex, non-linear and ever-changing world. In this regard, it can be said that the current learning environments are challenging, unpredictable and complex, which present new requirements in designing, planning, teaching and learning; therefore, it is not possible to achieve the desired learning goals with linear programming. In such complex environments, it is necessary to have a dynamic learning and increase the learner capacities to understand and evaluate complex interactions between the phenomena so that planning and evaluations in educational systems are non-linear.

The second question dealt with the identification and ranking of the professional qualifications of secondary school teachers in the educational constructs of the heutagogy approach; in this question, qualifications such as "system thinking in education", "teacher's learning capability", "creating internal motivation", "creating deep learning" were respectively identified. According to Hase and Kenyon (2013), the heutagogy approach emphasizes the concepts of understanding the complexity and having "system thinking", "learning capability", "intrinsic motivation" and "deep learning"; these characteristics are developed in a constructivist and flexible learning environment. Shafiee (2018) in explaining the self-determination curriculum says that in the curricula of educational systems, paying attention to new approaches that respond to the needs of the current society is a requirement; in this system, learners should be trained in a way that they have the capability to learn, and the ability to understand the complexities of society; they should also be able to manage their learning processes and scientific and intellectual growth; in this system, the curriculum should be flexible and the skills of exploration and self-determined acquisition of knowledge should be strengthened. Handayani et al. (2021) point to things such as self-determination learning, metacognitive reflection, participation, and capability development to improve the teacher's heutagogical competencies. According to Avalos (2011), professional development of teachers is a complex process that occurs through the application of self-determined learning approaches.

In this regard, it can be said that it is a necessity to design curricula that are able to create opportunities for the growth of multiple capacities and capabilities. Since the transfer of raw knowledge to students does not meet their needs in the current complex and evolving society, it is necessary to provide the conditions and fields for students' growth and their abilities should be strengthened from the intellectual dimension and system thinking on various environmental-social issues, so that students are encouraged to learn deeply and strive for growth and progress in the future. Teachers should also develop and expand their

scientific knowledge with a forward-looking and researching look and search for knowledge.

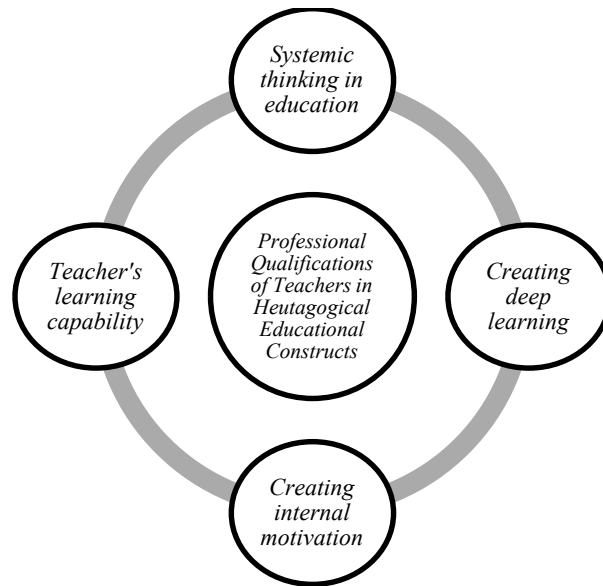


Figure 2. Professional Qualifications of Teachers in Heutagogical Educational Constructs

Systemic thinking in education: In the review of the prioritization of teachers' professional qualifications in educational constructs, "systemic thinking in education" was ranked first. The intellectual founders of the heutagogy approach (Hase & Kenyon, 2013) emphasize on understanding complexity and acquiring systems thinking skills. According to Assaraf and Orion (2010), systemic thinking is a high-level thinking skill and is a complex cognitive process that can be taught with appropriate and competent curricula. According to the results of the study of Assaraf and Orion (2010), the combination of systems thinking training programs with students' curricula leads to improvement and progress in learning. In another study, students who received materials on the systems thinking approach, compared to students who did not receive materials on this subject, had a better understanding of the dimensions of the subject being taught (Duangploy & Shelton, 2000). In explaining this finding, it can be said that nowadays systemic thinking is an urgent need for people to understand complexities (Plate, 2010); we need people who can respond appropriately in a complex society and pursue scientific innovations for the future, while also being able to understand complex interrelationships. Therefore, it is important to design the system thinking curricula that can meet the different needs of learners. With this description, teachers with systemic thinking can create the foundations for the development of systemic thinking and nurture the ability to understand complexities in students.

