



Constructivism in Education with Teaching Logic in Universities of Viet Nam

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Published Online: 02 July 2021	According to our survey, most students are not interested and afraid of Logic. Every year, over 700,000 university and college students have to study this subject out of nearly 2 million students of 521 universities and colleges (Ministry of Education and Training 2020). The logic course consists of about 2-4 credits, depending on the program structure of each university. Thus, the impact of the study of Logic on the general knowledge of students is not tiny. So how to improve the quality of teaching and learning this subject? In this paper, we will present some answers to this question, using Constructivism in teaching.
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INTRODUCTION

By 2020, Vietnam has 346 universities, 346 colleges, and 29 university campuses in the military and public security sectors. The total number of students in these institutions is about 2 million (out of 96 million Vietnamese people). Thus, every year, about 700,000 students have to study this subject. Furthermore, Logic can provide students with a general method of thinking because of its specificity, equipping them with the knowledge that will be used throughout their lives; it is also used more than the professional knowledge in which students are trained. Therefore, improving the quality of teaching logic is very necessary and urgent. There are many theories to enhance the quality of teaching and learning (Bernd Meier – Nguyen Van Cuong, 2019). In this paper, we will study the use of Constructivism. The article has three parts. Part one presents the basic content Logic is taught at Vietnamese universities today; Part two presents the essential content of Constructivism; Part three presents some suggestions to improve the effectiveness of teaching General Logic, which is applied from Constructivism. Finally, we make some recommendations.

1. BASIC CONTENT LOGIC IS TAUGHT AT VIETNAMESE UNIVERSITIES

"General logic" is a subject belong to the university training program by credit, in the group of basic knowledge, to equip general logic knowledge for students of the Social Sciences and Humanities majors, Natural Science, Economic Science, Law Science... of all Vietnamese universities. However, depending on the discipline of each institution, the Logic subject has a volume of 2, 3, or 4 credits (Nguyen Thuy Van – Nguyen Anh Tuan, 2008). And one of the essential bases

for building the curriculum is the educational philosophy (Tran Minh Hieu, 2019).

1.1. Objectives of Logic

Logic is the study of the laws, the rules of thought for reaching the truth. That means Logic is a system, or mode, of reasoning. Almost everyone uses Logic, from the seven-year-old questioning their parents, to the salesman promoting his wares, to the politician seeking election. Thus, this subject occupies the position, which is especially important for forming and developing logical thinking, right, and creativity for human beings. Logics has the following primary goals.

- Knowledge: Provide some basic knowledge as the minimum means to train and improve thinking skills for learners, help learners to think fast, exactly, strong argument, prove, Rejected convincingly, brief thoughts, precise, clear, coherent, know the right things, false, shifty, sophisticated in thinking, opinions of others provide some scenarios, especially in situations involving politics, economy, society, legislation (legislative, executive, judicial) and some everyday problems for students to apply knowledge learned in practical activities.
- Skills: To form and develop the capacity of scientific thinking, logical thinking; Adopting logical forms and ways of thinking to increase speed and quality of thought; Be skilled in detecting logical errors in the review of others; form and develop the application of Logic to the research, other subjects, especially professional subjects and professional activities in the future.
- Attitude: Having a habit of logical thinking, actively improving analytical thinking, and applying it to practical

activities. Having an objective attitude, more scientific in object evaluation, phenomena.

d. Other objectives: To train the ability to think independently based on analytical knowledge. Train your creative thinking, explore and explore, improve, develop assessment capacity as a necessity.

1.2. Basic content of Logic in Universities and Colleges of Viet Nam

The Logic taught at universities and colleges in Vietnam is of short length; it consists of the following principal contents: 1 / Introduction to Logic, 2 / The basic rules of Logic, 3 / Concept, 4 / Judgment, 5 / Inference, 6 / Hypothesis, proof, reject and sophistry (Nguyễn Thúy Vân – Nguyễn Anh Tuấn, 2008). This program complies with the higher education program issued by the Ministry of Education and Training in 1995 and 1998, of which the Introduction to Logic, code 051 (TR) 201.

