



A Comparative Analysis of Argumentation Skills at Intended and Experienced Levels of Iran's Higher Education Curriculum

Mustafa Esfandiari¹

Ebrahim Talae² (Corresponding author)

Syed Mahdi Sajjadi³

Javad Hatami⁴

ARTICLE INFO	ABSTRACT
<p>Received: 07 January 2023 Revised: 22 February 2023 Accepted: 04 August 2023 Online: 22 December 2023</p>	<p>One of the ultimate goals of pursuing higher education is to prepare the next employees with the necessary knowledge and skills. This includes cultivating university students' scientific skills, especially argumentation skill. From an educational point of view, argumentation skill is a learning mechanism, the use of which leads to knowledge development. Exploring the states of this skill in the intended and experienced curricula of Iran's higher education system is the aim of this study. The analysis of the intended curriculum was done by using the directed qualitative content analysis method. The sampling method was the purposeful sampling technique. The units of analysis include word, phrase, sentence, and paragraph. The expression method consisted of latent and manifest messages. Thereafter, for the experienced curriculum, using the snowball sampling technique, the argumentation ability of 130 university students was assessed. Findings: The first finding of the analysis of the intended curriculum showed that at the policy and management levels of Iran's higher education equipping students with academic skills such as argumentation has been recognized and defined as goals both latently and manifestly. The second finding showed that students written responses didn't have a proper argumentative structure. This finding is not consistent with the first finding. The inconsistency between the intended curriculum and the experienced curriculum indicates that at the level of implementation, this skill development has not been paid attention to. In addition, the experienced curriculum shows that students do not acquire argumentation skill from the hidden curriculum of the university environment</p>
<p>KEYWORDS</p> <p>Argumentation Experienced Curriculum Higher Education Intended Curriculum</p>	

¹ Ph.D. Student, Department of Education, Tarbiat Modares University, Tehran, Iran, Email: M.esfandiari@modares.ac.ir

² Associate Professor, Department of Education, Tarbiat Modares University, Tehran, Iran, Email: E.talae@modares.ac.ir

³ Professor, Department of Education, Tarbiat Modares University, Tehran, Iran, Email: Sajadism@modares.ac.ir

⁴ Professor, Department of Education, Tarbiat Modares University, Tehran, Iran, Email: J.hatami@modares.ac.ir

1. Introduction

University's evaluation in goals and functions has been conceptualized as different university generations. The common feature of these generations is their scientific framework. Acquiring scientific behaviours to perform university's scientific activities is necessary (Hosseini & Diani, 2014). Among different scientific behaviours, the transdisciplinary skill of scientific thinking is of great importance. Scientific thinking includes applying the principles of scientific research and reasoning in problem-solving situations (Zimmerman, 2007). Scientific reasoning and argumentation are often considered as being among the critical skills that students need in order to master the challenges in knowledge societies (Fischer, Kollar, Ufer, Sodian, Hussmann, Pekrun et al., 2014). University students are expected become proficient reasoners both to participate in the labour market in the future and to carry out their scientific activities in universities (Ding, Wei, & Mollohan, 2016; Wolfe, 2011). They need to argue rationally in and out of their field of study (Andrews, 2015), to do their academic activities such as writing essays, scholarly articles, dissertations, giving lectures, and so on (Andrews, 2009; Wolfe, 2011). Well-argued academic activities bring a sharper sense of meaning and significance to issues (Andrews, 2015).

Argumentation is a highly valued outcome of higher education (Fischer, Kollar, Ufer, Sodian, Hussmann, Pekrun et al., 2014). This skill is the subject of various fields of study that shed light on it to draw its knowledge (Eemeren, Grootendorst, & Henkemans, 2002). Due to its unique nature, a comprehensive theory has not yet been proposed. The Aristotle distinguished between didactic, rhetoric and dialectic functions of argumentation based on his assumption that all knowledge, opinions and insights that arise in rational thought are based on existing knowledge, opinions and insights (Andrissen, 2006; Van Eemeren et al., 2019, Van Eemeren et al., 1987, 1996, as cited in Noroozi, Weinberger, Biemans, Mulder, & Chizari, 2012). The didactic aspect is concerned with teaching apodictic truths, which rarely tested in formal educational settings (Van Eemeren et al., 2019). Its rhetorical form is a type of dialogue between an arguer and real or imaginary audience(s). The arguer tries to persuade or convince the addressee of the acceptability of the standpoint at issue rationally (Jonassen & Kim, 2010; van Emeren et al., 2014). It may occur within individuals or in groups (Driver, 2000). This type of argumentation is also called monological form, which was well-formed in Toulmin's (2003) model. This model has six components. Claim, evidence, warrant, backing, qualifier, and exception are its components. The dialectical form of argumentation refers to a situation where the audience(s) has the possibility to express opposing views in a critical discussion (Jonassen & Kim, 2010). The expressed point of views may be

accepted, rejected or modified (Lietao, 2003). Various models of dialectical argumentation have been proposed.

In the educational planning of Iran's higher education system, it is emphasized to empower students to carry out research activities after completing different courses (Azma, 2018). This is more prominent in postgraduate courses (Salehi, Kareshki & Ahanchian, 2012). The basis of this emphasis goes back to the discipline-oriented nature of the curricula. Scientific disciplines are theories related to the organization of knowledge in which the search for dissemination and development of knowledge occurs in different fields. There are systems in which knowledge and ways of knowing are defined, collected, stored, enclosed and disseminated. According to scholar academic ideology, entering a field of study requires learning mental skills that are used in that field (Schiro, 2013). Andrews (2015) believes that people who work in scientific fields are involved in reasoning process. According to Ding et al., (2016) the extended form of argumentation is considered equivalent to scientific thinking (Fischer et al., 2014). Wolfe's (2011) findings showed that argumentation skill is deeply embedded in academic disciplines. His exploration of university students' assignments from different fields of study including social science, education, natural science, business and fine arts showed that argumentation is required in different university curricula.