The teacher's learning capability is the second factor for the professional qualification of teachers in educational constructs. According to Hase and Kenyon (2013), "learning capability" is one of the important constructs of heutagogy approach that teachers and students should have. Blaschke and Hase (2015) consider the capability to apply skills in new and unfamiliar situations as one of the principles of heutagogy. Competency-based educational program causes personal, scientific and professional growth of people and should be included in the educational systems of teachers and students (Hase, 2000). Nikolovaska et al. (2019) emphasize that in order to achieve self-determined learning; learning capabilities must be identified and cultivated. According to Stephenson (1998), in educational systems, the learners should be helped to identify their learning needs, design a suitable program for learning, question and negotiate the content, prepare and use appropriate resources, achieve progress and plan the next steps of their growth (Stephenson & Yorke, 1998). Creating such a capacity in learners requires the learner teachers who have high learning capability. Teachers who have the capability to learn, by studying and trying, search for new knowledge, expand their knowledge capacity, follow their goals with awareness and

clarity, and purposefully design and implement new educational-learning programs. Educational systems can ensure the quality of students' learning by institutionalizing the capability to learn among teachers. In other words, the teacher must be an active learner and expand his learning capabilities before he starts his teaching role.

- Creating the internal motivation is one of the professional qualifications of teachers in educational constructs. The intellectual foundation of self-determination is that humans have an inherent and internal desire to behave and learn (Hase & Kenyon, 2013). According to the self-determination theory, people have a natural and internal tendency to grow, be curious, and pursue challenging activities. Intrinsic motivation is spontaneously derived from psychological needs, curiosity, and innate efforts to grow (Reeve, 2015). Intrinsic motivation is based on the need for a person to be effectively self-determining and to have a meaningful impact on his environment (Hejazi et al., 2015). Wong et al. (2020) also consider the use of new heutagogic learning tools and techniques to be effective in arousing curiosity and interest in learning and increasing students' self-confidence. In this regard, it can be said that motivation is one of the main components of learning and students with internal motivation continuously strive to learn and develop their learning abilities and capacities and consciously plan and implement their learning and become self-determining learners in learning. In other words, with their emotional investment, the students can actively engage in reasoning and thinking processes and improve the quality level of their learning. One of the important roles of teachers is to "create internal motivation" in students so that they follow learning processes in a self-determined manner.

Creating deep learning is one of the professional qualifications of teachers in educational constructs. According to Hase and Kenyon (2007), real learning is a process different from mere knowledge and skill acquisition, which is very deep and, in other words, it is a kind of "reconceptualization". According to Barros et al.'s study (2013), "deep processing" is related to goal setting and self-direction in learning. According to Wang et al. (2020), mobile heutagogy leads to improved student participation in the learning process and learning discussions, which results in a better understanding of learning concepts. In this regard, it can be said that students with a deep approach are interested in the lesson; and curiously they seek to understand the content and the relationships between the components of the learning content, and actively process the course content, and integrate the new learned concepts into the broader framework of personal experiences and cognitive construction; the assignments are attractive to them, and the implicit meaning of the content is more than Verbal meanings emphasize; the strategy of these students is to learn by understanding the meaning and concept of the learning materials, and their goal is to achieve a personal meaning from the learning tasks. It should be noted that in the classrooms, students are influenced by teachers' teaching and evaluation systems, they should be aware that they emphasize on the connection and creation of new concepts and involve students with issues and concepts in evaluations and opportunities to use deep learning approach strategies for students.

Conclusion

According to the results of the research and considering the wide scientific and technological scope as well as the need to acquire knowledge to face the wide changes in the society, educational systems need flexible curricula that respond to new conditions. The heutagogy approach as an underlying theory and intellectual and philosophical basis can help future curriculum designers. What the current research clearly identified was that in the heutagogical curriculum, the roles of teachers change; teachers need to acquire the skills of facilitation, learning how to learn, planning and non-linear evaluations and actively involving the students in the classrooms. Acquiring these professional skills and qualifications on the part of the teachers requires systematic planning by the officials of educational systems so that teachers can be taught

new heutagogical roles in practical service programs. In this context, Farhangian University plays an essential role, because learning these roles in a long-term program will have a higher quality level.

- Considering the necessity of "expanding teacher facilitation", it is suggested that, while examining the current desired abilities and characteristics of teachers in this field, in-service training courses on "heutagogic teaching facilitation techniques" should be designed and implemented for teachers.

- In the component of "Learning and Teaching to the Student", it is suggested that in special educational programs about learning styles, these are considered: cognitive and meta-cognitive techniques, in-class research methods and creating questioning among students.

