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Yoana Yankulova, Donka Petrova

The Transition from Quantitative to Qualitative Research of Learning in the Educational settings

Abstract: The current article highlights collected facts about the transition in scientific research from quantitative to qualitative approaches to the study of the characteristics of human learning. The analysis of the presented results emphasizes the importance of the qualitative research of learning as a major perspective for the conceptualization and evaluation of human learning through the lifespan of an individual not only on behavioral level, but on cognitive level as well.

Key words: Learning, Qualitative research.

It is well known that the scientific view of the characteristics of human learning have changed over the years depending on the dominant scientific paradigms and the empirical data collected. For example, at the beginning of the development of Educational Psychology the behaviorists claim that individuals participate passively in the process of learning, because they form their individual responses to social stimuli in accordance with the incentives received during training. In this regard, behaviorism formulates the main purpose of learning as increasing the number of correct behavioral manifestations in accordance with the requirements of the environment, and the end results are considered to be important indicators of the changes in individual behavior. In the following decades the cognitive approach emerged, which conceptualize learning as an active process of acquiring new knowledge and a growing ability of their adequate practical application.

The change in the leading theoretical views allows the problem of human learning to be regarded beyond the bounds of strictly experimental settings and abstract stimulus materials, and be moved in real classrooms, where the work is with up to date study material. Cognitive oriented professionals accept that the individual actively participates in

their learning process because he is able to perceive and interpret the incoming information, to construct with own efforts important meanings and knowledge and to form appropriate metacognitive skills for the effective regulation of behavior and learning [1]. Therefore, according to this view, learning is not just passive accumulation and application of a set of facts, mediated by external factors, but is defined as a constructive process that has important impact on the development of the self in the course of upbringing and education.

In the 1970s Ference Marton and his colleagues [2] initiated targeted study of the characteristics of learning in the academic environment (at the Institute of education at the University of Gothenburg, Sweden). These studies led to shift in the orientation of the studies of learning, as it began to be studied from the perspective of the learner himself. Initially, the researchers carried out introspective and intuitive analysis of the results obtained using the explanatory concepts that are found in the responses of the sampled individuals themselves. Later on they introduced the phenomenological approach as an alternative way for an in-depth analysis of not only the consequences but also the prerequisites for learning and educational intentions. Viewed this way learning looks like a smaller model of dynamic development and represents a starting point to achieving qualitatively different ways of understanding the social world. The researchers from Göteborg believe also, that the application of this approach allows for the easier explicit expression of what is transformed into what, and through the accurate identification of separate levels of the understanding of social reality a better explanation of the possible dimensions of change in intellectually-personal development in the course of education can be reached. As a result of the experimental work at the University of Gothenburg qualitatively different levels of understanding in working with specific text have been identified, constituting a unique "combination of different subjective meanings of the same concept or principle, hence the ability to reveal different characteristics of the understanding of a text, distinguishing between understanding and misunderstanding" [3]. It was also established that the levels of understanding can vary from mechanical reproduction of information on the basis of the notes the learner has made during study courses to the construction of his or her own concepts about the study material and the social world [4].

In addition to the study of the levels of understanding of serious interest there are also quantitative differences in the learning process viewed in terms of academic achievements [5]. Experimental studies show that the relationship between the quantitative differences in the learning process and the approaches to learning is rather ambiguous, since the resulting interdependencies are weaker than previously expected. This means that the quantitative differences in the process of students' learning may not be accurate indicators of the quality of their learning, as well as for clarifying those situations in which some individuals, recalling a certain volume of information successfully pass examinations, but without really reaching a thorough understanding of the course material [6].

In the course of their research work Marton and his colleagues carefully analyzed the important explanatory construct of "approaches to learning", as the differences among these possible approaches have been analyzed in terms of intentionality. This means that in an attempt to clarify the nature and the specific characteristics of the different approaches to learning the researchers have focused on the specific intentions of the participants in the study when working with scientific texts and how they realize them in practice [7]. The researchers from Göteborg also indicate that the approaches to learning are not permanent personal characteristics, but are variable because they are an expression of the specific individual reactions in solving specific tasks in the academic context. It should be borne in mind, however, that the evidence for this are ambiguous, since the studies of approaches to learning show both consistency and variability depending on the methods of measurement, the instruction of test specifics of the tasks, the so of the experimental context, etc.

