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THE CONCRETUM – MODEL – ABSTRACTUM OR THE SEARCH FOR EFFECTIVE STRATEGIES FOR PROMOTING LEARNER DEVELOPMENT

Annotation. Nowadays there is a process of finding an effective strategy for the training of students. In the pedagogical and psychological literature we can find assumptions of constructivist and personalistic pedagogy. The most reasonable is to educate based on the theory of the educators like Aebli, Bruner and Piaget. The main way of education can be described in words: concrete – model – abstraction

Key words: education, key competences for lifelong learning, learning to learn, programming education, constructivist pedagogy.

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КОНКРЕТ-МОДЕЛЬ-АБСТРАКЦІЯ ЯК СТРАТЕГІЯ ОПТИМІЗАЦІЇ ПРОЦЕСУ НАВЧАННЯ

Анотація. У статті висвітлено шляхи пошуків ефективної стратегії навчання учнів школи. Проаналізовано конструктивістичні і персоналістичні підстави, представлені у педагогічній та психологічній літературі. Автор доводить, що найбільш обґрунтовано навчання на основі теорії виховання представлено у таких педагогів як Аєблі, Брунер, Піаже. Основний шлях навчання може бути описаний за схемою: конкрет – модель – абстракція.

Ключові слова: освіта, ключові компетенції навчання впродовж життя, педагогіка конструктивізму.

Introduction. A continuous process of seeking effective strategies for promoting learner development is still underway, and the dynamics of these explorations is determined by goals and tasks faced by the school, student, child.

The recommendation of the European Parliament as of December 18, 2006, on key competences for lifelong learning (2006/962/EC) defines competences as a combination of knowledge, skills and attitudes appropriate to the context. The authors also use the notion of 'key competences' underlying that these are competences which all individuals need for personal fulfilment and development, active citizenship, social inclusion and employment. All the key competences are considered equally important, because each of them can contribute to a successful life in a knowledge society.

Thinking is a generalised and intermediate process in learning about things and phenomena. Creative thinking is one of the forms of this process based on finding (perceiving) and disclosing new, previously unknown phenomena in nature, social, economic life or technology. (...) A very important role in thinking is played by the so-called prospective imagination, thanks to which a person may break away from mental patterns shaped at school and in everyday life [1].

Analysis of recent research and publications. Thinking, and especially scientific thinking, is included in the set of key competences in the process of lifelong learning. It is worthwhile to analyse the Polish core curriculum in order to try to find an answer to the question: Do and if so, which contents of education (effects) prove the presence of competences under analysis? Which education strategy shall be applied in the process of promoting personality development in learners of grades 1-3?

Setting up educational conditions at the Polish school in such a way as to systematically reach partial, operational goals that enable formation of the above competences is a huge challenge faced by

educational managers, decision-makers as well as Theoreticians, Empiricists and Practitioners in pedagogy.

Modelling early school education is an attempt to seek answers to the following questions: 1) What shall be taught, what contents shall be regarded significant, useful in student's educational and occupational career? 2) In what way shall we teach, how to plan the educational process, so that it is described by attributes such as successful, effective, developing, adequate as regards learner needs and potential?

The concretum – model – abstractum – strategy justification. As regards the answer to the first question, it can be found in the core curriculum currently interpreted as a list of uniform contents and educational effects at a given stage of education and methodological proposals of different publishers.

The answer to the second question is open-ended, has turned out to be unceasing, and its essence can be brought down to the phrase – how to teach?

The assumptions of constructivist pedagogy are worth recommending to a contemporary teacher: (K. Lubomirska, ed., D. Klus-Stańska, M. Nowicka 2005; J. Bałachowicz, 2006; J. Bałachowicz i A. Kowalska, ed. 2006; J. Niemiec, 2006 and other).

The core curriculum of school tasks contains a sentence that constitutes peculiar reference to constructivist assumptions: 'The task of the school is to accomplish the school curriculum focused on a child, his/her individual pace of development and capabilities to learn, (...), to develop child's cognitive predispositions and abilities, form a positive attitude to learning in a child and develop curiosity in getting to know the surrounding world and seeking the truth.'

A similar reference can be found in educational goals: 'the goal of early school education is to assist child development (...). A holistic view of child's personality as an addressee of educational and teaching effects noticeable in the formulation 'the school mildly introduces learners into the world of knowledge, taking into account their harmonious intellectual, ethical, emotional, social and physical development.'

Objectives of general education in primary school include an indication that contents of education should be close to children: 'acquisition by children of the basic store of information about facts, principles, theory and practice related first of all to topics and phenomena close to child's experiences'.