Although Iran's higher education curricula are based on scientific disciplines, they do not provide the basis for the development of scientific skills (Arefi, 2006). Such a thing, that is spreading knowledge without knowing how to achieve it, although possible, is not complete (Alexander et al., 1991). Students, in addition to acquiring the facts and concepts of their field of study, should also learn scientific skills. By learning these skills, they are prepared to do their scientific assignments (McNeil, 2010; Hosseini & Dayani, 2014; Noroozi et al., 2010). The critiques of the benefits of formal logic and growing demand for critical thinking in education provided the ground for considering the argumentation (Walton, 2014). By learning argumentation skill, students could learn from new information and experiences (Ding et al., 2014). So, their knowledge will advance (Kuhn, 1993).

Lack of argumentation skill leads to student's weakness and inability to carry out their scientific activities and development of scientific knowledge. According to Audi (2010) knowledge is the justified true belief in the right context from the right way. A justified proposition that is called knowledge requires the act of justification, and justification is done by applying reasoning. This process is determined by logic activists. Walton (1990) explains that argumentation is driven by reasoning. From psychological point of view, reasoning is a mental capacity that allows moving

from a belief or a set of evidence to a new belief (Evans & Over, 1996). From an educational point of view, argumentation is a learning mechanism (Noroozi et al., 2012). This higher mental activity (Zohar & Dori, 2003; Anderson, 2008) has a positive long-term effects on knowledge construction (Nussbaum, 2008).

Researchers in the field of education have shown interest in the argumentation skill, because the use of this skill provide the development and expansion of scientific knowledge (Asterhan & Schwarz, 2007; Bathgate, Crowell, Schunn, Cannady & Dorph, 2015); Consolidation of previous knowledge, explanation and expansion of learners' understanding of the subject at the highest level of abstraction (Von Aufschnaiter, Erduran, Osborne, & Simon, 2008); Improving critical thinking skills (Binkley, 2010); sustainability and strengthening other mechanisms such as problem-solving skills (Ko & Jonassen, 2002), conceptual learning (Asterhan & Schwarz, 2007; Foutz, 2018), conceptual change (Asterhan & Schwarz, 2009; Chen and Joshua, 2012), improving reasoning skill (Reznitskaya, Anderson, & Kuo, 2007), enhancing individual and collaborative construction of knowledge and its evaluation (Schwarz & Glassner, 2007), selection of one point of view among others and its defense by presenting reason as the last stage of cognitive development in youth (Perry, Donovan, Kelsey, Paterson, Statkiewicz, & Allen, 1986). Despite the benefits of argumentation skill, Andrews (2015) listed two reasons of ignoring its teaching. One is that activists in a discipline do not consider themselves responsible for teaching it; another reason is that, they believe teaching this skill is not necessary. This is while, argumentation experts and activists believe that this skill needs to be learned to be used (Cerbin, 1988). Scholars showed that its learning could be done through curriculum (Kuhn, 2009). Considering the argumentation skill intentionally as an element of intended curriculum (learning mechanism), firstly needs providing a clear image of its status as a cornerstone of future studies to make knowledge base for developing a curriculum based on this skill (Dawson & Venville 2009). We need to know the states of this skill in Iran's higher education system. In the present study, by examining the upstream documents that are prepared by government institutions and have the role of guiding and shaping the goals of the intended curriculum and also studies conducted in the country in relation to the training of argumentation and other related scientific skills. So, we examined both intended and experienced curriculum of Iran's higher education system. Marsh (2009) defined curriculum as an intended plan and experiences students accomplish under the school's guidance. The word plan in this definition refers to the prescriptive part of the curriculum: "what ought to happen." And the word experience relates to students' experiences which is more than mere implementation of the intended curriculum (Ellis, 2004).

A planned curriculum is an intended process help to manage the expectations of the school stakeholders, enable better decision-making on basic considerations of curriculum, and provide consistency between its different elements. This is where educational goals, objectives, and activities are determined (Marsh, 2009). Teachers are the leading implementers of the intended curriculum. The experienced curriculum refers to students' experiences and learning outcomes (Akker, Kuiper, & Hameyer, 2003). The aim of this study is to do a comparative analysis of the status of argumentation skill in the intended and experienced curricula in Iranian higher education and research questions are as below:

- What are the characteristics of the intended curriculum at the level of higher education in terms of attention to argumentation skill?
- What are the characteristics of the experienced curriculum at the level of higher education in terms of attention to argumentation skill?

2. Literature Review

The ability to infer is the common denominator of argumentation and critical thinking skill. Various studies explored the states of critical thinking skill in the Iranian higher education but there is no any study to examine the status of argumentation. Ramazani, Safai-Moghadam and Parsa (2009) in a case study investigated the impact of higher education curricula on students' critical thinking skills. Their findings showed that students did not get the acceptable score in analysis, evaluation and inference. They emphasized the need to review the educational goals, methods and curricula at the higher education to achieve scientific skills. Hashemi, Chenari and Tahmasabi (2013) also found that the attempt at the higher education to develop critical thinking skills was an unsuccessful and unbalanced. They saw that university students' inference and evaluation skills were lower than the desired average standard and do not have a balanced distribution among different faculties of Mazandaran University. In line with these findings, the summary of Mohammadi and Jahanian (2016) from the study of the role of critical thinking in higher education, indicated that the university does not pay attention to development and dissemination of evaluation and construction skills in addition to the transfer of knowledge. Other studies that investigated critical thinking skills of the students from different universities across the country, reached similar results (Abdul Wahabi, Rumiani, & Zarif, 2012; Rezaei & Pour-Abutaleb, 2014; Darban, Ashtari, Mortazavi, Furqani, & Yazdani, 2015; Azami, & Salehi-Nia, 2014; Hariri, & Bagherinejad, 2018; Hashemi et al., 2013; Rezaei, & Pour-Abutaleb, 2014; Amini, Madani, & Asgarzadeh, 2014; Chengiz, Adibi, Hosseini, & Totunchi, 2012). The overall result of these national

studies is that the Iranian university students' critical thinking skills does not reach the acceptable level.

