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“Nurturing Inclusive Learning through Nature-Based Education for Neurodiverse Children”

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REPORT from the Needs Analysis

Prepared by



This report presents the findings of a cross-national study conducted within the project *“Nurturing Inclusive Learning through Nature-Based Education for Neurodiverse Children.”* The research was carried out in March 2026 across three countries: North Macedonia,

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Croatia, and Cyprus. The project aims to strengthen inclusive education by exploring how nature-based learning can support autistic and other neurodiverse students.

The study examines educators' experiences, practices, and needs regarding inclusive and nature-based education. It focuses on key areas, including professional background, teaching context, use of outdoor activities, confidence in supporting neurodiverse learners, and perceived barriers to implementation. A comparative approach allows for the identification of both shared patterns and country-specific differences.

The findings indicate that most participants work in mainstream, public, and predominantly urban educational settings, and that a large proportion already support neurodiverse students in their daily practice. However, the integration of nature-based learning remains inconsistent, often limited to occasional use and influenced by factors such as access to natural environments, training opportunities, and confidence levels.

This report highlights a gap between educators' responsibilities and their preparedness to effectively combine inclusive practices with outdoor learning. By identifying these challenges and needs, the study provides a foundation for developing practical resources, targeted training, and evidence-based strategies to support more inclusive and engaging learning environments for neurodiverse children.

The results displayed in **Figure 1** indicate that the distribution of professional roles varies across the three countries, showing distinct structural differences in educational staffing. In North Macedonia, the largest proportion of participants are primary school teachers (39%), followed by special education teachers (25%) and preschool teachers (21%). In Croatia, teaching assistants/support staff represent the largest group (31%), notably higher than in other countries, followed by special education teachers (23%) and preschool teachers (16%). In Cyprus, the sample is dominated by primary school teachers (50%), while preschool teachers (17%) and special education teachers (17%) are represented in roughly equal proportions. Across all countries, the category "Other" remains relatively low (10–16%), indicating that most participants belong to clearly defined educational roles. These results highlight that Croatia relies more on support staff, whereas North Macedonia and Cyprus rely more on teaching professionals, especially at the primary level.

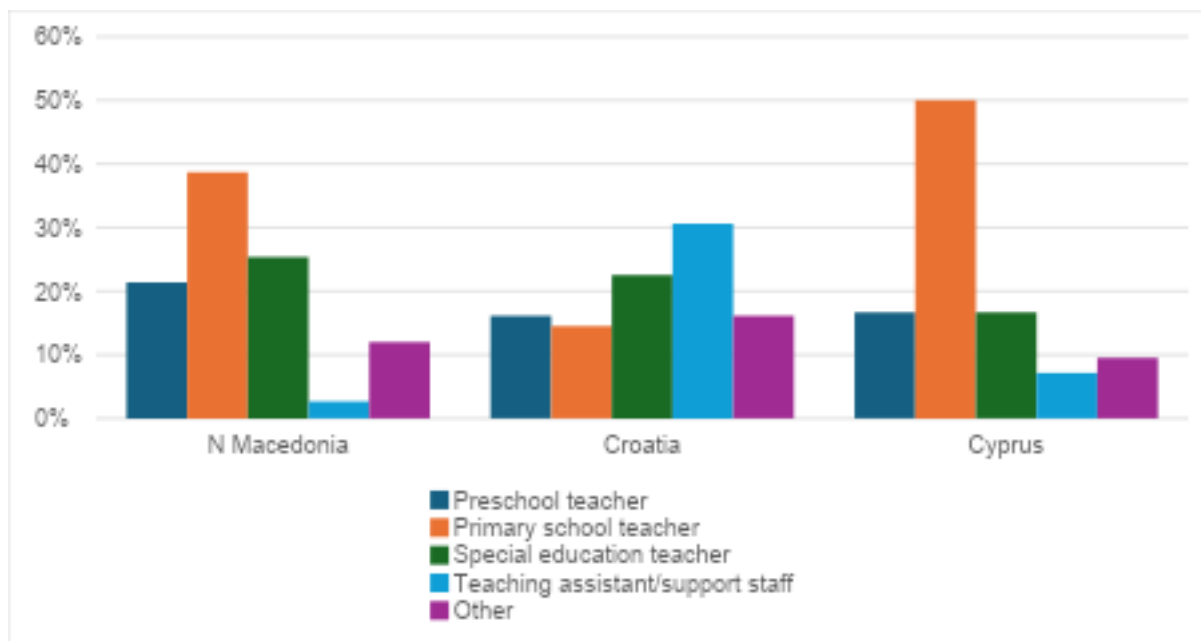


Figure 1. Current role of the participants

Figure 2 presents the distribution of the years of teaching experience. The sample shows a generally experienced sample, with some variation between countries. In North Macedonia, most participants fall into the 6–10-year (28%) and 2–5-year (25%) age groups, indicating a relatively balanced distribution of mid-level experience. In Croatia, the largest group has more than 20 years of experience (27%), followed by 2–5 years (21%) and 11–20 years (19%), suggesting a mix of early-career and highly experienced professionals. In Cyprus, the majority of participants have more than 20 years of experience (55%), indicating a highly experienced workforce compared to the other countries. The proportion of participants with less than 2 years of experience is low across all countries (4–15%), showing limited representation of early-career teachers. Overall, the data indicate that the sample is predominantly composed of experienced educators, particularly in Cyprus.

