FRAMEWORK FOR DIAGNOSTIC ASSESSMENT OF READING

Edited by
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NEMZETI TANKÖNYVKIADÓ

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Reading is thinking and writing is speech

Mihály Babits

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Introduction

The motto chosen for the volume presenting the frameworks for the diagnostic assessment of reading is a quote from the Hungarian poet Mihály Babits: "Reading is thinking and writing is speech." If we think about the truth of this statement, it will not take long to recognise the self-evident dependence of the course of learning to read and write on these two areas of cognition, and the complexity of the development of the skills of written text comprehension and reading-based knowledge acquisition. It is hardly necessary to argue that the proper development of reading and text comprehension skills cannot be assessed without a thorough understanding of these relationships and of their evolution. While teachers' experiences of reading literacy can help us to obtain a rough estimation of the development of reading skills, there will always remain subjective factors bearing on the accuracy of the estimate.

In our modern world, the methods used by schoolteachers in reading instruction, the teaching of text comprehension and the fostering of knowledge extraction skills should be based on empirical evidence gathered through reliable measurement tools and analysed using well-established methods. Some of the problems related to reading literacy can be resolved by a skilled teacher since only a small proportion of the children underperforming in these areas have special educational needs. Subjective estimations are, however, an inadequate basis for educational activities addressing the roots of the problem since students' level of development and, therefore, the outcomes of an intervention strategy cannot be accurately assessed in the absence of the right measurement tools.

Over the past decade, research efforts have intensified and produced results that – if integrated and transferred into practice – may bring about a major improvement in the efficiency of public education. The programme providing the framework for the present volume occupies the intersection of three major research trends. First, various international surveys have given a great impetus to the development of educational assessment and testing. Second, recent research results in education science and psychology have led to an increasingly refined understanding of the concept of knowledge, which allows more precise definitions of what should be measured at different stages of development. Third, the

availability of info-communication technologies allows measurements to be performed in the way and with the frequency required by public education.

The key to progress in an education system is the availability of efficient feedback mechanisms at the various levels of that system. Such mechanisms can be created through measurements providing objective data on various aspects of performance at each level of the system. These measurements allow us to ascertain whether the education programme is successful in meeting its targets, or whether a given intervention strategy has achieved the desired results. Three main levels of feedback mechanisms have emerged. Large-scale international surveys have become regular events since the turn of the millennium. Hungary participates in international surveys (PISA, TIMSS, PIRLS) that provide data, allowing the performance of the Hungarian education system to be evaluated in the context of other countries' results. The data and the results of their analyses can be used to draw conclusions with regard to ways of introducing system-wide changes improving education efficiency. The results of the recurring cycles of the surveys also provide feedback on the effects of any interventions. The international assessment programmes are designed and implemented with the contribution of the top research and development centres in the world. The various solutions of measurement methodology developed at these centres have also contributed to the development of national assessment systems.

Several countries, including Hungary, have introduced a system of annual assessment covering all students in selected grades of schooling. These surveys provide detailed feedback to individual schools on the performance of their own students and, based on an analysis of the results, schools may improve internal processes and the efficiency of their activities. The results are also made public, which may act as an incentive to seek ways of improvement and development. The experiences of countries where a system of this sort has been in place for a relatively long time show, however, that placing pressure on schools has the effect of improved efficiency only within certain limits. If the stakes associated with the evaluation are too high for either the teachers or the schools, various distortions may result. Further improvement in efficiency can only be achieved by propagating methods and tools directly assisting the work of teachers. These include measurement tools that enable teachers

to obtain a precise assessment of students' level of development in areas of key importance with respect to their further progress.

Traditional paper and pencil tests were, however, very costly and labour-intensive and were therefore unsuitable for performing sufficiently frequent assessments. The second important recent development is thus the explosive advancement of information and communication technologies, which offer novel solutions in every area of life, including educational measurement. Thanks to these technologies, tasks that used to be beyond solution have now become simple to implement in education also. One of these is educational assessment providing frequent diagnostic feedback. Computers were put to the service of education effectively as soon as the first large electronic computers appeared; educational computer software has been around for decades. The use of information technology in education was, however, often motivated by the technology itself, i.e., the reasoning was that now that these tools were available, it made sense to use them in education. The development of online diagnostic assessment approaches the question from the opposite direction: An appropriate technology is sought as a solution to the problem of implementing a task of key significance in education. Paper and pencil tests are unsuitable for frequent and detailed assessments of student progress. From this perspective, info-communication technology is a tool that has no substitute in expanding the range of possibilities for educational assessment.

