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INDIVIDUALISED INSTRUCTION AND SUPPORT STRATEGIES IN DEVELOPING SCIENTIFIC COMPETENCE IN FIFTH-GRADE STUDENTS WITH DYSLEXIA

Abstract

Developing scientific competence—which includes understanding concepts, scientific thinking, and problem-solving—is essential for all students, including those with dyslexia. To enable them to successfully achieve curriculum outcomes, targeted support strategies are applied in teaching. The aim of this research was to examine how the application of the same basic support strategies, individualised through ongoing teacher reflection, influences the development of knowledge and scientific skills in students with dyslexia. The study included four students with varying degrees of dyslexia. Three written assessments were conducted, and the results were analysed intra-individually (tracking each student's scientific competence development over the year) and inter-individually (comparing students' knowledge and skills to assess how the degree of dyslexia and corresponding adaptations of support strategies affect success in different types of tasks). Descriptive statistical analysis was applied, with the results presented graphically. The results show that all students, despite varying degrees of dyslexia, developed a certain level of scientific competence when individualised support strategies were applied. Students with milder difficulties were more successful and consistent, while those with more pronounced difficulties showed greater fluctuations and required more intensive support. Systematic and reflective implementation of support strategies can enable students with dyslexia to make progress in knowledge and skills, tailored to their individual needs and the Science curriculum.

Keywords: students with learning difficulties; inclusive education; scientific literacy; reflective practice

Introduction

As early as 1948, the United Nations recognised the right to education as a fundamental human right. In addition to the Universal Declaration of Human Rights, this right and its protection are also addressed in the United Nations Convention on the Rights of the Child, the United Nations Convention on the Rights of Persons with Disabilities, as well as numerous national documents. In Croatia, the right to education is addressed in the *Strategy for Education, Science and Technology*, the *Act on Education in Primary and Secondary Schools*, the *Guidelines for Working with Students*, various education-related regulations, and many curricular documents (Ministry of Science and Education, 2021: 128). With the development of pedagogical sciences, the focus has expanded from the right to education to the right to inclusive education. Inclusive education is based on the right of all students to quality education. It enables students with difficulties to participate and collaborate with their peers during the educational process, in accordance with their abilities, possibilities, and interests (Stančić et al., 2023: 72). In their work, Igrić et al. (2018: 19) state that the profile of inclusive education professionals is based on four areas of competence: valuing student diversity, providing support to all students, collaboration with others, and continuous professional development.

According to the *Act on Education in Primary and Secondary Schools* (*Official Gazette* 87/08, 86/09, 92/10, 105/10, 90/11, 5/12, 16/12, 86/12, 126/12, 94/13, 152/14, 07/17, 68/18, 98/19, 64/20), students with special educational needs include gifted students and students with learning difficulties. These students represent a diverse and heterogeneous group with various, multiple, and changing needs. While some students require continuous additional educational support in all or specific areas, others need only temporary and limited support (Ministry of Science and Education, 2021: 128).

Article 65 of the same Act defines students with difficulties as:

- students with developmental disabilities,
- students with learning difficulties, behavioural and emotional problems,
- students facing difficulties due to educational, social, economic, cultural, or linguistic factors (Ministry of Science and Education, 2024: 32).

Dyslexia is categorised as a specific learning difficulty. Its main features are problems with reading and writing, which can be seen in decoding issues (i.e., reading speed and accuracy), as well as comprehension challenges. According to Croatian laws and regulations, students with dyslexia are typically educated within the regular curriculum using an individualised approach, which includes methodological adjustments but does not involve curricular content

modifications (Stančić et al., 2023: 72). Methodological adjustments refer to teaching methods aimed at reducing or eliminating barriers associated with a specific difficulty (Kuvač Kraljević & Peretić, 2015: 113–126).