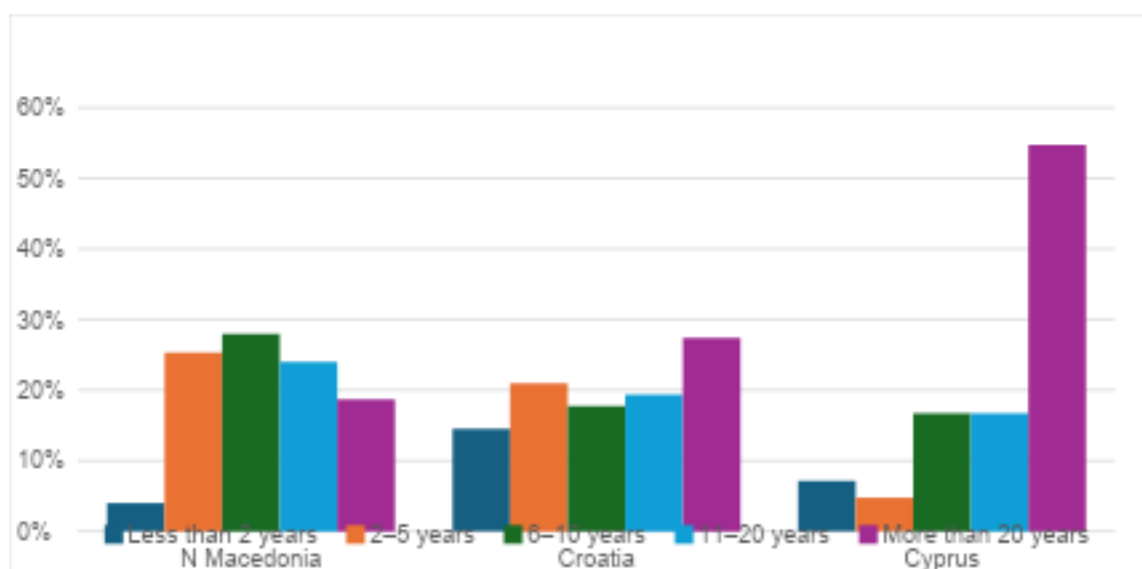


Figure 2. Years of teaching experience of the participants

As shown in **Figure 3** The distribution of educational settings shows that mainstream education is the dominant context across all three countries. In North Macedonia, the majority of participants work in mainstream schools/kindergartens (71%), followed by special schools (23%), while inclusive classrooms (7%) are less represented. In Croatia, mainstream settings are also the most common (55%), but there is a notably higher proportion of special school settings (34%) compared to the other countries, along with some representation of inclusive classrooms (11%). In Cyprus, mainstream education is overwhelmingly dominant (81%), with very low representation of special schools (5%), inclusive classrooms (7%), and a small presence of outdoor/forest schools (7%). Inclusive and outdoor/forest educational settings remain limited across all countries, indicating that alternative or inclusive models are still not widely implemented. Overall, the findings suggest that mainstream education remains the primary setting, while specialised and alternative environments are less common and vary by country.