In personalistic pedagogy a child, student himself/herself is the primary value. Pedagogical work shall be preceded by such activities as the diagnosis of school readiness, diagnosis of operational thinking, diagnosis of abilities to cope with such intellectual activities as analysis, synthesis, comparison, cause-and-effect thinking, generalization and abstraction. At the stage of identification of child capabilities and interests it is worthwhile

to establish child personal knowledge resources [2] and intellectual profile [3].

Not diminishing the role of all the components that constitute professional organisation of activity of learners, both in an individual and holistic analysis, the focus of attention is on managing the process of getting to know the reality and acquisition of notions. The core curriculum and curricula based on it provide teachers with recommended conditions and ways of their fulfilment, e.g. as regards natural, social and ethical as well as health education.

Learner's knowledge cannot be developed only on the basis of educational packages, information from the Internet or other similar sources. Education in natural sciences shall also be provided in the natural surrounding outside school. Classrooms shall be equipped with natural science corners. If a school does not offer conditions to grow plants or keep animals, lessons in a botanical garden, on a farm etc. [4] shall be organized for children.

Reports of contemporary educationalists show an interest in a learner as an individual. An individual approach to a learner under the conditions of team work is underlined. Individualized teaching is of an immense didactic value. In the opinion of futurologists, the development of educational forms and methods is directed towards growing individualization, - as noticed by F. Berežnicki [5], and this thesis is supported by others, too. T. Husen states as follows: «The most thorough transformation of working methods at school which can be expected in the future is the development of more or less wholesome individualization of teaching that is going to be the focus of teacher activities [6]».

It is suggested that teachers shall carry out observations of learners in order to discover their interests and plan projects for realization stemming from the needs and capabilities of learners [7].

Theoretical framework and research methods. While providing an overview of didactic strategies proposed to teachers, I would like to outline the ones that promote construction of knowledge among learners but are still not fully implemented although have been described in literature for more than a dozen years. They include functional teaching (the currently applied notion – active learning), the strategy of constructing notions, the strategy of multifaceted education, the operational strategy, the problem-posing and problem-solving strategy of teaching, authentic teaching [8]. This article cannot possibly characterize all the concepts, yet a closer look at functional teaching and the path of constructing notions will at least partially reflect ideas contained in the remaining strategies. All the mentioned concepts underline learner's activity (dynamic methods promoted by J. Dewey and E. Claparèd) [9].

Research results. The content of education is entered in the core curriculum in the form of functions, which underlines the importance of

learner activity. It is expressed by verbs used to describe the effects of education: observes, describes, names, measures, weighs, explains, measures off, organizes, compares etc.

The core curriculum has been formed in the language of requirements (effects, objectives) yet it is at *teacher's discretion* to plan the way towards the attainment of the mentioned effects. Based on the above effects, a teacher plans multifunctionally conditioned lessons with a diverse educational value. Taking into account developmental needs of contemporary students aged 6-10 in the process of teaching – learning, functional methods are worth applying. Functional methods comprise student activities whose elements are physical, manipulation and instrumental activities used to transform reality as well as its research and analysis of theoretical tasks. Application of these methods is regarded indispensable by E. Gruszczyk-Kolczyńska (1997, 2004, 2010) as regards realization of mathematical contents and by D. Cichy (1999 and further on) as regards natural sciences.

These activities shall initially be implemented on real subjects and subsequently on their substitutes (paintings, models, schemata, signs). The teacher task is to plan such educational situations as to enable learners gathering experiences, in their individual stock. Application of functional methods is determined by learner's cognitive schemata, which is indicated by the achievements of developmental psychology (enactive representation, iconic representation and symbolic representation – Bruner, 1978).

The key principle of functional teaching is as follows: practical activity is the source and precondition for the development of psyche, while mental phenomena and images are the reflection of these activities. The theoretical foundation for functional teaching called functional operationalism was worked out in the course of many years of psychological and pedagogical research by J. Piaget [10]. He stated that: practical functions and operations are genetically primary in relation to psychological processes; practical actions are the source of forming of all the psychological areas and intellectual operations; development mainly depends on biological maturity of an organism i.e. maturity of the nervous system and personal activity of an individual, whose level is related to the chronological age.

Hence teaching shall be adapted to learner's development, unroll in line with this development, since its excessive pace is deemed to failure (difficulties and problems exceed the level of psychophysical capabilities of a given learner). It happens that verbal teaching and acquisition of knowledge without understanding results from this dissonance.