For students with dyslexia, adaptations can be divided into two main components: adaptations in teaching and learning, and adaptations in assessment. Adaptations in teaching and learning include both graphical and linguistic adjustments, with a combination of the two proving most effective (Stančić et al., 2023: 72). These two components are also essential when using "plain language." The goal of plain language is to make texts readable and understandable by modifying or translating materials, or by creating new materials that follow linguistic and graphical design principles (Lindholm & Vanhatalo, 2021: 660). Linguistic adaptations include dividing content into smaller sections, using subheadings, bullet points, and other formatting elements to separate information, highlighting key concepts (e.g., using bold text), explaining new or unfamiliar terms, using clear and precise vocabulary (especially in questions and instructions), and employing short, simple sentences (Stančić et al., 2023: 72).

Graphical adaptations involve widening margins, using at least 1.5 line spacing, left-aligning text, indenting new paragraphs, separating sentences with double spacing, starting new sentences on new lines where possible, choosing an appropriate font size and style (minimum size 12, ideally 14, without unnecessary strokes or embellishments), avoiding underlining or italics, and printing on matte cream-colored paper. Fonts should be simple, visually clear, and dyslexia-friendly. To clarify abstract information, visual support such as illustrations, photographs, tables, graphs, and infographics is highly beneficial. These visual aids must be relevant to the text and serve to provide additional information, summarise content, and/or enhance comprehension (Jozipović, Lenček & Kuvač Kraljević, 2022: 252–275).

In terms of assessment adaptations, the literature frequently mentions extending the time available for task completion or written evaluations (Ivančić, 2010: 127; Stančić et al., 2023: 72). However, time alone is not a key factor if the task text is not linguistically and graphically adapted for students with dyslexia.

In Croatia, the subject *Science (Priroda)* is taught in the 5th and 6th grades of primary school. It conceptually builds upon the knowledge, skills, and attitudes acquired in *Science and Social Studies (Priroda i društvo)*, and serves as a transitional subject toward the disciplines of Biology, Physics, and Chemistry. Learning outcomes are organised into four macro-concepts: *Organisation of Nature*, *Processes and Interactions*, *Energy*, and *Scientific Approach*. These

concepts are interrelated and ensure a better understanding of students' environment and the fundamental principles of natural sciences. They are taught primarily through observation and experimentation—i.e., through a scientific approach that fosters the development of scientific competence (Ministry of Science and Education, 2019a: 13).

Scientific competence includes the ability to scientifically explain phenomena, evaluate and design scientific investigations, and interpret scientific data and evidence (Markočić Dekanić et al., 2019: 268). It is one of the eight key competences for lifelong learning defined by the European Commission and is intended to be acquired during formal education and further developed throughout life. This competence is fostered through learning outcomes in *Science and Social Studies*, *Science*, and *Biology*, supporting the structured development of scientific literacy from an early age (Ministry of Science and Education, 2019b: 33). Teaching that promotes scientific literacy requires active, inquiry-based learning, problem-solving, and collaborative learning, while maintaining an interdisciplinary approach (Idsardi, 2020: 13–25). Presenting information in multiple formats can enhance learning and knowledge transfer, which is particularly important in inclusive education (Menendez et al., 2024: 307–330).

The *Science* curriculum recommends an investigative approach that uses real-world phenomena and visual aids to better achieve the prescribed learning outcomes. Assessment focuses on the acquisition of scientific concepts (including understanding basic concepts, natural phenomena, and causal relationships) and scientific competence (skills acquired through investigative work). All three types of assessment are present: assessment as learning, assessment for learning and assessment of learning (Ministry of Science and Education, 2019a: 13).

However, this curriculum may pose particular challenges for students with reading and writing difficulties—especially those with dyslexia. This paper explores how targeted support strategies affect the learning results of students with dyslexia. While all students received the same initial support strategies based on professional assessments, these strategies were continuously adjusted throughout the year to meet the actual needs of each student, based on the teacher's reflection, the nature of the content, and the skills being taught. Therefore, the aim of this research was to examine how the application of the same basic support strategies, individualised through continuous teacher reflection, affects the development of knowledge and scientific skills in students with dyslexia.

Methods

Aim of the research

Explore how targeted support strategies affect the earning results of students with dyslexia during the implementation of fifth-grade *Science* learning outcomes.

Research questions

1. How do students with dyslexia differ in their ability to learn *Science*?
2. How do the same support strategies influence students with dyslexia individually?
3. How do teachers' reflection and adjustment of support strategies during the school year affect their ability to meet the needs of students with dyslexia?