Besides the study of the characteristics of approaches to learning, researchers in the field of Educational Psychology also pay much attention to how they are influenced by cognitive and personality characteristics, the teaching material and the educational context. For example one study [8] reveals that cognitive interest and the level of personal anxiety have a strong influence on the choice of an approach to learning. But the direction of such an influence is not entirely unambiguous, since there can be strongly argued that the anxiety-provoking situations require the use of a superficial approach to learning. In addition, there are cases where some individuals perceive a situation as threatening, and then they tend to cling to superficial thinking and learning, because they are mostly occupied with the

preparation of the questions that will eventually be asked at the end, without efforts at thorough understanding.

Therefore, the empirical data accumulated up to now indicates that the dichotomy superficial - in-depth approach greatly depends on how the study task is perceived and what ways to solving it are applied. In addition, the choice of a superficial or an in-depth approach is strongly influenced by the individual characteristics of learners, the characteristics of the discipline studied, methods of teaching and evaluation, as well as other dynamic influences of the educational environment. When choosing a relevant approach to successful learning ways of understanding and processing of incoming outside academic information are also important. Research [9] suggests a correlation between the subjective understanding of the structure and content of educational material and qualitative differences in the results obtained. Furthermore, it is discovered that some research participants do not understand that the constituent parts of the experimental text can be meaningfully and semantically structured on various levels and, as a result, show incomplete and fragmental recall of the text.

The arrangement of the essential parts of the text is usually influenced by the individual assessment of their value and importance, as well as the strength and direction of the cognitive interests. The results of the investigation [10] show the existence of a hierarchical relationship between the different levels of understanding and processing of information. The existence of such a hierarchy in the levels of understanding in working with text has been confirmed by other researchers [11]. Some of them [12] underline that there is horizontalization in terms of choice of perspective in the process of learning, as well as in relation to manifestation of individual features when working with text, while for other authors [13] focus on how the intentionality of the behavior manifests itself in an adequate understanding of the main ideas in the text, which are illustrated with relevant examples.

There are authors [14] for which learning is constructive process directly related to the cognitive processing of incoming information from the outside world. This information processing is determined by the active search of interrelations between the different parts of the course material, by the depth of logical reasoning and the ability to remember certain information. It is assumed also that part of the process of learning is its meta-cognitive

regulation related to the possibilities for course planning, monitoring and evaluation of own progress and for diagnosis of the causes of learning difficulties.

All these regulatory strategies are an expression of the dynamic side of learning, as with their help the information processing is given a particular direction. The static aspect of learning can be assessed by the rate of utilization of the knowledge, by the ways of forming of individual beliefs and of the characteristics of the created concepts for learning. An important part of the learning process is also the educational orientations, which are based on the personal goals, intentions, expectations, motives, attitudes, mental models of learning. Speaking about mental models of learning and educational orientations it should be noted that they exert a strong influence on the processing of information, although their impact is more indirect and mediated by the implemented regulatory strategies.

The theme of the characteristics of the information processing and behavior intentions in the management of events happening in the learning process, is very important in the learning model of Mayer [15]. According to this model learning is interpreted as an accumulation of the evaluations of the personality and behavioral changes, of the cognitive abilities and the results achieved. Meyer believes that as a result of the influence of individual characteristics and of the context each person in the process of learning accumulates enough knowledge about the self and the social world. People, however, can construct their knowledge not only on the basis of the immediate observations, but also using the experience acquired during social interactions with others. This idea is embedded in the model of learning proposed by John Biggs - „Predicting/ process/ results” [16], originally developed on the principles of the minimalist constructivism. Later, however, the author turned to the need for qualitative in-depth study of learning defined in his views as an active, purposeful and constructive process. This way Biggs overcomes the narrow focus on the achievements, typical for cognitive psychology, and avoids the creation of an unrealistic picture which features the individual only, and ignores the influence of the educational context.

Biggs [17] states that there exists a linear progression between predicting outcomes, the process of learning and the final results, and through constant interaction between them a dynamic equilibrium in the entire system can be reached. Each of these factors contains

different in their number and characteristics components. For example, the factor "predicting" encompasses the totality of personal assumptions on the development of the learning process, the previous knowledge, the possibilities for the development of intellectual abilities, the personal values and expectations for achievements, as well as the attitudes about the preliminary dispositions and attitudes towards engaging in a variety of cognitive activities. The influence of this factor depends also on the personal characteristics of trainers (teachers, University professors), on the methods of teaching and evaluation and on the special features of the curriculum. The second factor in the model "Predicting/ process/ results" encompasses the approaches to learning which combine the motives for learning and their corresponding motivational strategies. For example, when using an in-depth approach to learning, the individual focuses mainly on the content of the task, working for its proper understanding and for its successful resolution. If a superficial approach is applied minimal effort are used to solve the study problem, while a in a case of strong orientation towards achievements there is a strong desire for achieving high academic results, without, however, the intention for a deeper understanding of the task. It is considered that the relationship between the approaches to learning and the end results are mediated by personality factors (such as locus of control) and by different contextual influences that also need to be studied very carefully.