There are international studies that explored the states of argumentation. Javed, Nawaz and Qurat (2015) assessed the critical thinking ability of postgraduate students in Pakistan. He realized that student perform poorly in this field. Neri, Robledo, Noguez, García and González (2019) found that freshmen engineering physics students' argumentation structure were not based on desired structure. Aydeniz and Gürçay (2013) assessed the quality of written scientific arguments developed by pre-service physics teachers from two public universities in Turkey. Data analysis showed that the majority of students failed to develop strong scientific arguments. Latif (2004) examined the states of moral argument of US pharmacy students. He realized unbalanced growth of that skill among them.

3. Research Method

To answer the questions, the intended and experienced curricula were assessed respectively. Iran's higher education aims and visions are determined by governmental agencies. They are published in five documents including: 1. the 20-year vision's document of the Islamic Republic of Iran (Iran's constitutional council, 2007); 2. The Law of the Fifth Five-Year Development Plan of the Islamic Republic of Iran (The parliament of Islamic council of Iran, 2011); 3. The comprehensive scientific map of the country (Tehran University, n.d.); 4. Government's general policies of technology development in the development of higher education and affiliate institutions (Expediency Discernment Council, 2005); 5. Law of Ministry of Science, research and technology (The parliament of Islamic council of Iran 2005). The parliament of Islamic council of Iran, These documents determine the universities' goals and objectives of the intended curricula respectively. Using the purposeful sampling method, all of these documents were chosen and evaluated in this study. The units of analysis were word, phrase, and sentence.

Besides, to understand the status of argumentation skill in the experienced curriculum, 130 junior university students (60 male and 70 female) were selected by using snowball-sampling method. They were contacted via WhatsApp and Email. The participants in the study are from different universities of the country including: University of Kurdistan, Imam Khomeini International University of Qazvin, Al-Zahra University, Shahid Beheshti University, University of Tehran, Farhangian University, Torbat Heydarieh University, Khwarazmi University, Isfahan University, Ferdowsi University of Mashhad, Bu-Ali Sina University Hamadan, Tabriz Azad University, Tehran Payam Noor University, Sanandaj Payam Noor University, Ahvaz University of

Science and Research, Urmia University, Zanjan University, Qazvin University, Gilan University, Shahrood University of Technology, Lorestan University, Hormozgan University, Shahid University, Azad Sanandaj, and Semnan University. Their ages range from 20 to 33 years. All of them were participated in a written argumentative assignment. In the assignment, the students were asked to take a standpoint and provide evidences regarding two opposing views on the relationship between Iranian teachers' income and their responsibilities. Students were asked to argue for and against two different views regarding teacher's income and their duties in Iran. They did not know that the main purpose of the study was to examine the argumentative structure of their written responses. After collecting the writings, they were examined in terms of having an argumentative structure.

The units of analysis include word, phrase, sentence, and paragraph. Data collection lasted a month. One hundred and thirty graduate and postgraduate students with at least two years of study in the field of education participated in this study. The participants were multidisciplinary professionals; most of them were teachers 70 (53.8%), 40 (30.8%) of them were not employees, but only graduate and postgraduate students in the field of education, and 20 (15.4%) were university employees. There were more women, 70 (53.8%) than men, 60 (46.2%).. Their academic years of study in the field of education spanned from 2 years to 4 years. The participants' educational level was diverse in which 80 (61.54%) were Ph.D. students, and 50 (38.46%) were bachelor and master university students. All students who participated in the study were studied at public universities.

To examine the status of argumentation skill in Iran's higher education two types of curriculum were analysed. The intended curriculum at the higher education level of Iran, which we intend to examine in this study, has been published in the form of five upstream documents, which including: 1. the 20-year vision's document of the Islamic Republic of Iran (Iran's constitutional council, 2007); 2. The Law of the Fifth Five-Year Development Plan of the Islamic Republic of Iran (The parliament of Islamic council of Iran, 2011); 3. The comprehensive scientific map of the country (Tehran University, n.d.); 4. Government's general policies of technology development in the development of higher education and affiliate institution (Expediency Discernment Council, 2005); and, 5. Law of Ministry of Science, research and technology (The parliament of Islamic council of Iran 2005).

To investigate the experienced part of the curriculum, according to the definition of Marsh (2009), the participants in the study were asked to argue on a social science issue. They were asked to choose one of the views for and against the increase in salaries of Iranian teachers according to

the hours they are engaged in educational activities throughout the year, in the school. Participants entered their answers in a form created in Google Doc. Participants written responses.

The assignment, which was designed to assess the argumentation competency of participants had an educational background. Firstly, a topic, namely "Teachers' payment," was chosen as the subject of the assignment. Familiarity and understanding of the content of the assignment are the indicators of the quality of students' arguments (Von Aufschnaiter et al., 2008). So that, the background content of the assignment was selected from the scholarly literature on the duties and activities of teachers, which they have to do for students. They are called after and before teaching activities. Knowing these concepts is a part of the content knowledge of students who studied in the field of education. After that, the background content knowledge was presented and then followed by a question. Students were asked to propose their standpoints and justify them. The main assessment point of the assignment is shown in table 1.