Sample

The research sample consisted of four fifth-grade students with an official decision to follow an individualised educational programme based on a diagnosis of dyslexia. The study was conducted during the 2024/25 school year in one primary school. To protect the students' anonymity, the labels Student A, Student B, Student C, and Student D are used throughout this paper.

Research Procedure

The research was conducted throughout the school year in three phases. In the first phase, an assessment of the students and an initial written test were carried out (September and October). The results showed no statistically significant differences in prior knowledge among the students. Based on these results, and in accordance with expert documentation, academic literature, and consultations with the school's special education teacher, all students received the same basic support strategies (Table 1).

Over the following months, during the instruction of curricular content, the subject teacher implemented the agreed-upon support strategies, continuously adapting and refining them based on each student's abilities, the content of the teaching units, and the applied teaching methods and formats—all with the goal of improving student achievement. The students themselves actively participated in the process through self-reflection, feedback, and observations, thereby helping to shape and select the strategies that worked best for them.

During each teaching unit, in addition to formative assessment, students were also summatively assessed through oral or written evaluations. In total, three written assessments were conducted during the school year. The results (number of achieved points) were used to analyse each student's progress over time (intra-individual analysis) and to compare the students with each other (inter-individual analysis). The data were analysed using descriptive statistics.

Graphical adaptation	Language adaptation	Assessment adaptation
- marking the parts on the summary/board that the student needs to copy - in written materials (worksheets, written knowledge tests) use appropriate font (style and size), increased spacing, and left alignment of text - highlighting important information in various ways (bolding terms in the text, additional visual material, oral verification of key content)	- linguistic and semantic simplification of materials - breaking down content into smaller units -visualisation of content using simpler diagrams, infographics, etc. - precise and short instructions with oral verification of reading comprehension - reduced number of tasks for independent work during collaborative learning	- extended time for completing tasks - breaking down the process of solving written tasks - rearranging tasks according to the principle easy – difficult – easy - regular feedback on progress and opportunities for improvement/ advancement - checking reading comprehension during written tasks

Table 1. Support strategies for students with dyslexia

Research Instruments

Two main instruments were used in the study: observation checklists (Appendix 1), maintained by the teacher throughout the school year, which served as the basis for adapting support strategies to individual students (e.g., level of independence, task completion speed, necessity of visual adaptations); and written knowledge assessments, designed in accordance

with the *Science* subject curriculum and administered at the end of three teaching units: "Exploring Nature," "Life in the Air," and "Life in Water."

Each written assessment contained tasks of various cognitive levels as defined by the revised Bloom's Taxonomy (Anderson et al., 2001: 352) and consisted of two parts. The first part assessed conceptual understanding and knowledge (characteristics of nature and living beings, changes and processes in nature, observation of nature, composition and properties, organism adaptations), while the second part assessed scientific skills (analysis, generalisation, formulation of research questions, hypothesis development, planning of simple investigations, interpretation of results, and their presentation in the form of graphs/tables).

Statistical Analysis

Data was analysed by using descriptive methods. Descriptive statistics included means, medians, and standard deviations, and the results were also visualised using boxplot diagrams. Given the small sample size, the focus of the analysis was placed on the qualitative interpretation of patterns and changes. All statistical analyses were conducted using IBM SPSS Statistics software.

Results

The following section presents the results collected throughout the school year, including descriptive analyses, with the aim of gaining insight into students' progress and the effectiveness of the implemented support strategies in developing scientific competence. Table 2 shows each student's results on the three written assessments conducted during the school year, with the goal of tracking individual progress over time and evaluating the extent to which students, with the application of support strategies, were able to master the components of scientific competence (knowledge and skills defined by the *Science* subject curriculum).

