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Learning disabilities in international discourse

Conceptual dichotomies between the DSM-5-TR and BNO11 in practice delineation

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Abstract
An examination of the conceptual definition of learning disabilities may be fundamental for interpreting the results of diagnostic procedures. The Diagnostic and Statistical Manual of Mental Disorders of the American Psychiatric Association (APA) and the International Classification of Diseases 11th Revision published by the World Health Organization (WHO) delineate a common diagnostic cluster system that enables multidisciplinary communication between different disciplines by providing a common professional language, vocabulary, and interoperability of systems. Several problems, including learning, are not only relevant to the field of education, but may also be relevant from a medical science perspective. Given the new discourse in the field of special needs education, such as the holistic approach, this is a fundamental requirement. This is not only relevant for a more effective diagnosis of learning disabilities but also for inclusion without an interdisciplinary discourse in which conceptual boundaries are not meaningful for different disciplines. The implementation of research findings in international discourse can also be successful if the findings are interpretable not only across disciplines, but also across national borders. Using secondary source analysis and desk research, we analysed the conceptual definitions of ICD and APA from the perspective of learning disabilities. Our results highlight fundamental correlations that may justify a reinterpretation of the way diagnostic results are used in comparison with previous versions of diagnostic systems. This may foreshadow the need to adapt the diagnostic system and improve the process in case it has not yet adapted the latest scientific findings and diagnostic clusters. In our view, the introduction of new diagnostic principles and clustering methodologies could be an argument for revising the structure and functioning of previous systems.
Keywords: APA; ICD11; learning disorder; special educational needs; diagnostics; DSM-5
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Introduction

The care and diagnosis of children with learning disabilities is a relevant issue for all European countries according to relevant statistics. In addition, adequate access to education for children with learning disabilities is a registered objective in the EU Disability Strategy 2021-2027 as a set of common principles for inclusion. Thus, the conceptual definition of learning disabilities and the interpretation of the diagnostic tools and results of the measurements may also justify a certain degree of transparency, since without a uniform definition of the group with learning disabilities, a uniform interpretation would be meaningless.

The available diagnostic systems, such as the APA or ICD, may be an appropriate alternative if implemented with due care by the EU. Although not preceded by a broad professional consensus, non-representative research suggests that several countries have automatically adopted and applied the diagnostic principles of ICD and/or APA in learning disability diagnosis. This makes interpretation even more urgent and may justify further research and interpretation as a diagnostic manual adapted to the specificities of another country may not be automatically adaptable to the educational system of a country. In our secondary source analysis, we would like to focus on this, on the relevant conclusions that the APA and ICD systems draw about learning disability and where and how these can overlap from the perspective of educational practice.

Our research question is also related to this, that is, whether the DSM-5-TR and ICD11 can be used to adequately distinguish the diagnostic concept of learning disability. Our hypothesis is that the disconnection of learning disorders from neurological disorders and organic backgrounds has been achieved. Thus, psychiatric-medical definitions can be applied to the field of educational science.

Conceptual background

Learning disabilities have conceptual dichotomies (Pennington et. al. 2020), that is, there are multiple interpretations of a single definition, even within a single system, regardless of the linguistic domain (Fejes and Szenci 2010). This is despite the fact that it was earlier suggested by researchers that a given manifestation of learning disabilities can be interpreted as a continuum (Pelej 1975). Learning disabilities can be interpreted as a set of different focal interpretations of symptoms, rather than as a single concept. Three major paradigms can be used to define learning disabilities (Fletcher 2012). Attempts at theory building were made as early as 1970. One of these earlier approaches was the cognitive discrepancy model (Taylor et. al., 2017), which suggests a discrepancy, that is, a mismatch between the level of cognitive functioning and the educational performance shown may indicate a learning disability. However, the overemphasis of cognitive functioning on academic performance may be problematic in several respects, as it does not explain the existence of a proximal developmental zone (Farid and Ghaemi, 2017). In case of this approach, other authors (Cohen 1983) acknowledge that although

learning disability can be seen as a continuum, the educational system cannot address it and calls for categorization. This further strengthens the relevance of our source analysis, as a review of DSM and ICD categories from a practical focus can be fitted to this proposition.