- Engaging the students is an important element in the heutagogical curriculum. Therefore, it is necessary for students to participate in the entire process of design, implementation and evaluation. So it is suggested that in the curriculum, student participation in all processes is included, so that students have the opportunity to critically evaluate the current curriculum and provide new solutions.

- The non-linear planning and evaluation component is an important issue in the heutagogy approach and according to the complexities of the current era, learning the skills and techniques of this type of planning is a necessity for teachers. Therefore, it is suggested to design and implement non-linear planning and evaluations for teachers in workshop and operational training programs.

In the second discussion of educational constructs emphasized by heutagogy, i.e. "system thinking", "learning capability", "internal motivation" and "deep learning", the main orientations are indicative of the educational processes in the future educational systems, which should be considered in the design of curricula. Based on the findings of the present research, a teacher who has the capability of system thinking, who is an active learner himself, can better play educational and educational roles and make students interested in learning and help them in a deeper understanding of knowledge.

-Regarding the need for teachers to have systemic thinking in carrying out the educational processes, it is suggested that workshop programs related to acquiring systemic thinking skills be presented to teachers including the knowledge of phenomena and relationships between them, evaluation of factors and phenomena, knowledge of cause-effect relationships, modeling, decision-making and forecasting and foresight skills. Teachers with a broad horizon can better prepare students for a better life in the future society.

- Based on teachers' capability to learn, it is suggested that along with teachers' educational programs, learning programs should be scheduled and scientific and research resources should be provided to teachers so that they can use the resources in different situations. Designing the specialized libraries for teachers in schools is very effective, and in-service education systems should design and implement the educational programs to strengthen the learning capability of teachers.

-Considering the competence of creating internal motivation, it is suggested that teachers increase the sense of satisfaction and internal motivation in students by holding attractive and challenging classes and giving students the opportunity to choose learning content.

-Considering the qualification of creating deep learning in students, it can be said that the main step to create deep learning in students is that teachers first learn the skills and techniques of deep learning and use these techniques in the teaching process and give the students the opportunity to understand learning experiences deeply.

In connection with the suggestion for future researches, it can be said that the approach of heutagogy as an underlying theory of education in the 21st century requires a wider and more practical study. In other words, in order to apply the intellectual and philosophical concepts of heutagogical, it is necessary to conduct extensive studies in different departments and levels of educational systems. Therefore, it is recommended to the researchers to investigate the operational solutions of this approach at different levels

of education and all levels of education. The limitations of the present research are: the bias of the answers and limiting the research to secondary school teachers, which limits the generalizability.