Student A						
WA*	Mean	Std. Dev.	Min	Max	Median	Rank
1. WA	16,50	14,85	6,00	27,00	16,50	2,00
2. WA	15,25	6,01	11,00	19,50	15,25	1,50
3. WA	16,75	6,01	12,50	21,00	16,75	2,50
Student B						
WA	Mean	Std. Dev.	Min	Max	Median	Rank
1. WA	15,50	13,44	6,00	25,00	15,50	2,00
2. WA	17,75	3,89	15,00	20,50	17,75	2,50
3. WA	14,25	6,72	9,50	19,00	14,25	1,50
Student C						

WA	Mean	Std. Dev.	Min	Max	Median	Rank
1. WA	11,25	8,84	5,00	17,50	11,25	2,00
2. WA	10,25	4,59	7,00	13,50	10,25	1,75
3. WA	11,75	2,47	10,00	13,50	11,75	2,25
Student D						
WA	Mean	Std. Dev.	Min	Max	Median	Rank
1. WA	8,00	7,78	2,50	13,50	8,00	2,00
2. WA	9,25	1,06	8,50	10,00	9,25	1,75
3. WA	11,75	2,47	10,00	13,50	11,75	2,25

* Note: WA - written assessment

Table 2. Student Performance on Written Knowledge Assessments (Intraindividual Comparison)

Student A demonstrated stable and consistent performance across all three written tests during the school year. The mean scores and medians were almost identical in all measurements, and ranks also confirm that the student did not significantly improve or decline but maintained a consistent level of mastery of the material (Table 2). This profile indicates cognitive stability but also possible stagnation, which suggests that it would be useful to consider differentiated strategies or additional incentives for the development of science skills in the next period.

Student B showed a slight improvement in the second test (M = 17.75), but the score dropped again in the third test (M = 14.25), resulting in no sustainable progress throughout the school year. The first test showed the greatest variability (SD = 14.85), indicating initial uncertainty, and the ranks shown (Table 2) support this fluctuation. Overall, the student displayed an unstable pattern of results, with a short-term improvement in the middle of the year but no lasting progress. This pattern may indicate that the support strategies were partially effective at some point but failed to ensure long-term stabilisation of achievement. It is possible that some content or types of tasks in the third test required additional adjustments or different forms of support. The results for Student B emphasise the importance of continuous evaluation of strategy effectiveness and flexibility in adapting them to the content and skill development.

Student C achieved the lowest score in the second test (M = 10.25) and the best in the third test (M = 11.75), while the first test was in the middle (M = 11.25). The ranks also (Table 2) confirm this pattern of slight improvement from the second to the third test. Overall, Student C shows slight fluctuations without a clear upward trend, but it is possible that stabilisation and improvement occur in the third period. Student C shows some potential for progress in the area of science skills, especially in the third test. The oscillations in results indicate the need for more targeted adaptations relative to specific teaching content, as the positive shift happens

precisely when the student likely better understands the task requirements and establishes a working routine.

Student D showed the clearest trend of improvement throughout the school year. Scores increased from 8.00 on the first test to 9.25 on the second and 11.75 on the third, with a simultaneous reduction in variability (SD from 7.07 to 3.18). The ranks (Table 2) show a clear upward pattern. Student D shows the most consistent pattern of progress, both in the overall score and in reduced variability, which may indicate increased confidence and better adaptation to task demands. The results suggest that the student responded well to the applied methods and that further systematic support could further stimulate the development of their science skills.

Below is an interindividual analysis of the students' success across all three written tests combined, in the part related to knowledge acquisition (Figure 1, part A) and science skills (Figure 1, part B). The comparison is considered in the context of the degree of dyslexia, which served as the basis for adapting the support strategies.