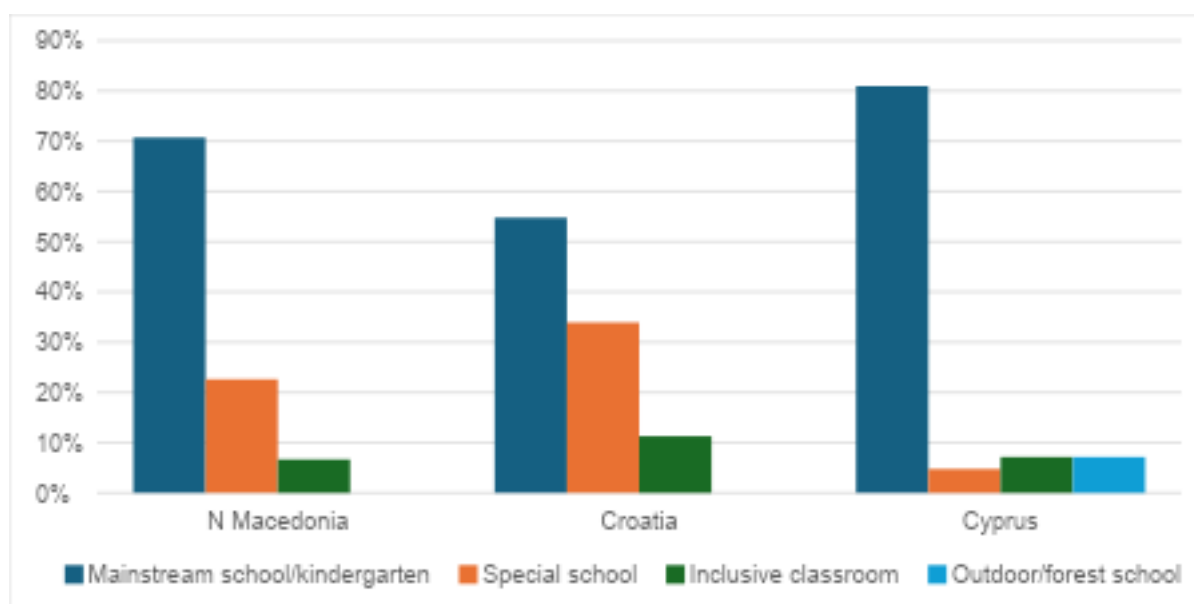


Figure 3. Educational setting of the participants

Figure 4 highlights cross-country variations. The geographical distribution of schools indicates a strong concentration in urban areas across all three countries. In North Macedonia, nearly all participants are based in urban areas (97%), with very minimal representation from suburban (1%) and rural areas (1%). In Croatia, urban areas also dominate (85%), but suburban (13%) and rural schools (2%) are slightly more prevalent than in North Macedonia. In Cyprus, although urban areas still represent the majority (64%), there is a more balanced distribution, with higher proportions of suburban (19%) and rural schools (17%). The presence of rural and suburban schools is most notable in Cyprus, suggesting greater geographical diversity in the sample compared to the other countries. Overall, the data indicate that the findings primarily reflect urban educational contexts, with limited representation of rural environments.



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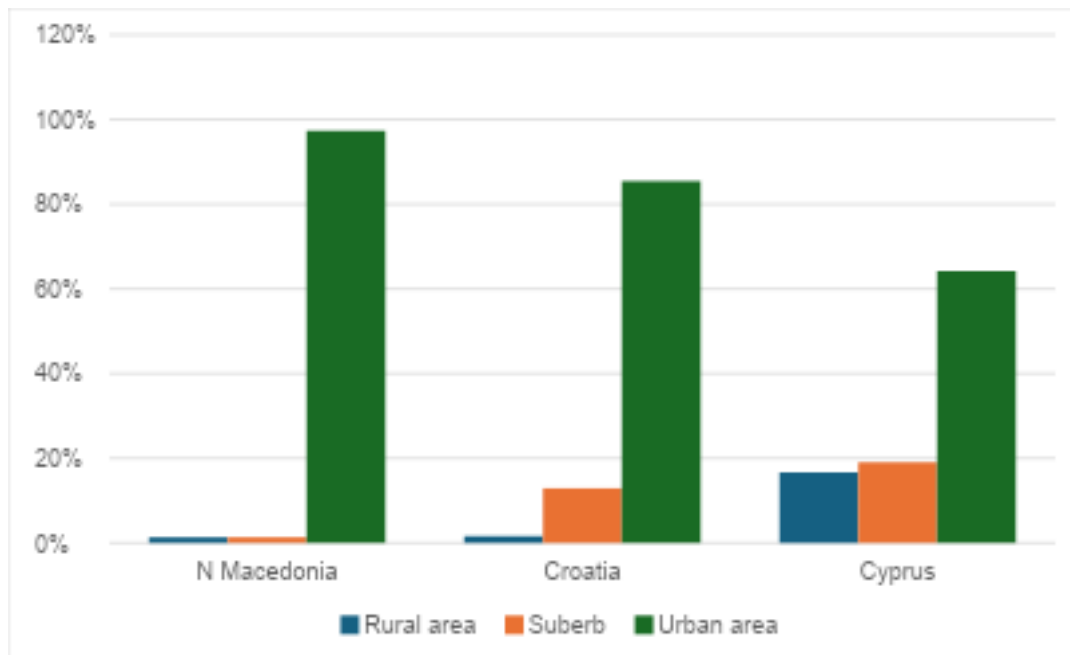


Figure 4. Location of the participant's school

A comparison across countries (Figure 5) shows that public education dominates across all three countries. In North Macedonia, the vast majority of participants (93%) work in public institutions, while only a small proportion (7%) are employed in private institutions. In Croatia, all participants (100%) are from public institutions, with no representation from the private sector. In Cyprus, although public institutions still dominate (79%), private institutions (21%) are more noticeable than in other countries. The data indicate that private education plays a limited role overall, with Cyprus showing the highest level of private sector involvement. Overall, the findings suggest that the study's results largely reflect public education systems.