References

- Abili, K., & Mazari, E. (2021). Providing a Heutagogical Self-Development Model in the Electronic Context (A Model for Leadership of Learning). *Encyclopedia of Digital Transformation*, 2(1), 1-17. DOI: 10.22034/dtj.2021.293786.1016 (In Persian)
- Agonács, N., & Matos, J. F. (2019). Heutagogy and self-determined learning: a review of the published literature on the application and implementation of the theory. *Open Learning: The Journal of Open, Distance and e-Learning*, 34(3), 223-240. Doi:10.1080/02680513.
- Alimohammadi, G., Jabbari, N., & Niazazari, K. (2019). Professional empowerment of teachers in the future perspective along with a model. *Quarterly Journal of Education Innovations*, 18(1): 7-32. Doi:10.22034/JEI.2019.88531 (In Persian)
- Assaraf, O. B. Z., & Orion, N. (2010). Systems thinking skills at the elementary school level. *Journal of Research in Science Teaching*, 47(5), 540-563.
- Avalos, B. (2011). Teacher professional development in teaching and teacher education over ten years. *Teaching and teacher education*, 27(1), 10-20.
- Bansal, A., Jain, S., Sharma, L., Jain, C., & Madaan, M. (2020). Students' Perception Regarding Pedagogy, Andragogy, and Heutagogy as Teaching–Learning Methods in Undergraduate Medical Education. *Journal of Education and Health Promotion*, 23, 1-7.
- Barros, R., Monteiro, A., Nejmedinne, F., & Moreira, J. A. (2013). The Relationship between students' approach to learning and lifelong learning. *Psychology*, 4(11), 792-797.
- Bates, A. W. (2015). Teaching in a digital age. Open Educational Resources Collection. 6. Available at: <https://irl.umsl.edu/oer/6>.
- Bhoryrub, J., Hurley, J., Neilson, G. R., Ramsay, M., & Smith, M. (2010). Heutagogy: An alternative practice based learning approach. *Nurse Education in Practice*, 10(6), 322-326.
- Blaschke Lisa M., & Hase, S. (2015). Heutagogy: A Holistic Framework for Creating Twenty-first Century Self-determined Learners. The future of ubiquitous learning. *Lecture Notes in Educational Technology*, Springer, Berlin, Heidelberg. <https://www.researchfate.net/publication/280717279>
- Blaschke, L. M. (2012). Heutagogy and lifelong learning: A Review of heutagogical practice and self-determined learning. *The international review of research in open and distance learning*, (IRRODL), 13(1), 56-71.
- Cairns, L. (2000). The process outcome approach to becoming a capable organization. *Sydney: Australian Capability Network Conference*, 1-14.
- Canning, N. (2013). Practitioner development in early years' education, self-determined learning: Heutagogy in action.
- Canning, N., & Callan, S. (2010). Heutagogy: Spirals of reflection to empower learners in higher education. *Reflective Practice*, 11(1), 71-82.
- Chacko, T. V. (2018). Emerging pedagogies for effective adult learning: From andragogy to heutagogy. *Archives of Medicine and Health Sciences*, 6(2), 278-285.
- Cochrane, T., Narayan, V. (2014). Cultivating creative approaches to learning. *Experiences in self-determined learning*, 149-170.
- Conner, M. (2006). Andragogy and pedagogy. Ageless Learner. Retrieved March 26, from: <http://www.agelesslearner.com/intros/andragogy.html>.
- Dick, B. (2013). Crafting learner centered processes using action research and action learning. self-determined learning: Heutagogy in action.
- Duangploy, O., & Shelton, M. L. (2000). Using a systems approach to develop lifelong learning skills in accounting for business combinations. *Journal of Education for Business*, 76 (2), 81-86.
- Durrani, K., & Bagherianfar, M. (2014). Heutagogy in adult education and education. National Conference of the Iranian Curriculum Studies Association (Changes in the curriculum of educational courses), No, 12. (In Persian)
- Gupta, B.G., & Gupta, B. L. (2022). Atmanirbhar (self-reliant) Bharat -Heutagogy in Higher Education. *International Journal of Social Science and Humanities*, 3 (4), 16-21.
- Hamdan, A., Wong, K., & Salleh, S. M. (2021). M-Heutagogy Acceptance among Students of Higher Education Institutions: *The Conceptual Framework International Journal of Academic Research in Business and Social Sciences*, 11(6). <https://www.researchfate.net/publication/353143519>.