The third development, one which is closest to the concerns of this volume, is the cognitive revolution in psychology, which affected several areas towards the end of the last century and gave a new impetus to research efforts in connection with school learning and teaching. It has led to the emergence of new and more differentiated conceptions of knowledge allowing a more precise definition of the goals of public education and the development of scientifically based standards and goals. This process has also opened the way to a more detailed characterisation of student development processes.

As the crucial role of early childhood development was recognised, the focus of attention shifted to the first stage of schooling, especially to the encouragement of language development and the fostering of reasoning skills. Several studies have provided evidence that the acquisition of basic skills is indispensable for in-depth understanding of the subject matter taught in schools, which is in turn essential for students to be able

to apply their knowledge in new contexts rather than just reproduce exactly what they have been taught. If the necessary foundations are not constructed, serious difficulties will arise at later stages of study and the failures suffered during the first years of school will delimit students' attitudes towards education for the rest of their lives.

Reading plays a special role in learning in the sense that an adequate level of reading skills can be reasonably regarded as a prerequisite to all further learning. In the absence of confident comprehension of written texts, students cannot penetrate deeper levels of mathematics or follow and process science writings. Poor reading comprehension skills can also hamper performance in tests assessing other knowledge domains, i.e., reading difficulties may distort the validity of test results. It clearly follows from the above considerations that reading must be given special attention in education and, accordingly, special emphasis must be placed on the diagnostic assessment of students' progress in reading and text comprehension.

The developmental processes discussed above have provided the basis for the project entitled Developing Diagnostic Assessment launched by the Centre for Research on Learning and Instruction at the University of Szeged. The project focuses on the development of detailed frameworks for diagnostic assessments in three major domains – reading, mathematics and science – in the first six grades of school. Relying on the frameworks, item banks are developed containing several thousand items and tasks which will be accessible to students on the Internet through an online computer platform. The system – the implementation of which is a lengthy process involving several hierarchically organised steps – will fulfil the function of providing frequent individual student-level feedback on changes in various dimensions of knowledge.

The diagnostic tests are primarily designed to assess individual students' progress relative to various reference points. Similarly to system-wide surveys, the programme allows the population means to act as natural standards of comparison: Being able to compare an individual's performance to the performance of their peers can provide important information. The diagnostic tests should, however, go beyond that: They should follow student progress over time, i.e., compare an individual student's performance at a given point in time with the results of previous measurements.

The tools of measurement are based on content frameworks resting on scientific foundations, which are outlined in three volumes of parallel structure. The present volume discusses the outcomes of our work on the domain of reading while the two companion volumes contain the results of our work in the domains of mathematics and science. The development work for the three domains proceeded in parallel and the same broad theoretical framework and conceptual system were used for the development of the detailed contents of their assessment. Besides having an identical structure, the three volumes also contain some identical sections in their Introduction and in Chapter 4.

The work reported in this volume draws on the experiences of several decades of research on educational assessment at the University of Szeged and on the achievements of the University of Szeged and Hungarian Academy of Sciences' Research Group on the Development of Competencies, with special reference (a) to the results of studies related to the structure and organisation of knowledge, educational evaluation, measurement theory, conceptual development, the development of reasoning skills, problem-solving and the assessment of school readiness, and (b) to the technologies developed for test item writing and test development. The construction of theoretical foundations for diagnostic assessments is, however, a complex task requiring extensive collaborative effort in the scientific community. Accordingly, the development of the frameworks has been a local and international co-operative enterprise involving researchers in the fields that are to be assessed. The opening theoretical chapters of each volume have been prepared with the contribution of a prominent specialist in the relevant field; thus our work rests upon scientific knowledge on the cutting edge of international research. The details of the frameworks have been developed by researchers and teachers and other professionals with practical experience in curriculum development and test construction.

The frameworks are based on a three-dimensional conception of knowledge in line with a tradition characterising the entire history of organized education. The wish to educate the intellect, to cultivate thinking and general cognitive abilities is an ambition that dates back to the beginnings of organised education. Modern public education also sets several goals applying to the learners themselves as individuals. In order to attain these objectives we must first of all be guided by the achieve-

ments of scientific fields concerned with the human being and the developing child. The precise definition of these goals and the selection of the contents of assessment can draw on the results of developmental psychology, the psychology of learning and, more recently, on the achievements of cognitive neuroscience.