Another paradigm behind the delineation of learning disabilities is the identification of learning disabilities along the lines of poor educational performance (Fletcher 2012). However, this theory also has problems supporting categorization with measurement. Indeed, cognitive deficits or surpluses do not necessarily or automatically refer to educational performance. Another problem is that learning difficulties are directly and invariably linked to specific brain areas. Indeed, low educational performance may have a nonneural basis. The validity and error rates of psychometric measures in borderline areas may raise further ethical and methodological questions and push the professionally principled categories of care focus towards severity-centred, entitlement-based diagnostics, which in fact remove diagnostic findings from the practical discourse, as they focus not on outlining development but on determining eligibility. Thus, they may provide less support for teachers in their everyday practice, as their competence is limited in determining their eligibility for care. This is the problem currently faced by the Hungarian diagnostic and care system (Vida, 2023), as it is the eligibility for care that is actually determined; yet, teachers in institutions need guidance in determining the content of care.

The third paradigm in special education (Fletcher et al. 2011; Nelson et al. 2003; Vellutino et al. 2006) is based on care groups rather than diagnostic categories. This approach attempts to combine cognitive, neuropsychological findings and research related to educational performance. It tries to unify the patterns revealed by brain imaging studies as a predictive factor in the emergence of learning disabilities (Rezaie et al. 2011). It does this by projecting a specific manifestation of cognitive profiles, specific to the problem at hand, onto the decline in school performance (Fletcher et al., 2011; Vellutino et al. 2006). However, it does not resolve conceptual dichotomies. Instead of a diagnostic category, it actually introduces a category of care, but does not offer an alternative for the implementation of diagnostic results in the content of the scope of remedial activities, leaving the development practitioner to interpret the diagnosis.

To summarize the conceptual delineation, cognitive functioning and school performance problems are the determinants behind learning disability, but they also introduce a degree of uncertainty into the diagnostic process that can make diagnosis-based grouping difficult. It also highlights another, more far-reaching problem, namely the issue of neurological involvement.

The Hungarian diagnostic system for learning disability has been mentioned earlier and is relevant because it has for a long time treated learning disability as a neurological disorder, although it has not been associated with any medical imaging procedure. The fact that between 1993 and 2011 the Hungarian diagnostic system treated learning disability as a neurological problem cluster due to organic causes without brain imaging procedures (Vida 2022) is itself questionable. Since then, it is known and scientifically proven that brain imaging is not relevant for learning dis-

ability (Fletcher 2012). In addition, it is also known that although the study of brain activity and structure can help to understand the morphological and functional neuroscience of learning, it has no concrete implications for the design of educational intervention (Goswami 2008). This is easy to see, since educational tests can be used to make valid findings in the field of educational science and the state of the nervous system can only be inferred through many indirect steps. The converse may also be true, since the learning process cannot be independent of the morphology and function of the nervous system, and the complexity of the function that is created presumably makes it difficult to draw simple conclusions. This may be suggested by the previously cited proximal developmental zone (Farid and Ghaemi 2017), which, in a given framework, demonstrates the possibility of learning performance that exceeds cognitive function. Although without further research, we can only assume the importance of neuroplasticity behind all this (Battro et. al. 2011; Swaab 2017; Dezső 2022), since in the case of a given extent and quality of damage to the nervous system, other areas may take over the functions, which may also suggest, by implication, that learning disability can be interpreted as a process of cooperation between areas with a radically different composition from the usual learning pathways and methodological strategies used. In this theoretical case, the disorder is not in fact a dysfunction, but a learning process so different from the methodology that it already represents a discrepancy and, in some cases, an unintelligible or unmeasurable performance within the framework of formalised education. The DSM-5 and ICD 11 category system may offer a partial solution to this, and this was the focus of our secondary source analysis.