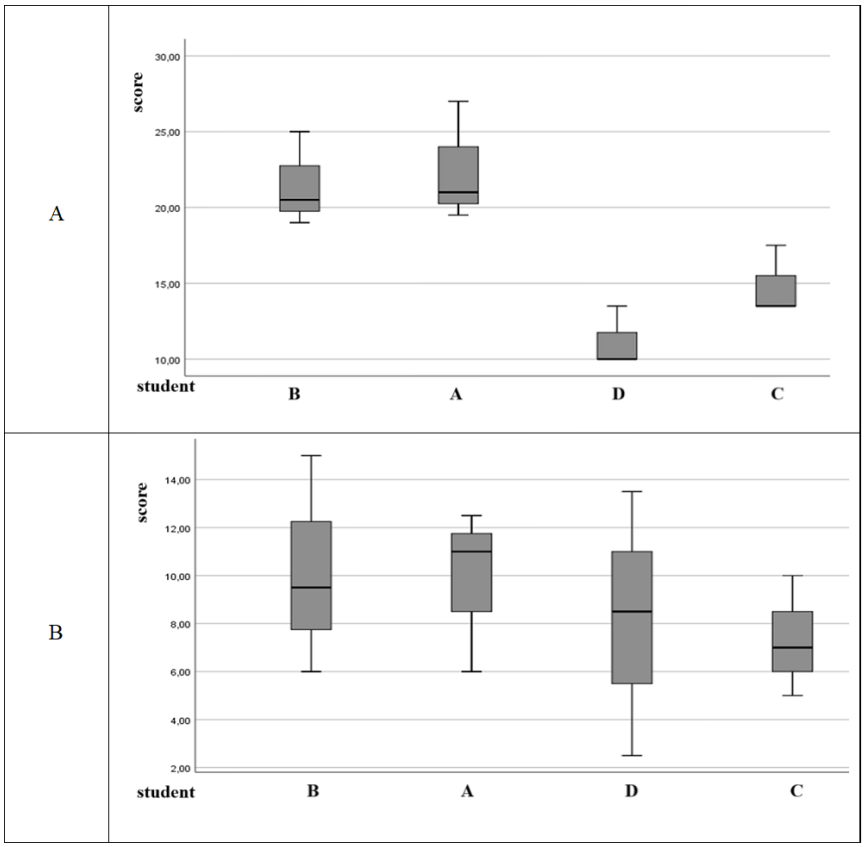

Figure 1. *Comparison of students' results in knowledge tasks (part A) and science skills tasks (part B) across three written tests*

The boxplot diagrams provide insight into differences among students in knowledge and skills, in the context of the degree of dyslexia and support adaptations. Student A was the most successful compared to the other students in knowledge acquisition (Figure 1, part A) as well as in scientific literacy (Figure 1, part B). They achieved the highest median and the smallest result dispersion. This student has a mild form of dyslexia. According to the teacher's observation, this student shows a high degree of independence and, apart from graphic adaptations of written tasks, does not require additional support strategies. They have a good vocabulary and independently follow even more complex instructions. When presenting publicly, they need a little more preparation time (mild stuttering may occur if preparation time is insufficient). Based on this, the following adaptations in support strategies were made: graphic adaptation of text in written materials (appropriate font style and size, increased spacing, and left-aligned text), highlighting key points in the text (bolding terms, additional visual material), and occasional checks and guidance in creating graphical representations of results after practical work.

Compared to Student A, Student B achieved slightly lower results and had the second-highest median in the group in both parts of the written test (Figure 1). Greater result dispersion is visible in tasks testing skills (Figure 1, part B), which can be partially attributed to ADHD, also diagnosed in this student, causing them to occasionally overlook certain elements due to lack of attention. Their attention needs to be periodically redirected to tasks (giving short instructions at appropriate time intervals and monitoring and guiding work). In class, they are practiced, systematic, and mostly accurate (both in written and oral presentation). Graphic and occasional linguistic adaptation of materials is required (appropriate font size and style, increased spacing, and left-aligned text; highlighting key terms in the text and during presentations, and occasional additional visualisation of content). Both students (A and B), due to mild dyslexia with minimal difficulties, take notes from the board and complete student records /summary during tasks (which includes simple graphic representations).

Student C's results do not show excessive dispersion, but are generally quite low compared to the other students in the study (Figure 1). The median on the written test assessing skills is the lowest in the group (Figure 1, part B), while the median in knowledge acquisition is second to last (Figure 1, part A). Student C regularly requires most of the support strategies chosen by the teacher at the start of the school year during regular classes. In addition to graphic adaptations (appropriate font style and size, left-aligned text, increased spacing; highlighting key terms by bolding), linguistic adaptations are necessary (simplification of text and

instructions), regular checking of comprehension, and extra time for writing (usually they only manage to write what students on adapted programs write—the teacher sends the text differences via Teams). They need a great deal of help during practical work in class (either from the teacher or other students). It is important to monitor and guide them during experiments and give instructions individually in suitable intervals. Assistance is almost always needed in summarising results and conclusions after practical work. Thorough feedback and occasional invitations to supplementary classes to compensate for content and practice handling equipment and recording results (tables and graphs) are necessary. According to documents provided by parents, the student also has other comorbidities (short-term memory difficulties), and considering the observed difficulties, their dyslexia could be characterised as moderate to severe.