Table 1. Basic information and key evaluation points of the participants' assignment

Name	Topic	Characteristic	Key assessments points
Teachers' payment	Socio scientific issue in teaching	There are two different claims and facts about the duties of teachers inside and outside the schools.	<ol style="list-style-type: none"> 1. Construct one claim 2. Providing the evidence(s) in support of the proposed claim; 3. Stating the warrant to connect the evidence(s) and claim correctly. 4. Stating the backing to provide information on the relationship between the claim, data, and warrant. 5. Considering the qualifier to determine the degree of certainty. 6. Stating the exception(s) to the claim

Based on the form of expression, argumentation is classified into two forms: written and oral. In its written form, written language is used to represent the process and all its components. Various academic reports, such as journal articles, essays, dissertations, etc., written by academics are argumentative in nature. Writing such reports requires content knowledge of the scientific field, the ability to argue and the ability to write (Deng & Wang 2017). Since we have textual data in both parts of the study, the qualitative content analysis method was used to provide descriptive knowledge and understandings of the status of the phenomenon under study (Assarroudi, Heshmati Nabavi, Armat, Ebadi, & Vaismoradi, 2018). It focuses on reducing the data into manageable sections. Conventional (inductive), directed (deductive), and summative approaches of

qualitative content analysis have been identified based on their applications. These approaches are applied to interpret meaning from the content of textual data (Hastie & Peter, 2012).

The concepts and codes to examine the textual data of both parts of the curriculum extracted from the theoretical framework and previous researches. In such a situation, when a theory or other research findings guide the initial codes, the directed content analysis approach is applied (Hastie & Peter, 2012). However, the researchers paid close attention to the new concepts and codes arising from documents and how students argued in the assignment. To gain a deep understanding of the data, both manifest and latent contents were considered in the analysis process. In the manifest content, respondents' actual words form the codes or concepts, and in the latent content, concepts are derived from the interpretation and judgment of participants' responses.

Qualitative data analysis is an iterative and simultaneous process (Creswell, 2012). Based on the synthesized process of directed content analysis provided by Assarroudi et al., (2018), data collection and analysis in this study were done simultaneously. The data were coded by one of the authors and were shared with another author while coding. In cases of disagreement, the original manuscripts were referred to for clarification. The main steps of the directed content analysis included:

- (1) Immersion into data: to gain a sense of the whole, all documents of the intended curriculum and each manuscript of the participants were read several times considering such questions: Is this document paying attention to teaching argumentation? Did a participant argue correctly? Does the manuscript contain the components of the Scientific Argumentation Pattern (TAP's model)? Is the author's claim clear? Is the claim related to the proposed issue? Has he/ she been able to provide evidence(s) to support his/ her claim?
- (2) Argumentation, reasoning, scientific thinking, and rationality were used as main categories in the first part of the study. The six components of Toulmin's argumentation pattern (TAP) were selected as the primary coding.
- (3) Developing formative categorization matrixes, main categories, and related subcategories for both parts of the study constructed based on the theoretical literature of the study.
- (4) Providing an anchor example for each main category.
- (5) The matrix was tested in a small portion of the participants to increase the inter-coder reliability and trustworthiness of the study.
- (6) Eliciting words, phrases, statements, and paragraphs that support a particular code in the documents and manuscripts.

- (7) Reflecting on the extracted concepts from the documents and synthesizing the main ideas of the participants' manuscripts.
- (8) The following coding rules were developed based on the theoretical literature for more clarification of the main categories of the intended curricula and Student's knowledge of the structure of argumentation, which is written respectively: Argumentation is the ability of educated individuals to justify their standpoints structurally (latent). Reasoning is the authentic way of thinking logically. Rationality is the ability to reason. And scientific thinking is an ability and a perspective. In the argumentative structure of students' written responses, a claim is an attitude or belief that one holds on an issue. Data are evidence(s) related to the proposed claim. A warrant is a hypothetical general statement, which indicates the relationship between the claim and data. The backing provides extra precise information about the relationship between the claim, data, warrant, and condition of rebuttal. The qualifier in students' responses determines the degree of certainty, which is written before the conclusion. And rebuttal were inconsistent matters with Student' beliefs expressed in their written responses. They are an exception(s) of their proposed claims.
- (9) Performing main data analysis. Meaning units related to the study's aims and categorization matrix were selected from the reviewed content
- (10) Inductive abstraction of emergent meaning units related to the study's aims and categorization matrix.
- (11) In the second step of the analysis, TAP's components were used to analyse written responses. Nine subcategories were identified. They are shown in figure 1. These subcategories are different combinations of the elements of the TAP model.

Table 3. Example of the analysis process of intended curriculum: The comprehensive scientific map of the country (Tehran University, n.d.)

Meaning Units	Codes	Main Categories	Theme
Participating in scientific thinking and debate	Scientific debate and Scientific thinking	Argumentation	Argumentation skill
Strengthen the power of thinking and reasoning	Thinking and reasoning	Reasoning	
Strengthen logical thinking	Logical thinking	Rationality	

Table 4. An example of the analysis process of students' argumentative written responses

Meaning Units	Subcategories	Main category
Salary must include school hours and beyond. The teacher's activities are probably beyond school hours.	Claim	Written Argumentation skill
According to experts, teacher's activities end in three categories: before class, during class, and after class. Teachers' official working hours only include their work at school and do not include extracurricular activities before and after teaching.	Data	
Like other governmental agencies, if we equate teachers' working hours with their salaries, their salaries should include pre and post-teaching activities.	Warrant	
In other agencies to activities outside of working hours in the office, salary awarded.	Backing	
Probably	Qualifier	
Of course, employees of other agencies likely do unpaid activities at home once or twice a month.	Rebuttal	