Research Methodology

The resources available to us have justified the use of desk or secondary research to investigate the issues raised by analysing pre-existing sources and data to answer the research questions. This is not an unfamiliar method in the field of special education (Conderman and Katsiyannis 2002). In our research, we investigated the knowledge and definitions related to the diagnostic criteria of specific learning disabilities in the DSM-5-TR and an international classification system of BNO-11 compiled by the WHO.

Our secondary research was carried out in the following steps, which fit the methodology and steps of desk research (Moore 2006):

- *Data collection:*

The source of the data and our sample is the International Classification of Diseases 11th Revision, currently in force, so it is available online on the World Health Organization (WHO) website, in full and without restriction. Website: https://icd.who.int/en.

Our other source is the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, (DSM-5), available on the American Psychological Association (APA) website: https://dsm.psychiatryonline.org/

• *Analysis of sources:*

In our research, we conducted a comprehensive analysis of learning disability definitions, examined their relevance and reliability, and searched for relevant information to answer our research question.

• *Synthesis:*

Based on the data collected and analysed, it has become clear how the definition and concept of learning disability can be effectively exploited in the context of special education diagnosis.

• *Evaluation:*

Given the conceptual delineation and methodology used, the extent to which our conclusions can be extended is limited, and further research may be required to apply the results with confidence, but we have managed to focus attention on the difficulties of automatic adoption of DSM-5-TR and/or ICD11. This should be established through wider professional consensus, education, etc.

Sample

Given that both diagnostic manuals are available in full, only content relevant to the research focus is summarized and presented. This set of criteria is used to delineate how the two diagnostic systems allow the identification of learning disabilities from the data.

DSM-5-TR

The DSM-5 describes learning disabilities as a neurodevelopmental disorder with the specific feature of impeding the acquisition of learning skills relevant to school learning (e.g., reading, writing, or arithmetic) and, through this, their active and effective use in complex learning processes. Given that learning is a complex process and that such aspects may occur at an adult or adult age, development is continuous and may be based on myriad factors. For this reason, according to the DSM-V nomenclature and basic definitions, signs of learning disability may appear as early as preschool (e.g., difficulties in learning the names of letters or counting objects) but can only be reliably diagnosed after the start of formal education, since reading disorders may manifest during the learning process.

The DSM-V, therefore, raises the possibility that the learning disability identified by teachers in the educational system and systems that provide assessment may differ from the DSM-V (Tannock 2014).

The term used is "specific learning disability," the diagnostic criteria for which can be divided into two broad groups. The first group consists of problems that define the specific nature of learning disability, that is, the area in which the disability occurs. These include reading, writing, and mathematics. The other is the set of problems that can be formulated in general terms but have a global impact on learning.

The DSM-5-TR rejects the cognitive discrepancy model and therefore gives special weight to the constellation of problems. Thus, the overall nature of the problems is emphasized over cognitive dysfunction, a major departure from the deficit-oriented paradigm of low cognitive ability as a consequence of poor academic performance.

The DSM system divides the criteria into groups A, B, C, D, and E, one of which must be met in each of the areas mentioned above and after six months of active intervention, which will be discussed later in the summary of the DSM-BNO and the national model (DSM-5-TR, 2013):

"A" criteria:

- Inaccurate or slow and laboured word reading (e.g., reading some words aloud incorrectly or slowly and hesitantly, often guessing words, and difficulty pronouncing words).
- Difficulty in understanding the meaning of the text read (e.g., reading the text accurately but not understanding the order, context, inferences, or deeper meaning of the text).
- Difficulties with spelling (e.g., adding, dropping, or substituting vowels or consonants).
- Difficulties with written expressions (e.g., making several grammatical or punctuation errors within sentences, poorly organizing introductions, not expressing ideas clearly enough in writing).
- Difficulties in learning number sense, number facts, or arithmetic (e.g., poor understanding of numbers, their magnitude, and relationships; counting single-digit numbers with fingers instead of recalling the mathematical fact as peers do; getting lost during arithmetic calculations and possibly switching to a different procedure).
- Difficulties in mathematical reasoning (e.g., serious difficulties in using mathematical concepts, facts, or procedures to solve quantitative problems).