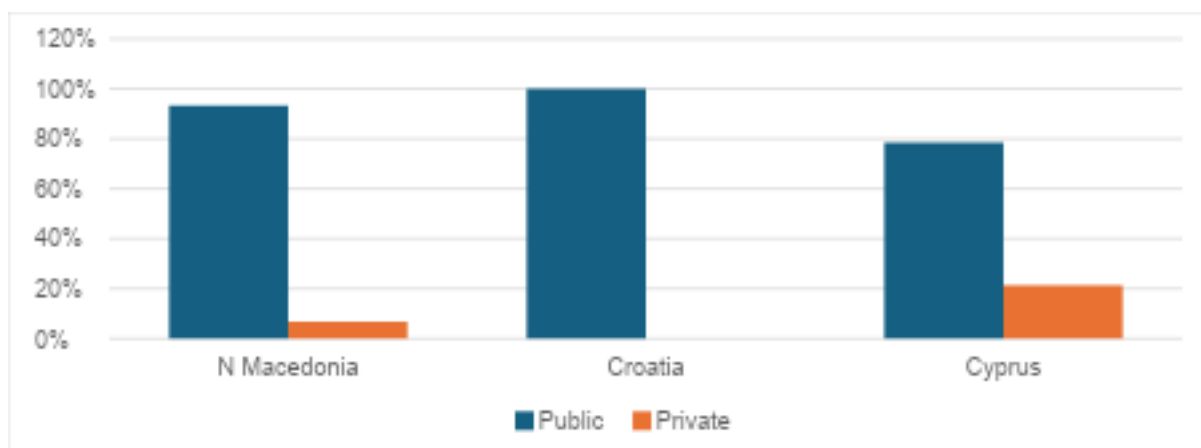


Figure 5. Type of institution of the participants

Access to natural environments (**Figure 6**) varies across the three countries, with clear differences in availability and proximity. In North Macedonia, the majority of participants

report access to a park or green area within walking distance (68%), while a notable proportion indicate no easy access (29%), and only a small percentage have access to larger natural areas such as forests (3%). In Croatia, access to nearby green spaces is very high: 87% report parks within walking distance, while only 5% report no easy access and 8% report access to larger natural environments. In Cyprus, 71% of participants report access to nearby parks, while a higher proportion compared to Croatia (21%) indicate no easy access, and 7% report access to forests or large green areas. The availability of nearby green spaces is highest in Croatia, whereas North Macedonia and Cyprus face greater challenges with accessibility.

Overall, while most participants have some level of access to natural environments, a significant proportion—particularly in North Macedonia and Cyprus—face barriers that may limit the implementation of nature-based activities.

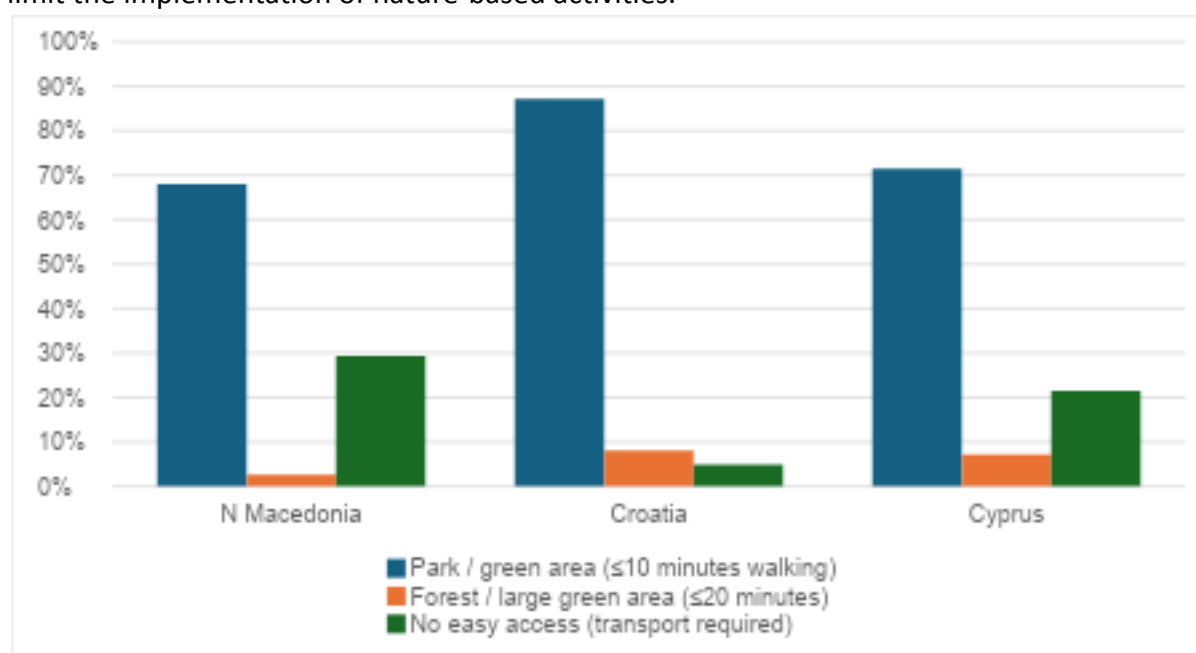


Figure 6. Access to the natural environments of the participants' school

The data in **Figure 7** reveal that the frequency of nature-based activities varies across countries, with most educators engaging in such activities occasionally rather than regularly. In North Macedonia, the most common frequency is 1–2 times per month (55%), followed by smaller proportions engaging weekly (7%), 2–3 times per week (11%), or daily (11%), while 17% report never using nature-based activities. In Croatia, participation is more frequent, with both 1–2 times per month (31%) and once a week (31%) being equally common, and a higher proportion engaging daily (21%) compared to the other countries. Only a small percentage (3%) report never using such activities. In Cyprus, the dominant pattern is also 1–2 times per month (57%), but a relatively high proportion (29%) reports never engaging in nature-based activities, while regular engagement (weekly or more often) remains limited. Croatia demonstrates a higher level of regular engagement in nature-based activities, whereas North Macedonia and Cyprus rely more on occasional implementation. Overall, the findings suggest that nature-based learning is not yet a routine practice for most educators, with the majority implementing it on a limited or occasional basis.