4. Findings

The analysis of the intended curriculum documents generally revealed three main categories: argumentation, reasoning, and rationality as educational goals of Iranian higher education. These documents provided general prescriptive statements on the cultivation of reasoning, argumentation, and rationality but without any practical guidance. These recommendations were unbalanced such that in document 3, the scientific map of the country, cultivation of argumentation, reasoning, and rationality as goals of higher education have manifestly been stated. In the first document, it is twice implicitly recommended to cultivate reasoning, while there is no attention to these skills in the second one (The Law of the Fifth Five-Year Development Plan of the Islamic Republic of Iran), either manifestly or latently; the fourth and fifth documents (Government's general policies of technology development in the development of higher education & affiliate institution and Law of Ministry of Science, research and technology), implicitly pay attention to the growth and development of students' scientific abilities. Based on existing theories and previous researches, two main categories, including argumentation, reasoning, and scientific thinking, were derived deductively from the theoretical literature. Moreover, rationality was an emergent category derived inductively from reviewed content.

In the second part of the study, students' written responses were analysed based on the TAP model. During the data analysis process, different combinations of the elements of the model were extracted, apart from the complete structure of this model (Six interrelated components including

claim, data, warrant, backing, qualifier and rebuttal (CDWBQR). As a result of the analysis, nine different themes were identified, reported with direct quotations from the students' manuscripts below.

Deductively, the elements of the TAP model were considered one theme (CDWBQR). It turned out that only one answer has the six components of the written argumentative structure. One of the participants stated: "I think the teacher's activities are beyond school hours. According to experts, teacher's activities end in three categories: before class, during class, and after class. In our country, teachers' official working hours only include their work at school and do not encompass extracurricular activities before and after teaching. Like other governmental agencies, if we equate teachers' working hours with their salaries, their salaries should include pre and post-teaching activities. In other agencies to activities outside of working hours in the office, salary awarded. However, in a few cases, probably employees of other agencies do unpaid activities at home".

Although participants were asked to give reasons for their claim in the assignment, in 20 responses, what was written contained only the claim. A Ph.D. male student wrote, "In my opinion, teachers have a lot of activities and conflicts in the workplace". In his rest of the text he had nothing to do with the claim. A master female student wrote: "I think an hour of educational work is more demanding than a few hours in other governmental agencies". Another male student reported that: "There is an imbalance between living expenses and teachers' income".

Many participant's written responses (N=71) contained only facts. They only provided data without related claims, warrants, and other components. A Ph.D. student wrote: "Teachers' working hours goes beyond school hours and their salaries equal to their working hours at the school". A master student wrote: "attending the class requires preparation and study; Question design is done at home; Assessment of test sheets is done at home. A master student wrote what teachers do at home is not part of overtime hours".

There was an answer in which it contained the warrant only (N=1), "I disagree; teaching is time-consuming and has high job burnout".

The existence of two components, including claim and data, was another form of the structure of student's written responses (N=9). These students were able to provide data aligned with their proposed claims. A Ph.D. student wrote that: "teacher's activities are more than class attendance. They provide a daily plan for each lesson before entering the classroom". A master student wrote: "In my opinion, teaching is a complex and challenging task. You have to deal with a

large number of students at the same time. Each of them has its own needs. Their level of understanding varies in different subjects”.

Data and warrant (N=3) as a structure of students' written responses. A female student wrote: “I can't entirely agree with the hour-based payment. Employees who are paid based on attendance do not feel highly secure”. Another female student wrote: "I think hour-based payment is not wrong; it lowers the value and prestige of teachers. Teachers nurture future generations; they must have a high level of welfare”.

Claim and warrant (N=1) were the components of the structure of a written response. A female student wrote: “I disagree with the hour-based payment. Given the individual differences of students, managing a classroom is not an easy task. It is much wider than it is in school; this job also faces many challenges”.

Claim, data, and warrant (N=14). A male student wrote: "The hours that teachers, especially in elementary school, work with students do not only include 28 hours per week but also beyond. While teaching, the teacher cannot do curriculum planning, evaluation of test sheets, and some administrative responsibilities. Students' level of understanding varies, and the teacher's task is to identify possible misunderstandings and correct them. Jobs with a lot of tasks and conflicts must receive higher salaries and benefits". In addition to these cases, there were responses in which none of the components were present. These answers are referred to as component-free in Figure 1.

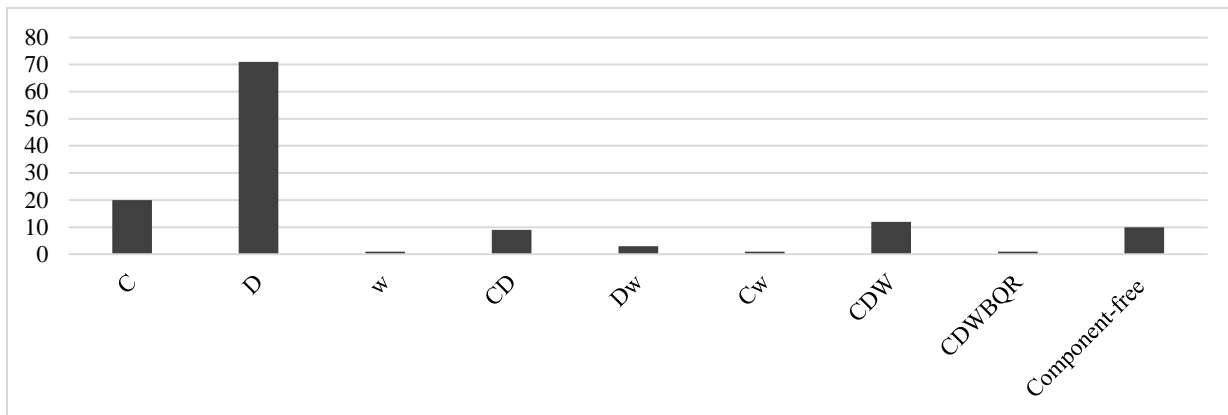


Figure 1. Graph of the extracted patterns of the student’s written responses based on the TAP model.