"B" criteria:

- The learning skills involved are significantly and quantifiably below the expectations of the individual's chronological age and cause significant impairments in academic or vocational performance or activities of daily living, as confirmed by individualized standardized performance measures and comprehensive clinical assessment.
- For individuals aged 17 years and over, standardized assessments can be replaced by a documented history of learning difficulties.

"C" criteria:

- Learning difficulties generally start at school age but may only become fully apparent when the demands on the learning skills involved exceed the individual's educational dysfunctional abilities (e.g., timed tests, reading or writing long, complex reports on tight deadlines, excessive study load).

“D” criteria:

Learning difficulties are not better explained by intellectual disability, uncorrected visual or auditory acuity, other mental or neurological disorders, psychosocial disadvantages, lack of language in formal education, or inappropriate educational methodology.

A relevant element of the DSM-5-TR is that the assessment of a specific learning disability can only begin after six months of failure of targeted help and excludes the possibility of attaching it to a social disadvantage. Thus, it takes a process and development-oriented perspective.

ICD 11

ICD 11 provides the following definition of “developmental learning disability”: “Developmental learning disability is characterized by significant and persistent difficulties in the acquisition of academic skills, which may include reading, writing or arithmetic. An individual’s performance in the affected academic skill(s) is significantly below what would be expected in years, based on biological age and general level of intellectual functioning, and results in significant impairment in the individual’s academic or other functioning. Developmental learning disabilities first appear when learning skills begin to develop in lower school. A developmental learning disability is not the result of impaired intellectual development, sensory impairment (visual or auditory), neurological or motor disorder, lack of access to education, lack of knowledge of the language of academic instruction, or psychosocial disadvantage (ICD11, 2023).”

Diagnostic criteria for developmental learning disability based on the ICD11:

- The presence of significant barriers to the acquisition of reading, writing, or numeracy skills, resulting in a significantly lower level of proficiency than age-appropriate. Barriers to learning also exist in the areas concerned in the face of inadequate instruction. These barriers may be limited to a single component of a particular skill (e.g., the inability to acquire basic numeracy skills or decode certain words accurately and fluently) or may affect the whole range of literacy and numeracy performance. Ideally, the degree of disability can be measured using standardized tests.
- The onset of limiting factors typically occurs in early school years but may not appear until later in life, even in adulthood, when the demands of learning performance exceed the level of limited ability.
- The barriers are not due to external factors, such as economic or environmental disadvantages or lack of access to educational opportunities.
- Learning difficulties are not better explained by intellectual disability; other neurodevelopmental disorders; or other conditions such as motor, visual, or auditory sensory disorders.

Based on ICD11, the code given in the application of diagnostic assessment can only be used to indicate severely impaired academic skills at the time of assessment, referring to the specificity of the problem area. In the case of multiple-skill impairments, multiple codes can be used, which is a significant departure from the previous use of summary grouping.

According to the ICD11 description in English, developmental learning disabilities may also be associated with neurodevelopmental disorders such as attention deficit hyperactivity disorder, developmental motor coordination disorder, developmental language disorder, and autism spectrum disorder. In addition, a person with a developmental learning disability may have marked difficulties in self-regulating attention, which is not severe enough to warrant a separate diagnosis; therefore, ICD11 does not use a separate categorization system. Persistent difficulties in self-regulating attention may also adversely affect academic performance and hinder the effectiveness of habilitation and rehabilitation sessions.