Another area of educational goals is related to the usability of school knowledge: The dictum "Non scholae sed vitae discimus." is perhaps more topical today than ever before, since our modern social environment is changing far too rapidly for public education to be able to keep pace with it. It is therefore essential that the question of the application of knowledge should appear as an independent dimension in the frameworks of diagnostic assessments. This constitutes a different system of goals, for which we must define what the school is expected to do to enable students to comprehend the texts they encounter during their studies and in various situations in their everyday lives. The role of reading is very different now from what it used to be, as the processing of different types of text is now part of daily life. It is no longer sufficient to teach students to read literature and other types of continuous prose; they must also be able to efficiently process, critically evaluate and use information represented in various forms, such as texts, diagrams and tables. In addition to linearly arranged texts printed on paper, students also need to be able to extract as much information as possible from electronic sources of information.

The third important issue is the question of which elements of the knowledge accumulated by the sciences and the arts should be selected as contents to be imparted at school. It is important not only because the above objectives cannot be attained without content knowledge but also because it is an important goal in its own right that students should become familiar with a given domain of culture, the knowledge generated by mathematics and science and organized according to the internal values of a given discipline. The school system organises the attainable knowledge into a curriculum and a syllabus, and teaching always proceeds via the study of specific contents. While the contents of teaching may serve distant goals reaching beyond the texts themselves, it is far from being immaterial what texts – what contents – are used to develop the skill of meaningful reading.

The above goals have been competing with each other over the past few decades with one or another coming into fashion at different times.

For the purposes of the present project we assume that education integrates the three main goals in fulfilling its function but that diagnostic assessments must differentiate among them. Diagnostic assessments must be able to show if there is insufficient progress in one or another of these dimensions.

The first three chapters of this volume summarise the theoretical background and research evidence related to the three dimensions mentioned above. In Chapter 1, Leo Blomert and Valéria Csépe discuss the psychological aspects of the issues in the teaching and assessment of reading literacy. An overview of research in cognitive neuroscience bearing on teaching and assessment is given and the latest results of interdisciplinary research on reading are analysed. Chapter 2 by Wolfgang Schnotz and Edit Katalin Molnár looks at the issue of application focusing on external requirements related to reading skills. The significance of this consideration has previously been highlighted by the PISA surveys and it has also become one of the most emphatic questions of the various Hungarian reading assessment programmes. In Chapter 3, Krisztián Józsa and János Steklács discuss the contents and curricular targets of the instruction and learning of reading skills and draw some conclusions with reference to assessments. All three chapters draw on a rich body of literature and the detailed bibliographies including up-to-date references at the time of compiling can assist future development work. Chapter 4 by Benő Csapó, Krisztián Józsa, János Steklács, Ágnes Hódi and Csaba Csíkos addresses theoretical issues in the development of frameworks, describes the special needs of diagnostic assessments and draws some conclusions pertinent to the detailed frameworks presented in the following chapter and to the practical component of the work.

Chapter 5, the longest chapter of the volume, contains the detailed frameworks of diagnostic assessment. The purpose of this chapter is to define the contents of measurement and to provide a basis for the development of measurement tools and test questions. For the purposes of diagnostic assessment, the first six grades of schooling are considered to constitute a continuous education process. The results of the assessments therefore place students according to their current level of development along uniform scales spanning all six grades. The content specifications of assessment questions could also essentially form a single continuous unit. However, in an effort to allow greater transparency and to follow

the traditions of educational standards, this process has been divided into three stages, each of which covers approximately two years. For the three dimensions, therefore, nine content blocks are described altogether.

In their present state, the frameworks detailed in this volume should be seen as the first step in a long-term development process. We have defined the direction that appears to be the best to take given the present state of our knowledge. As the domains covered develop at a very rapid rate, however, the latest findings of science should be incorporated from time to time. The content specifications can be constantly updated on the basis of our experiences of item bank development and an analysis of the data provided by the diagnostic programme in the future. Our theoretical models can also be revised in the light of empirical evidence through an evaluation of the test questions and an analysis of relationships emerging from the data. In a few years' time we will be in a position to look at the relationship between the various areas of early development and later performance.

We are indebted to so many of our colleagues for sharing their professional contributions and expertise in this volume. We owe a special acknowledgement to Krisztián Józsa, János Steklács, Ágnes Hódi and Csaba Csíkos for their valuable work in completing the detailed framework. Besides the authors of the chapters, several colleagues have assisted in the work and their contribution is gratefully acknowledged. Special thanks are due to the team responsible for the organisation and management of the project: Katalin Molnár, Judit Kléner and Diána Túri. The development and final presentation of the contents of the volume have benefited greatly from the comments of our reviewers. We would like to take this opportunity to thank Zsuzsanna Horváth, Marianne Nikolov and Dénes Tóth for their valuable comments and constructive suggestions.

Benő Csapó and *Valéria Csépe*