5. Conclusion

The aim of the present study was to determine the current state of the argumentation skill in Iran's higher education curricula. To do this, two types of curriculum, including intended and experienced, were explored. The main premise of the researchers of the study is that the ability to argue is an essential skill in academic contexts (Wolfe 2011; Rapanta, Garcia-Mila, & Gilabert 2013). Mastering this skill is a major component of academic success at both undergraduate and graduate levels of higher education (Newell, Beach, Smith, & Heide, 2011; Mirza, & Perret-Clermont 2009). Educational experts who are studying educational applications of argumentation skill believe that this skill could be learned through curriculum (Kuhn, 2009; Gallagher, 2011). But, put it intentionally as a learning mechanism of curriculum, firstly needs providing a clear image of its state as a cornerstone for future studies to make knowledge base for developing a curriculum based on that (Dawson and Venville 2009).

To analyse the intended curriculum the upstream documents of Iran's higher education regarding the description of the current state of the argumentation skill were analysed. These documents shape and guide the intended curriculum of universities. The first finding of the analysis showed that at the policy and management levels of Iran's higher education equipping students with academic skills such as argumentation has been recognized and defined as goals both latently and manifestly.

To understand the experienced curriculum the argumentative writing of 130 university students were analysed. This study showed that students written responses didn't have a proper argumentative structure. There is an anomaly between intended and experienced curricula of Iranian universities. It can be concluded that despite the emphasis on learning argumentation and reasoning skills in upstream documents of Iran's higher education as a goal, universities did not pay enough attention to argumentation skills. This finding supports studies conducted by Mohammadi & Jahanian (2016) and Ramazani, Safai-Moghadam & Parsa (2009).

Scholars cited two reasons for the lack of attention and teaching of argumentation skill at the university. The first reason is that activists in a discipline do not consider themselves responsible for teaching argumentation skill; and, the second reason is that, they believe teaching this skill is not necessary. These reasons can be examined in Iran's higher education system. In addition to these, we concluded that in the implementation and hidden curricula of Iran's higher education system, learning academic skills such as argumentation has not been considered. This conclusion is consistent with the results of other researchers who studied scientific skills in Iran. Researches done by Ramazani, Safai-Moghadam and Parsa (2009) emphasized the need to review

the educational goals, methods and curricula at the higher education to achieve scientific skills; Hashemi, Chenari and Tahmasabi (2013) saw that university students' inference and evaluation skills were lower than the desired average standard and do not have a balanced distribution among different faculties of Mazandaran University; Mohammadi and Jahanian (2016) studied the role of critical thinking in higher education. They found that the university does not pay attention to development and dissemination of evaluation and construction skills in addition to the transfer of knowledge. At the international level, Neri, Robledo, Noguez, García and González (2019), Aydeniz and Gürçay (2013), Latif (2004) have investigated the states of argumentation skill in their educational systems. They realized that the subject of argumentation has been neglected in their higher education system and there is no program to teach it.

The inconsistency between the intended curriculum and the experienced curriculum indicates that at the implemented curriculum, no attention is paid to the development of argumentation skill. In addition, the experienced curriculum shows that students do not acquire argumentation skill from the hidden curriculum of the university environment. Considering the findings of the current study, it is suggested that the following issues should be considered by Iranian's higher education curriculum planners:

- Educational planners and curriculum implementers at the higher education level are advised to pay more attention to the development of scientific skills, including argumentation skill.
- A detailed examination of the implemented and hidden curricula are the limitations of the current research. Examining these programs can clarify new dimensions of obstacles and factors involved in the problem of argumentation.
- For the educational planners of the university, holding workshops and placing extracurricular programs for university professors and students focusing on the importance of argumentation and its teaching is a goal.

References

- Abdul Wahabi, M; Rumiani, Y ; Zarif, S . (2012). Examining the basic skills of students in the age of globalization. *Research and Planning Quarterly in Higher Education*, 70, 51-74. [In Persian]
- Amini, M., Madani, S., A; Asgarzadeh, Z. (2014). Evaluation and analysis of critical thinking skills of engineering students. *Iranian Engineering Education*, 16(63), 39-59. [In Persian]
- Anderson, R.E. (2008). Implications of the information and knowledge society for education. In *International handbook of information technology in primary and secondary education* (5-22). Springer, Boston, MA.