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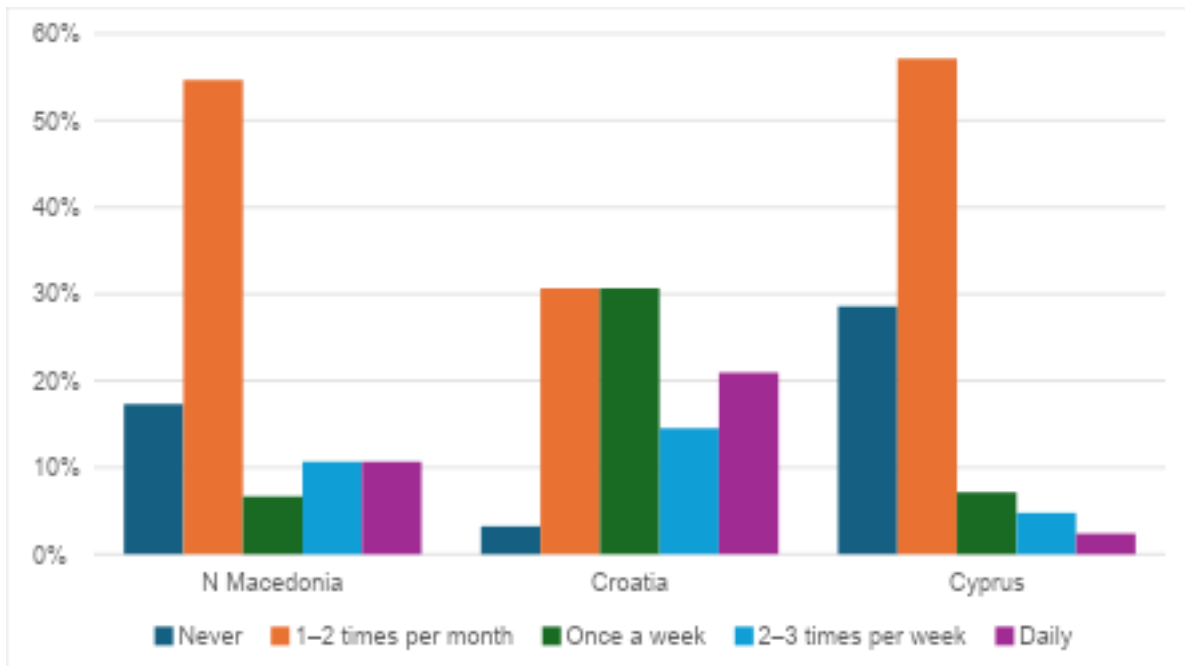


Figure 7. Frequency of Implementing Nature-Based Activities with Students

A large proportion of participants across all three countries report working with autistic or other neurodiverse students, indicating the high relevance of inclusive practices in their daily work (**Figure 8**). In North Macedonia, 69% of participants report working with neurodiverse students, while 31% do not. In Croatia, this proportion is even higher: 79% of participants work with neurodiverse students, while only 21% do not. In Cyprus, 74% of participants report working with neurodiverse students, while 26% do not. Croatia shows the highest level of engagement with neurodiverse students, followed by Cyprus and North Macedonia. Overall, the findings demonstrate that educators across all countries are directly involved in supporting neurodiverse learners.



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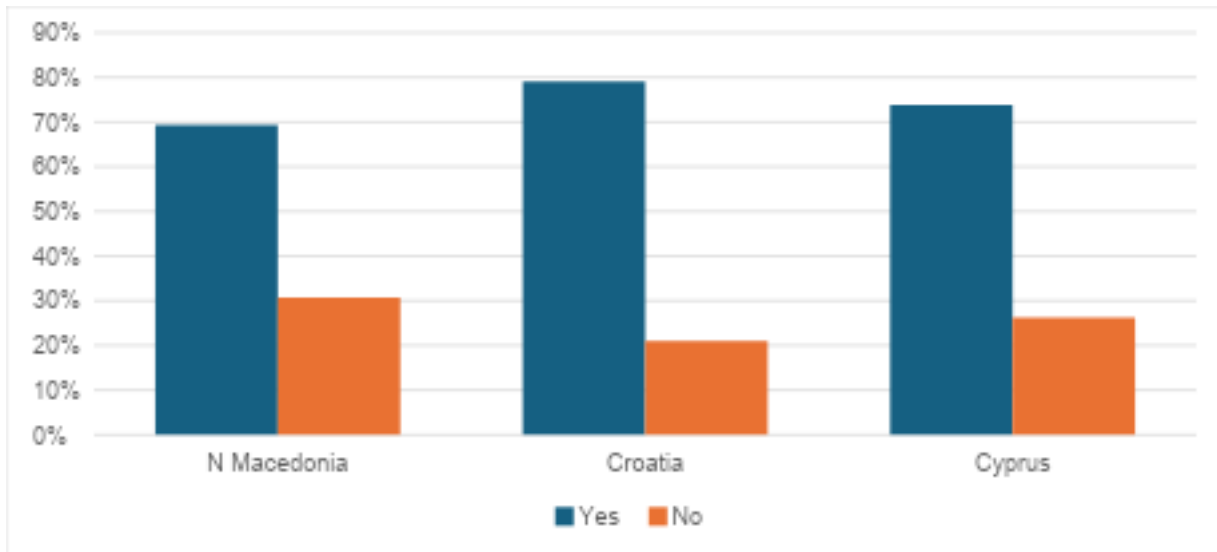