- Handayani, S.M., Yeigh, T., Jacka, L., & Peddell, L. (2021). Developing a heutagogy approach to promoting teacher competencies in Indonesia. *Cypriot Journal of Educational Science*, 16(3), 939-951. <https://doi.org/10.18844/cjes.v16i3.5765>
- Hase, S. (2000). Capability and coping in the new millennium: a new challenge for education. paper presented to Universities, Colleges and Sustainable Health: a 21st Century Investment Conference. Preston. UK: 4-6 September.
- Hase, S. (2009). Heutagogy and e-learning in the workplace: Some challenges and opportunities. *Journal of Applied Research in Workplace E-learning*, 1(1) :43-52. doi: 10.5043/impact.13
- Hase, S., & Kenyon C. (2007). Heutagogy: A child of complexity theory. *International Journal of Complexity and Education*, 4(1): 111-119.
- Hase, S., & Kenyon, C. (2003). Heutagogy and developing capable people and capable workplaces: strategies for dealing with complexity. Proceedings of The Changing Face of Work and Learning conference, Alberta, Canada:25-27 September, University of Alberta, Alberta, Canada.
- Hase, S., & Kenyon, C. (2013). Self-determined: Heutagogy in Action. Bloomsbury. London.
- Havery, C., Townsend, L., Johnson, A., & Doab, A. (2019). Professional development for teachers of nursing students for whom English is an additional language: A reflection on Practices. *Nurse education in practice*, Doi: 10.1016/j.nepr.2019.05.012
- Hejazi, E., Salehnajafi, M., & Amani, J. (2015). The mediating role of intrinsic motivation on the relationship between basic psychological needs and life satisfaction. *Contemporary Psychology*, 9(2), 77-88. (In Persian)
- John, C. K. L., Wing, P. L., & Yuk, Y. L. (2003). Teachers Evaluation and Effectiveness in Hong Kong: Issues and Challenges. *Journal of Personnel in Education*, 17(1), 41-65.
- Karimi, F. (2013). Teacher's professional qualifications. Esfahan: Islamic Azad University. (In Persian)
- Lee, M. J. W., & McLoughlin, C. (2007). Teaching and learning in the Web 2.0 era: empowering students through learner generated content. *International Journal of Instructional Technology & Distance Learning*, 4(10), 21-34.
- Maleki, H. (2012). qualifications of teaching Profession. *Tehran: Madreseh pub.* (In Persian)
- Mehman Doost Ghamsari, Z. (2019). Designing and validating a model for Workplace Curriculum [Doctoral dissertation]. Shahid Beheshti University, Tehran, Iran. (In Persian)
- Mehrmohammadi, M. (2001). Exploring the nature of teaching and its relationship with learning. *Quarterly Journal of Education*, 17(4), 65:47-60. (In Persian)
- Nafeei, H. (2016). The mediating role of achievement motivation in the relationship between the perception of teachers' professional competence and students' self-directed learning [dissertation]. Tehran University, Tehran, Iran. (In Persian)
- Niknami M., & Karimi, F. (2009). A Study of the Professional Competencies of General Education Teachers and Presentation of an Appropriate Conceptual Framework. *Research in curriculum learning*, 6 (23), 1-22. (In Persian)
- Nikolovska, A. Ilieva., Grizev, A., & Iliev, A. (2019). History of Heutagogy as a self-determined learning. 2-nd International Scientific Conference MILCON'19, Skopje. <https://www.researchgate.net/publication/340413627>
- Phelan, A. M., & Vintimilla, C. D. (2020). Autonomy as Responsibility in Professional Life: Deconstructing Teaching Standards. *Curriculum Research*, 1(2): 13-24.
- Plate, R. (2010). Assessing individuals' understanding of nonlinear causal structures in complex systems. *System Dynamics Review*, 26 (1), 19-33.
- Raouf, A. (2007). Teacher training and internship. *Tehran: Ravan Pub* (In Persian)
- Reeve, J. M. (2015). Understanding motivation and emotion. Translate by: Yahya Sayed Mohammadi. *Tehran: Virayesh pub.* (In Persian)
- Roman, A.G. (2021). Challenges, Coping Strategies and Practices of Tertiary Faculty on Using Flexible Learning Modality in Teaching Mathematics During the COVID-19 Pandemic. *International Journal of Current Research*, 13 (1), 15642-15647. DOI: <https://doi.org/10.24941/ijcr.40449.01>.
- Salavati, A., Rostami Noroozabad, M., Kamangar, F., & Rahmani Noroozabad, S. (2014). Systems Thinking and Implementation of Knowledge Management. *Journal of Strategic Management Studies*, 5(18):73-99. (In Persian)
- Shafiee, N. (2013). Basics of adult education. Tehran: Islamic Azad University. (In Persian)
- Shafiee, N. (2018). Self-Determination Curriculum based on heutagogy Approach, *The 5th International Conference on Psychology, Educational and Lifestyle, Qazvin, Iran.* (In Persian)

- Shafiee, N., & Bakhshimanesh Gashti, S. (2019). Distance education curriculum on the basis of heutagogy. *3rd National on psychology, Education and Lifestyle, Qazvin, Iran.* (In Persian)
- Shafiee, N., Behroozi, N., ShehniYailagh, M. & Abolghasemi, M. (2019). Construction and Validation of the Questionnaire of Individual Systemic Thinking. *Journal of Management and Planning in Educational Systems.* 12(22), 257-284. (In Persian).
- Stephenson J., & Yorke, M. (1998). *Capability and quality in higher education.* London: published by Kogan Page.
- Tarafi, J., Nategi, F., & Jallalvandi, M. (2020). Study of the position of Pedagogy, andragogy and heutagogy educational Approaches in high school teacher's professional development. *Journal of School administration,* 8(1): 77-96. <https://doi.org/10.34785/J010.2020.524> (In Persian)
- Wong, K. T., Muhammad, M.B., Abdullah, N. b., & Hamdan, A. (2020). Mobile-Heutagogical Practices among Student Teachers: Its Pedagogical Affordances and Challenges. *International Journal of Interactive Mobile Technologies,* 14(2), 130-142. <https://doi.org/10.3991/ijim.v14i02.11819>
- Woods, P., Pharm, B., Gapp, R., & King, M. A. (2015). Researching pharmacist managerial capability: philosophical perspectives and paradigms of inquiry. *Research in Social and Administrative Pharmacy,* 11, 265–279.
- Wrahatnolo, T. (2018). 21st centuries skill implication on educational system. In IOP Conference Series: *Materials Science and Engineering,* 296(1), IOP Publishing. doi:10.1088/1757-899X/296/1/012036.
- Zandavanian Naeeni, A., Rahimi, M., & Pourtaheri, F. (2014). A study of the relationships between learning approaches with student's qualitative & quantitative academic performance. *Research in School and Virtual Learning,* 1(4): 29-41. (In Persian)