- Andrews, R. (2015). Critical thinking and/or argumentation in higher education. In *The Palgrave handbook of critical thinking in higher education* (49-62). Palgrave Macmillan, New York.
- Arefi, M. (2006). Evaluation of the educational science curriculum (educational management trend) in Iran's higher education from the students' point of view. *Curriculum Studies Journal*, No. 1, 43-74. [In Persian]
- Assarroudi, A., Heshmati Nabavi, F., Armat, M.R., Ebadi, A. and Vaismoradi, M. (2018). Directed qualitative content analysis: the description and elaboration of its underpinning methods and data analysis process. *Journal of Research in Nursing*, 23(1), 42-55.
- Asterhan, C.S. and Schwarz, B.B. (2007). The effects of monological and dialogical argumentation on concept learning in evolutionary theory. *Journal of Educational Psychology*, 99(3), 626.
- Asterhan, C.S. and Schwarz, B.B. (2009). Argumentation and explanation in conceptual change: Indications from protocol analyses of peer-to-peer dialog. *Cognitive Science*, 33(3), 374-400.
- Audi, R. (2010). *Epistemology: A contemporary introduction to the theory of knowledge*. Routledge.
- Azami, Z; Salehinia, H. (2013). Examining the critical thinking skills of students of the Faculty of Medical Information and Management of Tehran University of Medical Sciences in 1992. *Journal of the Center for Studies and Development of Medical Education*, 12(1), 49-55. [In Persian]
- Azma, F. (2018). Individual differences in research self-efficacy of physical education and sport sciences master's students. *Sport Management Studies*, 9 (44), 175-194. [In Persian]
- Aydeniz, M. and Gürçay, D. (2013). Assessing quality of pre-service physics teachers' written arguments. *Research in Science & Technological Education*, 31(3), 269-287.
- Bathgate, M., Crowell, A., Schunn, C., Cannady, M. and Dorph, R. (2015). The learning benefits of being willing and able to engage in scientific argumentation. *International Journal of Science Education*, 37(10), 1590-1612.
- Binkley, R. (1995). Argumentation, education and reasoning. *Informal Logic*, 17(2), 127-143
- Cerbin, B. (1988). The Nature and Development of Informal Reasoning Skills in College Students. ERIC, available at: <https://files.eric.ed.gov/fulltext/ED298805.pdf>
- Chengiz, T; Adibi, P; Hosseini, M; Totunchi, M. (2013). Viewpoints of Supervisors about the Problems in the Process of Dissertations for General Medicine Program Isfahan University of Medical Sciences. *Iranian Journal of Medical Education*, 3(1), 23-33, [in Persian]
- Darban, L; Ashtari, S; Mortazavi, F; Furqani, Z; Yazdani, Sh. (2015). Investigating critical thinking skills in medical students of Shahid Beheshti University of Medical Sciences and Tehran University of Medical Sciences. *Journal of Medical Sciences of Islamic Azad University*, 26(4), 229-237. [In Persian]

- Dawson, V. and Venville, G.J. (2009). High-school Students' Informal Reasoning and Argumentation about Biotechnology: An indicator of scientific literacy? *International Journal of Science Education*, 31(11), 1421-1445.
- Deng, Y. and Wang, H. (2017). Research on evaluation of Chinese students' competence in written scientific argumentation in the context of chemistry. *Chemistry Education Research and Practice*, 18(1), 127-150.
- Ding, L., Wei, X. and Mollohan, K. (2016). Does higher education improve student scientific reasoning skills? *International Journal of Science and Mathematics Education*, 14(4), 619-634.
- Driver, R., Newton, P. and Osborne, J. (2000). Establishing the norms of scientific argumentation in classrooms. *Science Education*, 84(3), 287-312.
- Ellis, A.K. (2014). *Exemplars of curriculum theory*. London: Routledge.
- Fischer, F., Kollar, I., Ufer, S., Sodian, B., Hussmann, H., Pekrun, R., Neuhaus, B., Dorner, B., Pankofer, S., Fischer, M. and Strijbos, J.W. (2014). Scientific reasoning and argumentation: advancing an interdisciplinary research agenda in education. *Frontline Learning Research*, 2(3), 28-45.
- Gallagher, C.T. (2011). Assessment of levels of moral reasoning in pharmacy students at different stages of the undergraduate curriculum. *International Journal of Pharmacy Practice*, 19(5), 374-380.
- Hariri, N; Bagherinejad, Z. (2018). Examining the critical thinking of students of the Faculty of Health, Mazandaran University of Medical Sciences and Health Services. *Journal of Mazandaran University of Medical Sciences*, 21, 166-173. [In Persian]
- Hashemi, S, M; Chenari, R; Tahmasabi, R. (2013). Evaluation of skills necessary to solve a complex problem in students of Bushehr University of Medical Sciences in 2012. *Scientific Research Journal of Ilam University of Medical Sciences*, 22 (7), 107-114, [In Persian]
- Hastie, P. and Hay, P. (2012). Qualitative approaches: Peter Hastie and Peter Hay. In *Research methods in physical education and youth sport* (84-99). Routledge.
- Hosseini, M; Dayani, M. H. (1393). Scientific behavior, comparative-analytical research around indicators and examples. *Library and Information Research*, 4 (1). 109-134. [In Persian]
- Iran's Expediency Discernment Council. (2005). *Government's general policies of technology development in the development of higher education and affiliate institutions*. <https://cfss.ir/1163/23>. Accessed September 27, 2022, [In Persian]
- Javed, M., Nawaz, M.A. and Qurat-Ul-Ain, A. (2015). Assessing Postgraduate Students' Critical Thinking Ability. *Journal on Educational Psychology*, 9(2), 19-26.
- Jonassen, D.H. and Kim, B. (2010). Arguing to learn and learning to argue: Design justifications and guidelines. *Educational Technology Research & Development*, 58(4), 439-457.