The third factor in the model „Predicting/ process/ results“ is associated with outcomes that can be measured quantitatively - what is learned and qualitatively – how well the knowledge is absorbed. For the purposes of assessing the quality the principles of authentic assessment can be used, also the phenomenological method or more generalized taxonomies, such as the Structure of the Observed Learning Outcome/ SOLO [18]. This taxonomy emphasizes that the individual levels of understanding and the end results are specific expressions of the achieved quality of learning. The evaluation of the results achieved may vary from the study of the extent to which individuals cope successfully and completely on their own with the task to the study of the extent to which they achieve a correct understanding and a critical awareness of the learning material. Special emphasis in this taxonomy is placed on the feedback and its strong influence on the personal expectations and life plans, through which can be reached better opportunities for adequate

metaeducational decisions and higher level of motivation for learning and for achievements. Therefore, the Structure of the Observed Learning Outcome allows for the generation of new ways for more precise evaluation of the quality of the acquired knowledge as well as the learning results that has been achieved [19].

Another no less interesting model of learning is offered by Noel Entwistle and Paul Ramsden, who, drawing on collected empirical data, make a thorough analysis of various research perspectives [20]. These authors state that qualitatively different forms of motivation for learning behaviours are a result of the educational intentions and of the approaches that are used to solve study tasks. They discover also that the different learning orientations are influenced by individual approaches to dealing with the tasks and personal perceptions of the learning context.

In this context, three study orientations have been identified - towards the discovery of meanings; towards the reproduction of knowledge and towards achievements, which, in turn, correspond to the three approaches to learning-in depth, surface and strategic. The orientation towards the discovery of meanings accompanies the in-depth approach to learning. It is well known that when an individual tries to study in depth, he is internally motivated and is highly focused on the understanding of the importance of the learning material. So, he is working on an in-depth and critical awareness of new ideas, drawing on his previous knowledge and educational experience. In addition, individuals who aspire to study in depth, devote enough time for self preparation.

Empirically has been established a functional relationship between the use of a particular approach to learning and self-preparation time [21]. Therefore, we should stress the great importance of the relationship between the holistic and in-depth approach to learning, the increased cognitive interest in educational material and self-preparation, aimed at understanding, awareness, gaining new knowledge and improving the learning skills. Besides the in-depth learning facilitates the development of metacognition, thus resulting in higher motivation for achievement and in internal locus of control on behaviour [22].

The orientation towards the reproduction of knowledge corresponds to a superficial approach to learning, because in such cases the individual relies primarily on mechanical reproduction and utilization of educational information. It turns out, however, that with the

increase in the volume and difficulty of the educational material, the personal anxiety is also increased. In addition, individuals who apply a superficial approach to learning have weaker cognitive interests, lower levels of motivation for achievement and need more efforts in order to pass on to the next level of education. There is also the orientation towards achievement, which corresponds to a strategic approach to learning, and is realized through hard work and targeted achievement of personal objectives and ambitions.

In summary, it can be said that the transition from quantitative to qualitative research of the characteristics of human learning is an essential moment of the development of scientific views on this topic in the field of educational psychology. On the basis of a cumulative empirical data the relevant scientific approaches are outlined with their attempts to explain learning not only from behaviorist, but from cognitive point of view as well. It is obvious that learning cannot be reduced only to specific behavioral responses to different external influences. It is accepted today that learning is based on an active cognitive processing of external stimulation, on the manifestations of such personal mediated factors such as intentions, expectations, self-efficacy, locus of control. Educational psychology today is interested not only in the cognitive and the behavioral aspects of learning, but also in the emotional experiences that are part of the learning process. This is a relatively new and not well enough studied problem area that requires more intense research efforts in the future. Such a research on the emotional aspects of learning is necessary because learning is not only a very complex and multidimensional process, mediated by personality and social factors, but is also simultaneously happening on cognitive, emotional, motivational and behavioural levels. Deep and complex study of all of these aspects will allow for the creation of a whole and multilayered picture of the characteristics of human learning throughout the lifetime.

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