

формируются навыки письменно и устно излагать результаты своих исследований по предложенной теме, анализировать многочисленные источники информации и выявлять важную информацию.

Далее было предложено задание – интервью. Приглашался один участник от группы, который выбирал карточку с каким-либо известным человеком. Члены противоположной команды должны задавать ему вопросы, касающиеся режима дня и хобби. Следовательно, у учащихся развивается мышление, воображение, память и творческие способности.

И последнее задание – разгадывание кроссворда, что способствует развитию языковой догадки, расширяет кругозор, способствует развитию навыков письма и мышления.

Таким образом, виды познавательной деятельности, такие как проектная деятельность, проблемный подход, поисковое чтение, нетрадиционные формы урока и ролевые игры с использованием ИКТ на уроках английского языка студентов первого курса доказывают успешность формирования учебно-познавательной компетенции в процессе обучения иностранному языку [1].

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Mayer R.V.

Doctor of Pedagogical Sciences, docent,
The Glazov State Pedagogical Institute,
Glazov, Russian Federation

ABOUT ESTIMATION OF THE INFORMATIVENESS AND DIDACTIC COMPLEXITY OF PICTURES

Abstract

For assessment of the informativeness and didactic complexity of picture it needs to replace the picture with a full but short description and count the quantity and complexity of the used concepts. It is possible to calculate the objects and links in the picture taking into account their abstractness degree. The results can be used to assess the complexity of textbooks or technique of training.

Keywords

Complexity, concept, content analysis, didactics, educational text, expert assessment, training, training material, qualimetry.

Development of the training theory and technique assume measurement and accounting of didactic characteristics of various learning material elements (LMEs): concepts, fragments of the theory, text blocks, pictures, tasks, educational experiments [2]. The main didactic characteristics of the LME are: 1) informativeness (or informational content), that is the quantity of information included in this LME; 2) the didactic complexity characterizing the amount of efforts and time which are necessary for a pupil to assimilate this LME. The problem of the complexity assessment of the educational text and its components has the great practical importance. Teachers and school students, comparing various subject matters, intuitively "react" to the level of abstractness of the studied questions. V.P. Bespalko notes that pupils, comparing various subjects, intuitively "react" to the degree of abstractness of the studied issues, therefore the complexity criterion of the educational text, first of all, is its theoretical nature and abstractness degree [1]. It depends on a ratio between the pupil's experience and the content

of a training material. The greater the complexity and lower the level of the pupil's knowledge, the more difficult is the training material for the student and the less is its theoretical availability. Ya.A. Mikk claims that "scientific character of material without availability is senselessly: there is no sense to train if pupils can not acquire the training material" [2]. The main objective of this paper is the development and use of the method of the assessment didactic complexity (DC) and the quantity of information (QI) of pictures. Let us name the didactic complexity of LME as the dimensionless value proportional to the amount of efforts and time of studying to be used by the 5th class pupil (or the person who graduated school long ago) to understand and acquire this LME.

For DC assessment of a picture we can replace the picture with a full, but extremely short description and count the quantity and complexity of the used concepts [3, 4]. Another approach demands estimation of quantity and the abstractness degree of the depicted objects and links between them. Let us list some examples of such links: the interaction the Sun – the Earth, the thread connecting two bodies, the relationships of cause and effect, the perpendiculars lowered on coordinate axes. The abstractness criterion of an object (or links) is the impossibility for the pupil to observe this object (link) or another object similar to it directly, to sense it. For DC assessment of the picture it is necessary to define: 1) the number x_1 of the physical objects images which the pupil can observe, sensing it directly; 2) the number x_2 of physical links which the pupil can observe (e.g. the galvanometer is connected to the coil; the microphone is located opposite the loudspeaker; the acid is poured in a flask; the thermometer is lowered into the liquid, etc.); 3) the number x_3 of images of the really existing physical objects which the schoolchild can not sense and needs to imagine (e.g. an atom, an electron, a chromosome, an electro-magnetic field); 4) the number of links which the pupil can not sense and needs to imagine them (e.g. chemical links, an attraction of electrons to an atomic nucleus, the abstract links represented in the form of arrows); 5) the number x_5 of the mathematical abstractions (the mathematical formulas and designations, geometrical figures and bodies, vectors, coordinate axes, graphs); 6) the number x_6 of the legends (inscriptions), that denote the objects (phenomena) which the pupil can observe (legends "the Sun", "petrol", "cell"). 7. The number x_7 of the legends, that designate the objects (phenomena) which the pupil can not sense and he/she needs to imagine them (e.g. legends "HNO₃", "quarks", "leukocytes"). The picture can contain m conventional designations of really existing objects which the pupils can sense. So, the scheme of an electric chain consists of abstract elements corresponding to the real objects which the pupil can observe and touch. In this case it is also necessary to increase x_1 and x_3 by $m/2$.