- Kuhn, D. (1993). Science as argument: Implications for teaching and learning scientific thinking. *Science Education*, 77(3), 319-337.
- Kuhn, D. (2009). Do students need to be taught how to reason? *Educational Research Review*, 4(1), 1-6.
- Latif, D.A. (2004). An Assessment of the Ethical Reasoning of United States Pharmacy Students: A National Study. *American Journal of Pharmaceutical Education*, 68(2), 1-10
- Marsh, C.J. (2009). *Key Concepts for Understanding Curriculum Teachers*. Routledge.
- Mirza, N.M. and Perret-Clermont, A.N. eds. (2009). *Argumentation and education: Theoretical foundations and practices*. Springer Science & Business Media.
- Mohammadi, L; Jahanian, R. (2016). The role of thinking in higher education. *Quarterly Journal of Strategic Studies of Humanities and Islamic Sciences*, 2(10), 109-117. [In Persian]
- Mouraz, A., Leite, C., Trindade, R., Ferreira, J. M. M., Faustino, A. M., & Villate, J. (2014). Argumentative skills in higher education: A comparative approach. *Journal of Education & Human Development*, 3(1), 279-299.
- Neri, L., Robledo-Rella, V., Noguez, J., García-Castelán, R.M. and González-Nucamendi, A. (2020). Developing Reasoning Competencies in a Short Introductory Engineering Physics Course. In *2020 IEEE Frontiers in Education Conference (FIE)* (1-8). IEEE.
- Newell, G.E., Beach, R., Smith, J. and Van Der Heide, J. (2011). Teaching and learning argumentative reading and writing: A review of research. *Reading Research Quarterly*, 46(3), 273-304.
- Noroozi, O., Weinberger, A., Biemans, H. J., Mulder, M., & Chizari, M. (2012). Argumentation-based computer supported collaborative learning (ABCSCCL): A synthesis of 15 years of research. *Educational Research Review*, 7(2), 79-106.
- Nussbaum, E.M. (2008). Collaborative discourse, argumentation, and learning: Preface and literature review. *Contemporary Educational Psychology*, 33(3), 345-359.
- Perry, B., Donovan, M.P., Kelsey, L.J., Paterson, J., Statkiewicz, W. and Allen, R.D. (1986). Two schemes of intellectual development: A comparison of development as defined by William Perry and Jean Piaget. *Journal of Research in Science Teaching*, 23(1), 73-83.
- Ramazani, A; Safai-Moghadam, M; Parsa, A. (2008). Have higher education curricula been able to develop students' critical thinking skills? A case study of undergraduate courses in Shahid Chamran University of Ahvaz. *Educational Sciences*, 91-92. [In Persian]
- Rapanta, C., Garcia-Mila, M. and Gilabert, S. (2013). What is meant by argumentative competence? An integrative review of methods of analysis and assessment in education. *Review of Educational Research*, 83(4), 483-520.
- Rezaei, M; Pour-Abutaleb, H. (2014). *Investigating the research skills of graduate students of Sari University of Agricultural Sciences and Natural Resources*. 1, 1-15. [In Persian]

- Reznitskaya, A., Anderson, R.C. and Kuo, L.J. (2007). Teaching and learning argumentation. *The Elementary School Journal*, 107(5), 449-472.
- Salehi, M., Karshki, H. & Ahanchi, M.R. (2012). Causal model test of the role of social cognitive factors affecting doctoral students' research self-efficacy. *Journal of Iranian Higher Education*, 5 (3), 59-83. [In Persian]
- Schiro, M. (2012). *Curriculum theory: Conflicting visions and enduring concerns*. London :Sage.
- Schwarz, B.B. and Glassner, A. (2007). The role of floor control and of ontology in argumentative activities with discussion-based tools. *International Journal of Computer-Supported Collaborative Learning*, 2(4), 449-478.
- Tehran University. (n.d.). *The comprehensive scientific map of the country*. <https://ut.ac.ir/fa/page>. Accessed September 12, 2022.
- The Guardian Council of the Islamic Republic of Iran. (2007). *20-year vision document of the Islamic Republic of Iran*. <https://www.shora-gc.ir/fa/news/303/>. Accessed September 25, 2022.
- The parliament of Islamic council of Iran. (2011). *The Law of the Fifth Five-Year Development Plan of the Islamic Republic of Iran (2010-2014)*. <https://rc.majlis.ir/fa/law/show/790196>. Accessed September 20, 2022.
- The parliament of Islamic council of Iran. (2005). *Law of Ministry of science, research and technology (2010-2014)*. <https://rc.majlis.ir/fa/law/show/94172>. Accessed September 20, 2022.
- Toulmin, S. (2003). *The Uses of Argument Cambridge University Press*. Cambridge, UK.
- Van Eemeren, F.H., Henkemans, A.F.S. and Grootendorst, R. (2002). *Argumentation: Analysis, evaluation, presentation*. Routledge.
- Van Eemeren, F. H., Grootendorst, R., & Kruiger, T. (2019). *Handbook of argumentation theory: A critical survey of classical backgrounds and modern studies* (Vol. 7). Walter de Gruyter GmbH & Co KG.
- Van den Akker, J., Kuiper, W., & Hameyer, U. (2003). Curriculum perspectives: An introduction. *Curriculum Landscapes and Trends*, 1-10. Springer, Dordrecht. https://doi.org/10.1007/978-94-017-1205-7_1
- Von Aufschnaiter, C., Erduran, S., Osborne, J. & Simon, S. (2008). Arguing to learn and learning to argue: Case studies of how students' argumentation relates to their scientific knowledge. *Journal of Research in Science Teaching: The Official Journal of the National Association for Research in Science Teaching*, 45(1), 101-131.
- Walton, D.N. (1990). What is reasoning? What is an argument? *The Journal of Philosophy*, 87(8), 399-419.
- Walton, D. (2000). The place of dialogue theory in logic, computer science and communication studies. *Synthese*, 123(3), 327-346.

- Wolfe, C.R. (2011). Argumentation across the curriculum. *Written Communication*, 28(2), 193-219.
- Zimmerman, C. (2007). The development of scientific thinking skills in elementary and middle school. *Developmental Review*, 27(2), 172-223.
- Zohar, A. and Dori, Y.J. (2003). Higher order thinking skills and low-achieving students: Are they mutually exclusive? *Journal of Learning Sciences*, 12(2), 145-181.