Apart from J. Piaget, the Soviet psychologists: Vygotsky, Leontiev, Zaporozhets and Galperin separately dealt with functional teaching, and they underlined the influence of social and pedagogical factors on the

educational progress. The mentioned theoreticians and empiricists are the authors of the theory of accelerated development. Especially Lev Vygotsky stressed the importance of the level of difficulties during selection of educational tasks and teaching contents.

Tasks that outstrip development «urge» a child, promote his/her mental development. It means that not all educational situations are developmental in nature. It happens that they act as «time-fillers» and «learner-amusers». Let us focus on multi-facetedness of promoting development in the proposal of *functional teaching (according to Galpieriin)*: Organisation of learners' orientational functions; organisation of functions: based on concrete material, based on symbolic material, based on schemata.

Organisation of functions in loud speech (teacher's verbal comment about all of his/her own and learner's functions, children are required to «speak»). Speech and content of statements refer to fulfilled tasks and commands: they are an indication (for a teacher) of the extent of comprehension of presented contents. Organisation of functions in quiet speech. Learners themselves comment on accomplished functions, interpret tasks, explain difficulties. (Student-Student; Student-Class; Student-Teacher; Student/Child-Toy). Organisation of intellectual functions (e.g. counting, dividing numbers into elements, solving textual tasks, calculation in one's head). In the course of functional teaching different types of learner activities are observed: manipulation, verbal, intellectual, sensor and emotional activities.

Different forms of memory are involved: visual, auditory, motor and emotional. It is polysensory teaching. In the course of teaching the school shall educate learners about the acquisition of knowledge that will make it possible to understand and alter reality as well as broaden and enrich personal inner life. Education shall arouse initiative, develop interests, stimulate readiness to undertake new forms of activity, develop skills of self-education and self-nurture. The process of contemporary education focuses not only on what is acquired and repeated by a student but also on the type of personality s/he becomes. In the process of teaching-learning a student is a subject with a research attitude who actively transforms the existing situations; undertakes diverse tasks and fulfils actions stemming from the realization of a given teaching task [11].

Conclusions And prospects of further research. One of the major tasks of teaching is to make learners formulate notions from various fields. Notions assemble learner's ordered knowledge about the world. Every notion is reflected in a name, and logicians perceive a notion as a meaning of a name. As a child acquires the store of notions, his/her thinking is transformed from the matter-of-fact and image-based into notional thinking. A notion is a thought about an object, and it reflects general as well as significant features of the classes of objects and not – as in an observation

or image – qualities of a given object. A notion refers to objects of a given class 'in general' and not to specific objects.

For a teacher to properly form notions in his/her learners, s/he should realise the way notions are formed in individual's mind. Notions are formed in subject's mind due to the process of learning about objective reality. This cognition proceeds along the following lines: from direct reflection of reality (observation, perception) via mental processing (different mental functions: analysis, synthesis, comparison, classification, conceptualization, generalization) to practice. Multi-sensual perception occurs when a child comes across specific objects, people, phenomena, environments, situations. Perceptions are the basis for conceptions that feature characteristics of concrete terms (images of objects in the mind). In a notion an individual reflects general properties of a given class of objects as well as relations between these properties. A learner extracts general, common properties, typical of the entire class of objects, from concreta. W. Okoń differentiates between two levels of notions: elementary and higher, scientific level. Initially a child relates a name to an object known to him/her on the outside, can recognize it, knows what it serves for yet, for example, cannot explain the way it functions.

In the course of school education a teacher shall transform, specify, crystallize, supplement many notions in children's minds, especially notions of general nature. When developing notions during classes, we may follow W. Okon's recommendations which outline five stages in the process of the emergence of notions in learner's mind: comparison of an object with other objects, singling it out among other objects (comparison and distinction); searching for common properties of objects in a given class; searching for distinctive features; definition of a notion by a learner based on the knowledge of properties of objects in a given class; application of an acquired notion in a new situation [12].

Taking into account that teaching is based on organisation of learner's cognitive processes that unroll from vivid observation to invention, and subsequently to practice, we shall more closely deal with an issue of practical activity of learners in the teaching-and-educational process and conditions of gathering experiences by children.

Practice in experiencing reality most often occurs when a learner directly influences the surrounding world in order to transform it in a socially beneficial manner while performing in the meantime a number of physical functions with involvement of mental functions. Activity is a feature of temperament which manifests itself in the number and range of undertaken activities of a given stimulating value [13].

Reality surrounding a child/student is a specific, rich and diverse source of information and hence it is informational environment. Pieces of information that are important for a child, stimulate him/her and speed up acquisition of new skills, are a source of motivation for activity and learning.

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