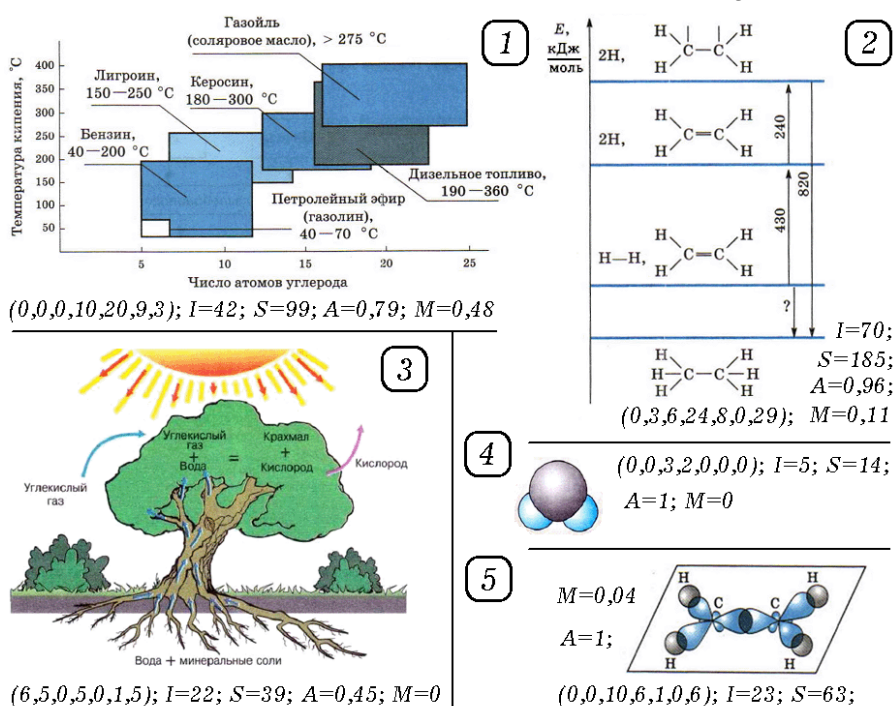


Fig. 1 – The estimation results of didactic complexity of pictures.

The general informativeness I of a picture and the abstract information quantity I_A are equal (in concepts): $I = x_1 + x_2 + \dots + x_7$, $I_A = x_3 + x_4 + x_5 + x_7$. The abstractness coefficient A and the share of mathematical information M are given by formulas: $A = I_A / I$, $M = x_5 / I$. The didactic complexity of a picture is equal to its informativeness taking into account the complexity of the elements entering it; DC is defined by the weighted sum $S = (I - I_A) + \alpha I_A = I + (\alpha - 1)I_A$, where α – the weight factor exceeding 1. As the transition to an other qualitative level is connected with the increasing of the appropriate quality amount in $e = 2,72\dots$ times, then we assume that $\alpha = 2,72$. Fig. 1 shows five pictures from school textbooks on natural sciences subjects; nearby the vector of characteristics $(x_1, x_2, x_3, \dots, x_7)$, the informativeness I , the coefficients A , M and the didactic complexity S are given. The received values allow to compare pictures on their didactic complexity DC and informativeness QI. For example, it is visible that fig. 1.1 is twice as informative as fig. 1.3 or 1.5, and its DC is 1,5 times more, than DC of fig. 1.5.