Student D achieved the lowest median in concept acquisition tests (Figure 1, part A), while in scientific literacy (skills) tests, they achieved the third-highest result with high dispersion (Figure 1, part B). Student D shows some vocabulary poverty in Croatian and sometimes expresses themselves more easily in English (they have not lived abroad, but spend a lot of time online). Graphic and linguistic adaptations of tasks and texts are necessary, along with regular checking of reading comprehension. The most commonly used support strategies include: adapting materials to an appropriate font style and size, left-aligned text, increased spacing, bolding key terms in the text, occasionally translating terms into English besides linguistic simplification, additional visualisation of processes, allowing extra time for tasks, and occasionally providing a partner during experiments who monitors the timeliness of instructions. In topics that interest them more (e.g., Life in the Air), the student is more active and easily connects learned material to everyday life, while in less interesting or more abstract topics, greater support is needed. The student is creative in noticing patterns and finding solutions during practical work and experiments, but sometimes needs help forming answers due to a lack of basic terminology. Compared to other students in the sample, his dyslexia would be characterised as moderate.

For students C and D, additional visual materials are necessary (especially if a concept is more abstract), but these should not be overly complex in presentation (they respond better to a series of drawings/images). They also require extra support in visual tasks involving tables and graphs, as well as help summarising conclusions after practical work.

Discussion

The results of this study indicate that all students, despite varying degrees of dyslexia, achieved a certain level of success in developing scientific competence when provided with tailored support strategies. Distinct patterns emerged in performance, partially associated with the severity of dyslexia, the presence of comorbidities, and each student's level of independence in learning. Students with mild dyslexia demonstrated more stable and higher outcomes with minimal adaptations, while those with moderate to severe dyslexia showed lower and more fluctuating results and required more intensive and diverse support—particularly in tasks involving skill application and abstract concepts.

Teacher observations underline the importance of flexible and reflective implementation of strategies tailored to each student's actual needs. Given the established link between the severity of difficulty and performance in knowledge and skills tasks, it is vital to thoroughly understand the learning barriers presented by dyslexia and systematically overcome them through instruction.

Reading and writing are essential for acquiring knowledge, yet students with dyslexia often experience significant difficulties in these domains. Therefore, inclusive education must use support strategies that help these students overcome such challenges, thus facilitating their full developmental potential. In addition to reading and writing difficulties, students with dyslexia may struggle with memory, retention, and the speed of recall—in particular, short-term and working memory. Short-term memory affects fluent reading, so these students have difficulty generalising previously read words, following the sequence of sentences or instructions while processing content or during assessments, and remembering distinct stages of tasks (Galić-Jušić, 2004: 304). Furthermore, studies by Thomson (2007: 18) and Kaminska-Ostep & Gulinska (2008: 147–154) identify challenges specific to science subjects (Science, Biology, Physics, Chemistry), including difficulties remembering and interpreting symbols, formulas, and equations; retaining procedural steps in practical experiments; reading and recording experimental results; and remembering specific terminology, sometimes leading to misunderstanding of content.

Students A and B performed well in both concept acquisition and scientific literacy tasks. Student C performed better in knowledge-based tasks than in scientific skills tasks, which may be partly related to organisational challenges and a weaker ability to summarise answers. Student D showed greater success in science-skills tasks than in concept acquisition, which

aligns with their creativity in practical problem-solving, but a weaker grasp of basic terminology.