Some individuals with developmental learning disabilities can maintain adequate levels of key learning skills through compensatory strategies, with exceptionally high levels of effort or time, or with unusually high levels of support. However, as the demands on the effectiveness of key learning skills increase and exceed ability (e.g., taking tests under time pressure, reading or writing long, detailed, data-rich texts also under time pressure, and more complex academic work such as in secondary school, higher education, or vocational training), underlying learning difficulties may surface. The situation of young people with special educational needs in higher education is complicated in several ways (Szabóné 2023).

Ideally, the identification of the presence of a developmental learning disability could include the assessment of academic performance using standardized instruments. However, a child's score on a single test measuring a particular academic skill is insufficient to distinguish the disorder from the norm.

Performance scores can vary owing to the technical properties of the test used, the testing conditions, and a number of other variables, and can also vary significantly over the course of an individual's development and life course. Therefore, when making a diagnosis of a developmental learning disability, it is necessary to consider various pieces of evidence about a child's learning ability outside of the formal testing situation.

Learning disabilities typically persist through adolescence and adulthood. These deficits can negatively affect a child's school performance, increase the likelihood of dropping out of school and contribute to unemployment (or 'under-schooling') in adulthood, especially if no improvement is made. In addition to school dropouts, major depressive symptoms also increase the risk of poor mental health, including suicide.

The specific impairments associated with a developmental learning disability vary depending on the developmental stage and learning abilities, severity of the deficits, complexity of the tasks, presence of associated mental, behavioural, or neurodevelopmental disorders, and availability of support. Developmental learning disabilities are also associated with an increased risk of suicidal ideation and suicide attempts over their life course.

Some of the results of our research overlap with the ICD11 categorization system, but overall it does not seem to be suitable for an adequate application of this criteria system in the domestic diagnostic process, and we therefore consider the mechanical application of ICD11 codes to be unacceptable, not only because of the harmful stigmatizing effect of 'labelling,' but also because the reasoning and procedures behind the ICD11 categorization system are not fully met. Thus, delimitation cannot be sufficiently efficient because the category assignment must also match the steps of background variable identification.

The ICD code system classifies learning disorders under the heading of "*mental, behavioral, or neurodevelopmental disorders,*" major group 6, and further narrows the category with the definition of "*developmental learning disorder,*" code 6A03. This fits in with the national legal context, which defines learning disorder as "*other mental disorders* ". However, this coding also defines what is not considered a developmental learning disorder, which is linked to the MB4B "*symbolic dysfunction*" group, i.e. "*signal processing dysfunction*" in the diagnostic system:

- dyslexia - alexia (MB4B.0) reading-related problems, which, in the case of alexia, include a complete inability to read.
- agnosia (MB4B.1) A problem primarily due to damage to sensory organs, such as blindness or deafness, that is, 'loss' or severe impairment of the sensory processing channel associated with damage to the sensory organs.
- akalculia (MB4B.2) total inability to perform arithmetic, that is, the inability to perform arithmetic, even in the most elementary arithmetic operations.
- agraphy (MB4B.3) total inability to produce literacy, i.e. total 'illiteracy'.
- anomia (MB4B.4) (or anomic aphasia) anomic aphasia is a milder form of aphasia in which the individual may have difficulties with word-finding or naming objects. In anomic aphasia, although speech is typically fluent, it may still be difficult to produce certain words, particularly nouns and verbs.
- dyscalculia (MB4B.5) severe impediments or disturbances in the numeracy performance.
- Other specific symbolic functions (MB4B.Y)
- Symbolic functions of unknown origin (MB4B.Z)

Subgroups of Learning Disabilities and Their Delimitations

Based on ICD11, the code given in the application of diagnostic assessment can only be used to indicate severely impaired learning skills at the time of assessment, referring to the specificity of a given problem area. In the case of multiple skill impairments, a multidisciplinary designation may be used, which is a significant departure from the previous designation, where a summary grouping was used (e.g., mixed school skills disorder, BNO10: F81.3).