2.1. Program: 5 chapters

Chapter I: Introduction to Logic

1. Object of Logic
2. History of the formation and development of Logic
3. The Meaning of Studying Logic
4. Some commonly used symbols

Chapter II. The basic rules of thinking

1. What are the rules and the basic rules?
2. Basic laws of Thinking
 - 2.1. Law of uniting
 - 2.2. Law (forbid) of contradictions
 - 2.3. Law of the excluded third
 - 2.4. Law of full

Chapter III. Concept

1. What is the concept?
2. Conceptualization
3. Relationship between concept and words
4. Conceptual classification
5. Logical structure of the concept

2.2. Examination and evaluation of study results

2.2.1. Periodic assessment

Table 1: Periodic assessment

Check Form	Weight	The number of tests	Form of tests	Time of completion
Check middle-semester	10 %	1	Writing	After 8 weeks
Writing synthesis	10 %	1	Test of multichoice	After 11 weeks
Final examination of semester	80 %	1	Test of multichoice	After 15 weeks

2.2.2. Evaluation

In check middle-semester (writing): Write an essay (1 to 2 A4 pages). Content: Students select the topic and do the topic outside the class following the orientation assigned by the teacher to the student in the sixth week. Evaluation criteria: in-depth analysis, correct problem focus (5 points / 10 points); Accurate language, clear arguments, coherent (2 points / 10); Describe the situation in which it relates to the

6. Narrow and expand the concept
7. Relationship between concepts
8. Definition of concept
9. Conceptual division

Chapter IV. Judge

1. What is Judgment?
2. The structure of the single statement
3. Relationship between judgment and sentence
4. Judgment classification
5. The completeness, clarity of the terminology in judgment
6. Relationship between the basic judgments (A, I, E, O) - Logical square
7. Logical associations on the statement
8. The method of tabulation to calculate the logical value of the complex predicate (proof formula)
9. The truth value of the judgments - Some equivalents

Chapter V. Inference

1. What is the inference?
2. Inference classification
3. Interpretation (inference)
 - 3.1. Inference directly
 - 3.2. Interpretation indirectly: syllogism
 - 3.2.1. Single syllogism moaned
 - 3.2.2. Truncated short paragraph
 - 3.2.3. Tam argues with conditions
 - 3.2.4. Trilogy of choice
 - 3.2.5. There are complex paragraphs
 - 3.2.6. A method of analyzing the logical mixture of an inference
4. Inductive Inference
5. Exclusion inference

Chapter VI. Hypothesis, proof, reject, and sophistry

1. Hypothesis
2. Proof
3. Reject
4. Sophists

discipline (2 points / 10 points); Personal marks (i.e. it hasn't based on someone else's post) (1 point / 10). The total is 10 points (Tran Minh Hieu, 2019).

Providing knowledge to learners here means, mainly to make students understand the basic knowledge about thinking and the rules and laws of right thinking. But "Understanding" is a multi-meaningful category and has many ways of conception. It can be seen from the perspective of four levels

of knowledge absorption by learners from the point of view of education: imitate - reproduce - reproduce - create. They can view them from the perspective of learning theory: understanding is the process of going from "transmission" to "construction." And it can also be considered from the point of view of philosophical perception: understanding is the process of going from vivid visualization to abstract thinking, from abstract thinking back to reality. Although the approaches are different, the common point in the goal of "Understanding" is to make learners take the initiative in acquiring knowledge and use it flexibly in specific situations.

Looking at the current practice of studying "General Logic," there are a few highlights. On the part of learners, most students are not interested in this subject, even afraid of a topic about "Thinking"; understanding the knowledge of thinking stops at the level of "imitation, reproduction." The ability to apply this knowledge in real-life situations is still relatively low and has not been given serious attention. From the lecturer's side, teaching is still mainly "transmission"... If put in the current trend of capacity-oriented education reform, this practice shows that there are still many shortcomings. There are many reasons for this inadequacy. From the perspective of a lecturer teaching "General Logic," we would like to present a few "Thoughts on improving the quality of teaching General Logic by using Constructivism.

2. BASIC CONTENT OF THE CONSTRUCTIVIST THEORY OF TEACHING

The constructivist view of teaching holds that learners need to understand the objective world by synthesizing new experiences into what they already have. It assumes that learners construct their knowledge by manipulating ideas and approaches based on prior knowledge and experiences, applying them to new situations, and forming a unified whole newly acquired knowledge with existing knowledge in mind (Erst von Glasersfeld, 1989); Erst von Glasersfeld, 1989, Seema Gupta, 2011, Tran Minh Hieu, 2018, Michael R. Matthews, 1997, 1998, Sarita, Poonam, 2017, Do van Cuong, 2008). According to these authors, Constructivism is an approach to "Teaching" based on research on "Learning" with the belief that knowledge created by each learner will become much more solid compared to the fact that others acknowledge it." Thus, the core of Constructivism in teaching: considers learning as a process of cognitive transformation, actively building knowledge from the learners' existing experiences. Jean Piaget (1896 - 1983) and Lev Semyonovich Vygotsky (1896 - 1934) are considered the founders of Constructivism.