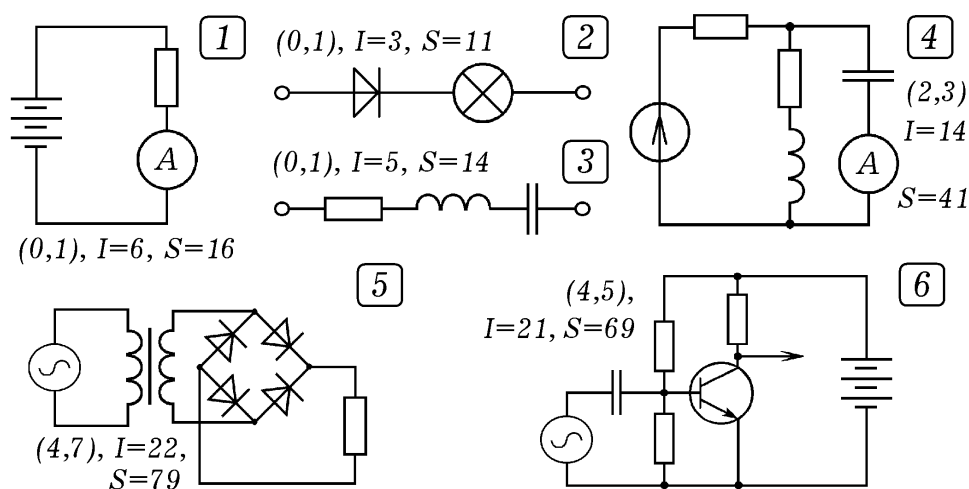


Fig. 2 – Schematic diagrams of electrical circuits, their QI and DC

For QI and DS assessment of an electrical circuit (fig. 2) it is necessary to make its verbal description. For example (fig. 2.4): "The chain consists of the alternating voltage source, and has two knots and three branches. Branch 1: the generator and the resistor are connected in series. Branch 2: the resistor and an inductance coil are connected in series. Branch 3: the capacitor and the ammeter are connected in series". After that it is necessary to count all concepts and to summarize their complexities s_i . There is another approach, consisting in the use of the computer program that analyzes the file containing a list of all the devices included in the given electric circuit and asks questions about the number of nodes and branches in it. The program works with the dictionary thesaurus; it is the text file "shema.txt" which lists the names of devices (the resistor, the capacitor, an operational amplifier, etc.) and for each device the complexity is specified (in format: "the name of the device", s_i). Here is a fragment of this file: "... resistor 3, capacitor 3, coil 1, inductance 2, voltmeter 3, ammeter 3, wattmeter 3, diode 4, transistor 5, ...". The task of the expert is to create the text file corresponding to the considered electric circuit, to define the number of the x_1 nodes, the number of branches of x_2 and, having started the program, to enter these data. The program gives out: 1) the quantity of information (QI) in the circuit, which is equal to the sum of all concepts N used in the verbal description: $I = N$; 2) the circuit DC $S = s_1 + s_2 + \dots + s_N + 3x_1 + 5x_2$, where s_i – complexity of the i – th concepts on a scale 1 – 2 – 3 – 4 – 5. Fig. 2 shows the resulting estimates of informativeness I and DC S of six electrical circuits. When estimating circuit transistor amplifier (fig. 2.6) the file "shema.txt" contains the following text: "a battery of electrochemical cells, AC voltage source, capacitor, resistor, resistors, resistor, transistor"; $x_1 = 4$, $x_2 = 5$. Each circuit diagram corresponds the vector (x_1, x_2) , the quantity of information (QI) I and the didactic

complexity (DC) S . Coefficients $A = 0,5$, $M = 0$. The received results can be applied for a assessment of informational content and didactic complexity of the nature science textbooks.

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Махова А.В.

канд. экон. наук, доцент кафедры социально-экономических дисциплин
ФГБОУ ВПО «Кубанский государственный университет»
филиал в г. Славянск-на-Кубани, РФ
E-mail: mahova.av05@yandex.ru

Ашарян М.

студентка 5 курса направления подготовки
«Педагогическое образование»,
профилей «Экономика» и «Право»
E-mail: bmanush@mail.ru

ДИСЦИПЛИНА «ЭКОНОМИКА» В СИСТЕМЕ ПОДГОТОВКИ СРЕДНЕГО ПРОФЕССИОНАЛЬНОГО ОБРАЗОВАНИЯ, ОБУЧАЮЩИХСЯ ПО СПЕЦИАЛЬНОСТИ «ПРАВО И ОРГАНИЗАЦИЯ СОЦИАЛЬНОГО ОБЕСПЕЧЕНИЯ» ОЧНОЙ ФОРМЫ ОБУЧЕНИЯ

Аннотация

В статье раскрываются цель, задачи и содержание дисциплины «Экономика», а также место данной дисциплины в системе подготовки среднего профессионального образования, обучающихся по специальности «Право и организация социального обеспечения» очной формы обучения.

Ключевые слова

Экономика, цели и задачи дисциплины, компетенции, рабочая программа.

В современной России мы принимаем ежедневное участие в экономической деятельности, живем в экономической среде, постоянно используем термины, употребляемые экономистами (деньги, цены, заработная плата, доходы, расходы и др.).

Экономические знания образуют основу нашего общества: о достоинствах и недостатках экономических систем и вариантов общественного выбора, о трудном выборе между равенством и эффективностью, об избирательном процессе, о деятельности фирм и об организации отраслевых рынков, о маркетинге и менеджменте, о рынке труда, о рынках капитала и денег, о семейной экономике и поведении потребителей, о национальной и мировой экономике и так далее.

Очевидно, что экономически безграмотный человек изначально обречен на более сложный жизненный путь, его решения во многих сферах общественной жизни зачастую будут оказываться ошибочными. Жить