- 6A03.0 Reading disorder
  This is defined as a learning disability that manifests as impairments in reading skills, such as word reading accuracy, reading fluency, and comprehension, but does not reach the level of dyslexia or alexia.

- 6A03.1 Impairment of written expression
  Here the learning difficulties are manifested in writing skills such as accuracy of spelling, grammar and punctuation, organisation and cohesion of written ideas, but do not reach the level of dysgraphia or agraphia
- 6A03.2 Mathematical disorders
  Learning difficulties are manifested by impairments in mathematical skills, such as number sense, number memorization, accurate counting, smooth calculation, and accurate mathematical reasoning (but not yet dyscalculia or acalculia).
- 6A03.3 Other specified learning disorders
  Learning disabilities are manifested by impairments in the learning and performance of specific academic skills that are not adequately described by any of the other available specifications.
- 6A03.Z Developmental learning disorder, unspecified
  The cause is not known.

Results

Learning disability is referred to as a "Specific Learning Disorder" in the DSM-5-TR, which provides a detailed analysis of the diagnostic criteria for defining a specific learning disorder as a persistent and significant problem that can affect an individual's abilities in multiple domains.

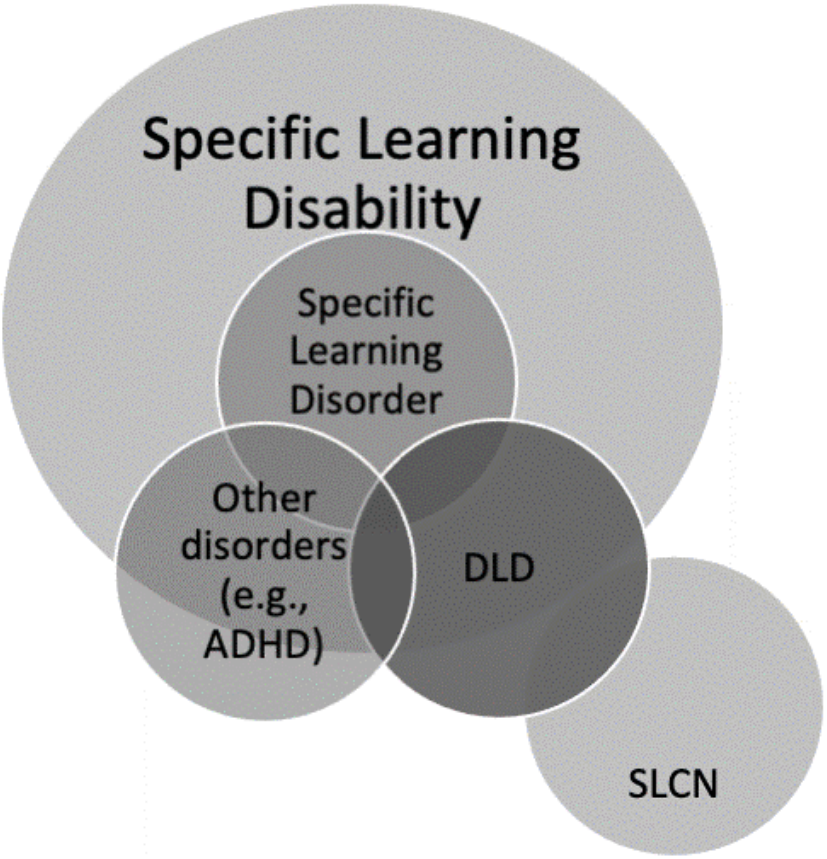
The diagnostic criteria include substantial difficulties in learning performance, which can be distinguished from problems of general intelligence or lack of quality of education, and cannot overlap with social disadvantage. It does not exclude the possibility that learning disabilities may also be present in individuals aged 17 years or older, in which case a documented history of learning difficulties may be substituted for a standardized assessment.