Jean Piaget said: "Ideas should be created by children, not found like a pebble or received from another person as a gift" (Jean Piaget, 2018). According to him, cognitive structures are not innate, but they have a history of arising and development, formed from two mechanisms of assimilation and accommodation. Assimilation is when the subject (human) receives and processes new information from the

surrounding environment to achieve cognitive goals thanks to previous experiences. In teaching, assimilation is how learners apply their existing knowledge and skills to solve new learning situations. And accommodation is how the subject adapts to a new event from the impacting environment and transforms the old perception to suit the nature of the impact event. Therefore, new knowledge is formed and added to the existing knowledge system when the unique learning situation is solved. Thus, through the two activities of assimilation and accommodation within the learner, knowledge, and skills are built.

Sharing the same opinion on learners' initiative in knowledge construction, but Lev Semyonovich Vygotsky focuses on the interactive relationship of learners with the external social and cultural environment. He thinks that if learners are placed in a stimulating environment, they can reach a new cognitive stage faster and more effectively. That environment includes culture, language, social interaction conditions, etc., which will directly affect the knowledge creation of each individual. Along with the concept of knowledge construction associated with environmental interaction, L. S. Vygotsky also introduced the "proximal development zone" idea." According to him, each individual has a zone of proximal growth - expressing his growth potential. This area has been prepared in advance due to the cognitive development process, but the learner has not yet reached it. Through learning activities, especially with the help of teachers, learners can achieve it. Next, the development zone, which was further away than before, will become the nearest development zone. The process repeats itself, and the learner goes from one ladder to another in activity and development.

In short, if the cognitive theory of dialectical materialism holds that the human mental process goes from vivid intuition to abstract thinking in a way that opposites "overcome-overlook" transform each other. Then the constructivist theory is approached from educational psychology, explaining the psychological mechanism of perception and cognitive development. Teaching from a constructivist perspective is a type of teaching that delves into the inner transformation of the mental process, understanding the learner's receiving mechanism. The method of acquiring learners' knowledge depends heavily on the available cognitive capacity and the relationship between experience and new things to be accepted. In the process of knowledge formation, social interaction plays a vital role. If placed in an appropriate learning environment, the process of transforming learners' perceptions will take place quickly and effectively (Qiong Jia, 1997, Steve Olusegun, 201, Virginia Richardson, 1997, Sunita Sharma and Divya Bansal, 2017). The biggest suggestion from Constructivist theory for teaching General Logic that we draw is to find a way to increase students' initiative and experience in practice thinking, thereby "Understand," to "Permeate" more knowledge about the rules and laws of right thinking. We

want to focus on two ways: one is to create a constructive learning environment, the other is to implement the formative assessment.

3. SOME SUGGESTION TO IMPROVE THE EFFECTIVENESS OF TEACHING GENERAL LOGIC

3.1. Suggestions from the specificity of the subject "General logic."

Somebody can tell that the most prominent feature of "General Logic" lies in the research object: the study of thinking and the rules and laws of correct thinking. Although thinking activity is ubiquitous, the problems of the nature of thought or its internal laws are "mysteries" to many people. The nature of thinking often reveals itself not simply but rich forms, with diverse manifestations of ordinary thinking - scientific thinking, child thinking - adult thinking - experiential thinking - theoretical thinking with real and specific situations. Therefore, for people, thought is both close and far away. However, for university students - who have "self-study and self-research capabilities," equipping them with basic knowledge about the principles and laws of right thinking is necessary and necessary to strengthen that capacity and is also essential before entering the stage of learning specialized subjects. To understand its forms and principles, students must first receive theoretical content and then solve exercises. Students are considered passing when they pass the midterm and final exams with the standard score. However, as lecturers of this subject, we have concerns that students may have "passed" in grades. Still, it is not confident that they have "passed" in terms of absorption, interest, and the ability to apply the proper rules thinking later. These are qualitative aspects, difficult to measure quantitatively. Therefore, as mentioned above, based on the constructive theory of teaching, we would like to present some thoughts to improve the learning quality of "General Logic" in two contents: building construct a productive learning environment and implement a constructive assessment method (Tran Minh Hieu, 2018, 2021).

3.2. Building a constructive learning environment in teaching and learning General Logic

To achieve general logic knowledge, students need to master the theory and apply it in exercises. However, from the constructivist view of learning, learners only really understand what they construct for themselves. With that spirit, building a learning environment such that students can experience the most direct and exciting thinking practice, through which they will naturally "eureka" the principles, the law of thought, is fundamental.

A presentation is a form we have used for a long time. The students had preparation, self-reading, self-study, searching for rich materials outside the textbook, giving illustrative examples, and joint exercises for the whole class to prepare for the exhibition. Based on the student group's presentation, we will provide comments, suggestions,

additions, and arguments, thereby helping students understand the lesson better. However, the effectiveness of the exhibition was only shown to the group of students who presented, but not much to the rest of the students. As listeners, they are pretty passive in the exchange and discussion if they do not observe, especially when the presentation is the product of the "self-reading and self-study" of classmates. Therefore, creating a broader environment that can attract and encourage more students to participate is necessary.