While the literature provides general characteristics of dyslexia, it is critical to remember that each student is unique. Thus, individualisation in teaching and learning should respond to the diversity and individuality of each student, and educational systems are obliged to ensure quality education based on individual differences (Eikeland & Ohna, 2022: 157–170). In this study, general support strategies were implemented at the start of the school year and refined through reflective practice in response to student needs. Reflection helps teachers become aware of their instructional processes and outcomes and assess whether goals align with their expectations (Tot, 2013: 244). Hattie (2015: 38) emphasises that teachers should use evidence of outcomes to improve their teaching. Through reflective teaching, educators identify areas for improvement and plan development that leads to positive changes in their knowledge, beliefs, teaching practices, and students' learning (Labak, 2020: 461–480). Reflection is an essential tool for both teachers and students in inclusive education.

It is clear that learning itself poses significant challenges for students with dyslexia—especially in higher grades where independent learning and responsibility for one's own learning process are expected. Self-regulated learners are those who know themselves well, set clear learning goals, know how to learn, and do so independently, flexibly adapting their learning strategies to their traits, environment, and content demands (Ministry of Science and Education, 2021: 128). To develop self-regulation, students need timely feedback from teachers during both learning and assessment phases.

As noted earlier, not all dyslexia is the same. Dyslexia can be classified as mild (completely compensated with appropriate support strategies), moderate (persistent difficulties despite support), or severe (often with multiple comorbidities) (Snowling, Hulme & Nation, 2020: 501–513). In some cases, it is necessary to seek additional specialist support to enable students to reach their potential. Importantly, dyslexia does not define the whole student. Literature shows that students with dyslexia can have above-average strengths in areas such as innovative, creative, and artistic thinking, as well as visual learning and processing (Gilger & Hynd, 2008: 214–228; Mortimore, 2008: 336). These strengths can form the basis for problem-based investigative learning using visual aids in science instruction and the development of scientific literacy.

The main limitation of this study is the very small sample—only four students with dyslexia—making generalisation difficult. Additionally, the types and severity of dyslexia were not fully comparable among students, and while baseline strategies were consistent, adaptations were individualised—complicating direct comparison. The study was conducted under real classroom conditions, so results may have been influenced by external factors (student motivation, content complexity, teaching methods, etc.). Although the written assessments were carefully prepared, they were not standardised, which is another limitation for interpreting results. Despite these constraints, this research provides insights into individual learning patterns of students with dyslexia and demonstrates how reflection-based tailored support strategies can positively influence progress.

For future research, it is recommended to include a larger number of students with dyslexia, as well as a control group without learning difficulties, to more accurately assess support strategies' efficacy. Further, developing and using standardised instruments to assess science skills and examining the impact of individual strategies on different aspects of scientific competence would enhance the validity of findings.

Implications for Teaching – Practical Approaches for Educators

The findings indicate that students with dyslexia can successfully develop knowledge and scientific skills when given structured, consistent, and flexible support. For teachers, this means support must not be universal or static—but continually adapted through regular reflection and observation of each student.

In practice, this includes:

- graphic organisers and additional visual aids to improve content comprehension
- linguistic adaptations (simplified terminology and additional explanations)
- graphical adaptation of text
- clear instructions for practical tasks broken into shorter units
- time accommodations (extended time for writing)
- structured support during practical work and experiments (pair or group work)
- templates for formatting and presenting measurement/experimental results

- proactive communication with students about what helps them, where they struggle, and which strategies they find useful

Additionally, involving students in reflecting on strategies themselves helps them build awareness of what supports their learning, promoting long-term independence and confidence. Science instruction should maintain an emphasis on inquiry-based learning and skill development, while giving extra attention to linguistic accessibility and task structure. Teachers do not need to find the "perfect" strategy but should remain open to adaptation and learning from daily practice. This research demonstrates that through continuous reflection and flexibility, progress is possible even for students facing significant educational challenges.

Conclusion

Dyslexia is a lifelong learning difficulty that requires an individualised approach, especially in foundational subjects like science. Each student in this study had their interests, strengths and weaknesses that influenced their work habits and Science learning outcomes. Each student with dyslexia is unique, so support strategies should be flexible and responsive not only to the learning difficulty but also to other individual characteristics, including possible comorbidities. Students with mild dyslexia had an easier time following classes and participating in class work, while students with more severe dyslexia struggled more.