Figure 8. Current work with autistic or other neurodiverse students

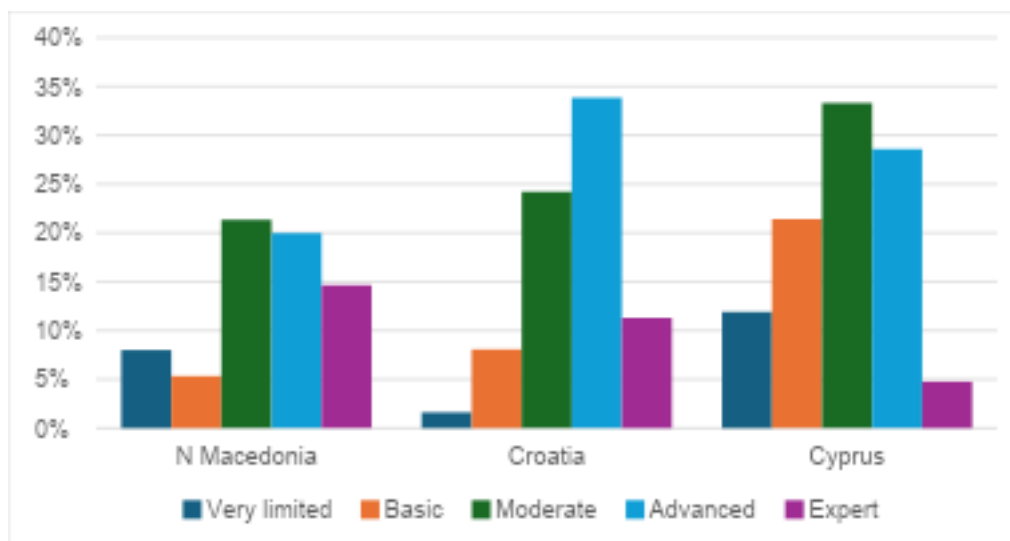


Figure 9. Experience Level in Supporting Autistic and Neurodiverse Students

The self-reported experience levels in working with autistic or neurodiverse students vary across countries (**Figure 9**), with most participants indicating moderate to advanced levels of experience. In North Macedonia, the largest groups are those with moderate (21%) and advanced (20%) experience, followed by expert (15%), while fewer participants report very limited (8%) or basic (5%) experience. In Croatia, the majority of participants report advanced experience (34%), followed by moderate (24%) and basic (8%), with very few indicating very limited experience (2%) and a smaller proportion identifying as experts (11%). In Cyprus, the most common level is moderate (33%), followed by advanced (29%) and basic (21%), while fewer participants report very limited (12%) or expert (5%) experience. Croatia stands out with the highest proportion of participants reporting advanced experience, whereas Cyprus shows a broader distribution with more participants at basic and moderate levels. Overall, the findings suggest that most educators have at least



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a moderate level of experience in supporting neurodiverse students, although the proportion of expert-level practitioners remains relatively low across all countries.