ICD 11 has a very similar focus on exclusionary factors but is more flexible than the DSM-5TR in that it does not exclude the possibility that a learning disability may present later in life, in adulthood, when the learning needs exceed the level of limited abilities. In summary, BNO 11 suggests that limitations are not due to external factors, such as economic or environmental disadvantage or lack of access to educational opportunities, and BNO 11 also excludes the possibility that learning disabilities are caused by intellectual disability or other neurodevelopmental disorders, or other conditions such as motor disorders and visual or auditory sensory impairments.

However, it emphasizes that learning difficulties can result in significant damage to an individual's academic, occupational, and other important areas of functioning. If functional ability is maintained, a significant effort is required.

Figure 1: self-made diagram of the ICD 11 categories

Figure 2: Archibald, 2017; DSM-V, 2013



Conclusion

Our research question is also related to this, that is, whether the DSM-5-TR and ICD11 systems are suitable for an adequate differentiation of the diagnostic concept of learning disability. We believe that the answer is possible, since differential diagnosis can be made on the basis of the criteria within European Union countries, adapted to the medical pedagogical diagnostic system of national educational systems.

Our hypothesis is that the separation of learning disorders from neurological disorders and organic background has been achieved on the basis of the BNO and DSM, since BNO 11 has moved the total loss of function and neurological injury into a separate diagnostic group so that specific learning disorders are not confused with specific neurological status and injury. This can be argued, as learning problems in neurological injury can be described as a co-occurring symptom, and the current state of science is that brain injury is irreversible, so the pedagogical

focus can be on compensation. Thus, psychiatric medical definitions have become applicable in the field of education. This removes the burden of the educational diagnostician to diagnose neurological injury without adequate imaging or brain activity measures.

In the case of the DSM-5-TR, we find a similar confirmation of the questions we have raised, since the phenomena of cognitive abilities and learning disabilities have also been separated. The ordered set of criteria is suitable for differential diagnosis to be carried out appropriately by any educational system, adapted to its own national characteristics. The DSM-5 provides detailed diagnostic criteria for specific learning disorders (SLD) in all learning domains. This can be a relevant aid in establishing a care-oriented system for diagnosis in special education.

ICD11 is a generic classification system, and its international acceptance is reinforced by the fact that it was created by the WHO and is therefore widely used in health and education systems. The previous version is also widely used; therefore, there is no reason why it should not be continued. An important aspect of differential diagnosis is that both DSM-5-TR and ICD11 can help avoid the proliferation of misdiagnoses, even if they cannot prevent it by themselves, as they impose a more restrictive conceptual framework for the interpretation of results.

Overall, both the DSM-5 and ICD11 are important tools for identifying learning disabilities and outlining therapeutic developments. The combination of detailed diagnostic criteria and general classification allows professionals to make accurate diagnoses and apply appropriate treatment strategies. By clarifying the uncertainty of the organic background and neurological injuries, implementation is expected to become easier.

Based on secondary source analysis, the assessment and diagnostic results are consistent with both the DSM and ICD11 systems and are likely to be well applied. However, the terminology and criteria used in the BNO and DSM are still unclear as to how a decision should be made on the basis of a given measurement. There are exclusionary factors, such as the social disadvantage mentioned earlier. All this conceptual framework is in fact a map of a given area that can be perceived as a unit. In diagnostics, we are guided by our measurement results, criteria, and concepts, directing us to where we arrive. Not specific instructions, but guidelines.

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Megjegyzés

A tanulmány elkészítéséhez nem kaptunk pénzügyi támogatást. A kutatáshoz szakmai segítséget a Pécsi Tudományegyetem Bölcsészet és Társadalomtudományi Kar Kvalitatív- és Kevert Eljárások Módszertani Kutatócsoportja biztosított.

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