This study examined learning and skill development patterns in four students with dyslexia, all receiving the same foundational support strategies that were adjusted via reflective practice. Given the individuality of students, it was assumed that the selected strategies would not have the same effect on all students and that they should be adjusted during teaching. While results cannot be generalised due to the small sample, the patterns observed suggest that support strategies can lead to stability or improvement—especially when adapted to student needs and lesson complexity. It was again shown that students with mild dyslexia responded better to support strategies, while for students with more severe dyslexia, they had to be further developed.

It is important that the teachers are well aware of the learning outcomes, choose the right working methods and assessments and adapt them to their students with dyslexia. Teachers should regularly reflect on individualised methods to timely recognise what works and what needs adjustment. Teaching self-regulation also contributes to learning effectiveness by helping

students become more aware of their needs and strategies that support their knowledge acquisition and skills development.

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Appendix 1

Support Strategies Assessment List

Student's Name:			
Teaching Topic/Unit:			
Predominant Activities During Teaching:			
Support Strategies	Application of Strategy		
During teaching, it is necessary to:	rarely/never	occasionally	always
mark essential parts of the text on the board plan that the student needs to copy			
graphically adapt the text in written materials (appropriate font – style and size, increased spacing, and left-aligned text)			
highlight important information in various ways (bold key terms in the text, add visual materials, oral checks, and emphasise the important points)			
linguistically and semantically simplify the material			
break down the content into smaller units			
further visualise content using simpler diagrams, infographics, etc.			
give precise and brief instructions along with oral checks of understanding			

reduce the number of tasks for independent work during cooperative learning			
During assessment, it is necessary to:	rarely/never	occasionally	always
provide extended time for completing tasks			
break down written tasks into smaller units and assign them at spaced intervals			
alternate tasks following the principle: easier – harder – easier			
give regular feedback on progress and possibilities for improvement			
check understanding of the read material during written tasks			
During experiments it is necessary to:	rarely/never	occasionally	always
provide a lab partner for collaboration			
monitor and guide students throughout the experiment			
give instructions for new stages of work at time intervals			
prepare partially completed graphic representations (infographics or charts) for displaying results			

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INDIVIDUALIZACIJA NASTAVE I STRATEGIJE PODRŠKE U RAZVOJU PRIRODOSLOVNE KOMPETENCIJE KOD UČENIKA S DISLEKSIJOM U 5. RAZREDU

Sažetak

Razvijanje prirodoslovne kompetencije koja uključuje razumijevanje pojmova, znanstveno razmišljanje i rješavanje problema ključno je za sve učenike, uključujući i one s disleksijom. Kako bi se i njima omogućilo uspješno ostvarivanje kurikulumskih ishoda, u nastavi se primjenjuju ciljanje strategije podrške. Cilj istraživanja bio je ispitati kako primjena istih osnovnih strategija podrške, individualiziranih kroz kontinuiranu učiteljsku refleksiju, utječe na razvoj znanja i prirodoznanstvenih vještina kod učenika s disleksijom. U istraživanju su sudjelovala četiri učenika s različitim stupnjem disleksije. Provedene su tri pisane provjere, a rezultati su analizirani intraindividualno (razvoj prirodoslovne kompetencije svakog učenika kroz godinu) i interindividualno (međusobna usporedba učenika u znanju i vještinama s ciljem uvida u to kako stupanj disleksije i s njime povezane prilagodbe strategija podrške utječu na uspješnost u različitim vrstama zadataka). Primijenjena je deskriptivna statistička obrada uz grafički prikaz rezultata. Rezultati pokazuju da su svi učenici, unatoč različitim stupnjevima disleksije, uz primjenu individualiziranih strategija podrške razvijali određenu razinu prirodoslovne kompetencije. Učenici s blažim teškoćama bili su uspješniji i stabilniji, dok su oni s izraženijim teškoćama pokazivali veće oscilacije i potrebu za intenzivnijom podrškom. Sustavna i reflektivna primjena podrške može omogućiti učenicima s disleksijom napredak u znanju i vještinama, prilagođen njihovim individualnim potrebama i kurikulu Prirode.

Ključni pojmovi: učenici s teškoćama; inkluzivno obrazovanje; prirodoznanstvena pismenost; reflektivna praksa