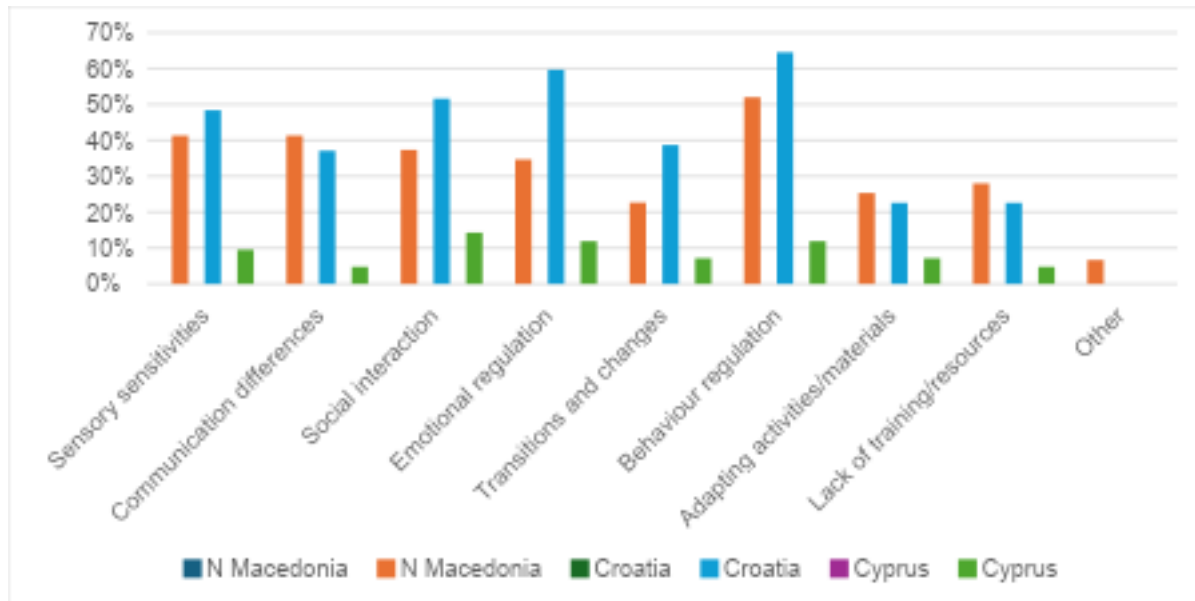


Figure 10. Most Frequently Encountered Challenges in Supporting Autistic Students

As shown in **Figure 10**, participants across all three countries report a range of challenges when supporting autistic students, with behavioural and emotional aspects emerging as the most prominent. In North Macedonia, the most frequently reported challenges are behaviour regulation (52%), sensory sensitivities (41%), and communication differences (41%), followed by social interaction (37%) and emotional regulation (35%). In Croatia, behaviour regulation is the most significant challenge (65%), followed by emotional regulation (60%), social interaction (52%), and sensory sensitivities (48%), indicating a strong emphasis on behavioural and emotional difficulties. In Cyprus, the most frequently reported challenges are emotional regulation (approximately 12–14%), behaviour regulation (12%), and social interaction (14%), although the overall percentages are lower than in other countries. Challenges such as adapting activities/materials and lack of training/resources are present across all countries, but are reported less frequently than behavioural and emotional difficulties. The “Other” category is minimal, suggesting that the listed challenges capture the majority of difficulties experienced by educators.



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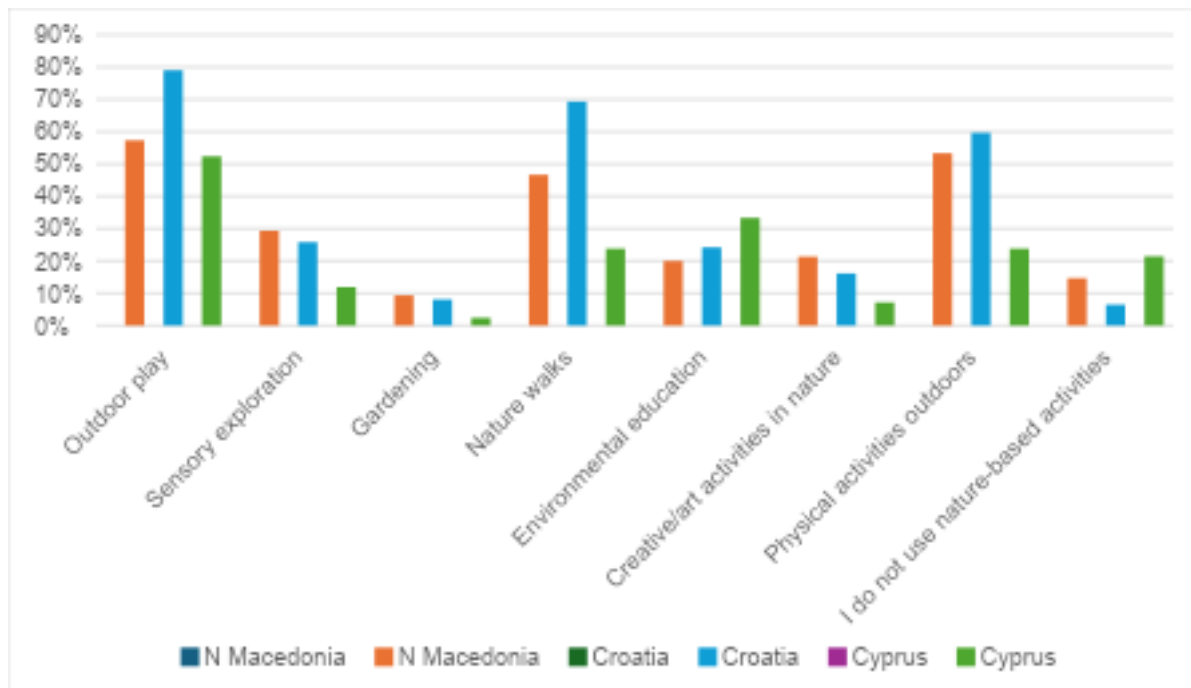