Discussion in the form of a debate between groups in class is a form that they should emphasize. In debate, students will reveal many emotional thinking habits, lacking Logic, violating the rules and laws of thinking that they usually do not recognize. For the quality of debate to be effective, it is first necessary to choose topical topics associated with the reality of social life. If they are students of Humanities and Social Sciences, students of Natural Sciences, I will suggest reading articles on the "Perspective" section of Vnexpress.vn e-newspaper to find topics. It is there to mention the knowledge and information related to the economy and reveal coherent, logical thinking rules. The issues for debate are pretty rich, up-to-date, comprehensive, covered from many different angles by people from other professions. The common feature is that they are always logical reasoning, thorough analysis, and thought-provoking. Therefore, readers' comments and feedback below the article are also very high, even sharp. Criticisms can support, oppose or add additional data and information, helping other readers have a multi-dimensional view.

If they are students of Economic Science, I suggest watching the TV show "Shark tank – Billion dollar deal" on VTV3. It is there to mention the knowledge and information related to the economy and reveal coherent, logical thinking rules. Following the presentation of startup projects by young people and the critical questions of investors, those with experience in the market will see the concretization of the violation of the laws of privacy thinking or logical errors in deductive reasoning and proof. Suppose they are students of the Faculty of Law. In that case, you can watch some categories such as: "The Court of Sentence" on channel VTV6 - a program that helps the audience, especially young people, have more understanding of the law and society through the re-enactment of cases and psychological developments of the characters in that case; or on channel VTV9 there is a program "A story a day" about fraud cases and related legal issues, "Casefile" is a program that reconstructs matters related to love, marriage, family and legal advice... The topics that breathe life are associated with a high content of logical thinking, vivid illustrations of thought theories, and the rules and laws of right thinking, which will surely attract students' attention. Based on such topics, groups of students will debate, search for logical arguments, plus team mentality will create exciting and memorable lessons.

It is worth noting that although the above activities have many practicalities if the class only lasts from 2 to 3 hours in a class, there is enough time for all groups and topics. We think this is the time to use information technology to fix the problem. Cyberspaces allow us to expand much more than the "physical space" in the classroom. If the issues discussed in class are not finished, we can put them on online forums, closed groups with students. The extension and expansion of learning time and learning space by using information technology is a unique point in building the constructivist learning environment that we want to mention. If we think that the lesson's focus is on the students' hands-on experience of thinking rather than a matter of time or space, we will overcome these obstacles. To experience the most practical thinking, thereby understanding logical theories and simultaneously carrying out these activities, it is necessary to have a formative assessment from the lecturers.

3.3. Carrying out construction assessment in teaching General Logic

As a rule, the lecturer can evaluate students in their way with a weighted score of up to 40% (through attendance and midterm grades); the rest should be in a general way (60%). Thus, lecturers can develop a plan to evaluate students according to their ability in a prosperous manner within the allowable range. Closely following students' thinking experiences through presentations, discussions, debates, group work skills, even capturing individual students, groups of students can be a demanding job, a lot of efforts of lecturers. Still, it is an irreplaceable method if you want to evaluate according to capacity. Such an assessment ensures accuracy, fairness and gives students a comfortable and secure position in studying this subject. The teacher's assessment can also be combined with the student's assessment when we let them self-assess (Tran Minh Hieu, 2018).

4. CONCLUSIONS AND RECOMMENDATIONS

1. Teaching is one of the main activities of education. Following the trend of education reform towards competence, teaching needs to be pondered and changed. Suppose it is impossible to improve at once and simultaneously all elements of the teaching model, then in the spirit of Constructive Theory. In that case, we - who teach "General Logic" - can change one or two of them, such as building a constructive learning environment and implementing a productive assessment method.

2. The purpose of these changes is so that students studying this subject can understand the knowledge about thinking as well as the rules and laws of correct thinking in the most "experiential" way, "most practical." Those are the things that are right in front of us. Under our conditions, we can do it. Putting students at the center of learning General Logic requires more work from lecturers to plan, organize, design, and capture the psychology or "nearest zone of development."

To do this, a single lecturer is not enough, but needs the combination and teamwork of many lecturers, like the folk saying of our grandparents "If you want to go fast, go alone. If you're going to go far away, go together".

3. Everyone needs Knowledge of Logic. The knowledge about it learned in school will go throughout their life, so it is necessary to teach this subject early in high school or teach it at the high school level, not only go to university, college students can study. That is too late.

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