Figure 11. Types of Nature-Based Activities Used in Educational Practice

Figure 11 highlights cross-country variations in the types of nature-based activities educators use. The types of nature-based activities used by educators vary across countries, with outdoor play and physical activities being the most commonly implemented. In North Macedonia, the most frequently used activities are outdoor play (57%), physical activities outdoors (53%), and nature walks (47%), while sensory exploration (29%) and environmental education (20%) are used less often. Gardening (9%) remains the least common activity. In Croatia, outdoor play is highly prevalent (79%), followed by nature walks (69%) and physical activities outdoors (60%), indicating a strong integration of active outdoor learning. Sensory exploration (25%) and environmental education (24%) are moderately represented, while gardening (7%) is rarely used. In Cyprus, outdoor play (52%) and outdoor physical activities (23%) are the most common, while environmental education (33%) is used more than in other countries. Sensory exploration (12%) and gardening (2%) are less frequently applied. A notable proportion of participants, particularly in Cyprus (21%) and North Macedonia (15%), report not using nature-based activities at all, indicating gaps in implementation. Overall, the findings suggest that educators tend to prioritise general outdoor and physical activities, while more structured or specialised approaches, such as gardening and sensory exploration, are less commonly implemented.



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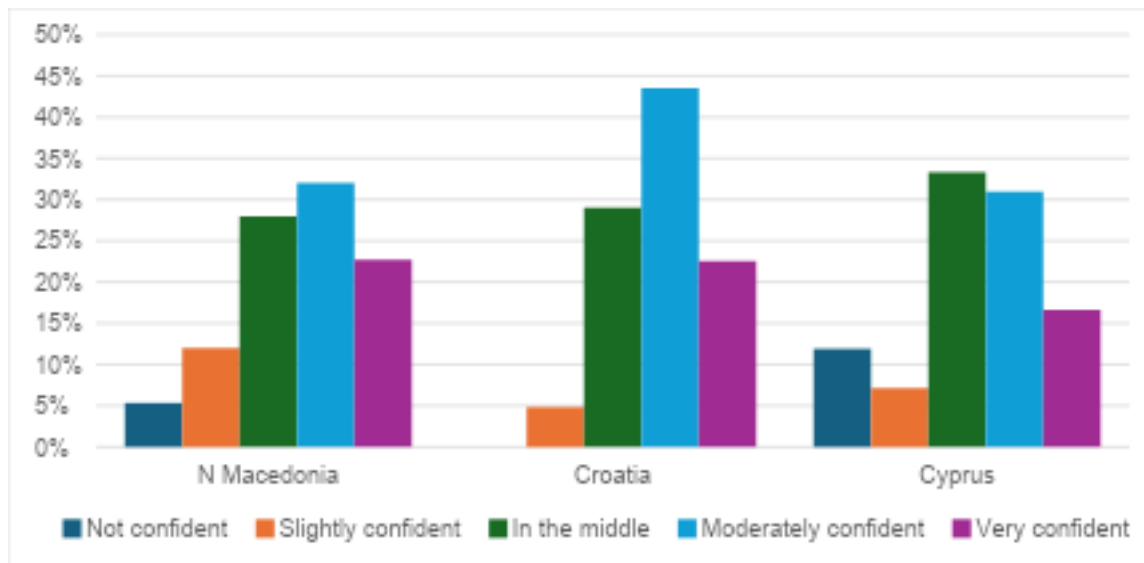


Figure 12. Educators' Confidence in Designing and Leading Outdoor/Nature-Based Sessions

As shown in **Figure 12**, Participants' confidence in designing and leading outdoor or nature-based sessions varies across countries, with most educators reporting moderate levels of confidence. In North Macedonia, the largest group reports being moderately confident (32%), followed by those in the middle (28%) and very confident (23%), while smaller proportions report slightly confident (12%) or not confident (5%). In Croatia, confidence levels are generally higher, with the majority reporting moderate confidence (44%), followed by moderate (29%) and very confident (23%), while very few participants report low confidence.

In Cyprus, participants are more evenly distributed, with the largest group reporting being in the middle (33%), followed by moderately confident (31%) and very confident (17%), while a higher proportion than in other countries report not being confident (12%). Croatia demonstrates the highest overall confidence, while Cyprus shows greater variability, including a higher proportion of lower-confidence levels. Overall, the findings suggest that while many educators feel reasonably confident in leading outdoor sessions, a substantial proportion still lack strong confidence, indicating the need for further support and training.

Participants' confidence in supporting autistic students during outdoor or nature-based activities (**Figure 13**) tends to be moderate to mid-level, with noticeable variation across countries. In North Macedonia, the largest proportions of participants report being moderately confident (29%) and in the middle (26%), followed by not confident (23%), while fewer participants report slightly confident (12%) or very confident (9%). In Croatia, the highest proportion of participants reports moderate confidence (35%), followed by in the middle (29%), with smaller groups indicating slightly confident (13%), very confident (16%), and very few reporting not confident (6%). In Cyprus, the majority of participants report being in the middle (50%), indicating uncertainty or moderate familiarity, while fewer report moderate confidence (14%) or very confident (10%), and a relatively higher proportion report not confident (19%). Croatia demonstrates the highest overall confidence, while Cyprus shows the greatest concentration of mid-level confidence and higher uncertainty. Overall, the findings suggest that while educators have some experience in supporting



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autistic students outdoors, many lack strong confidence, particularly in more complex or less structured environments.

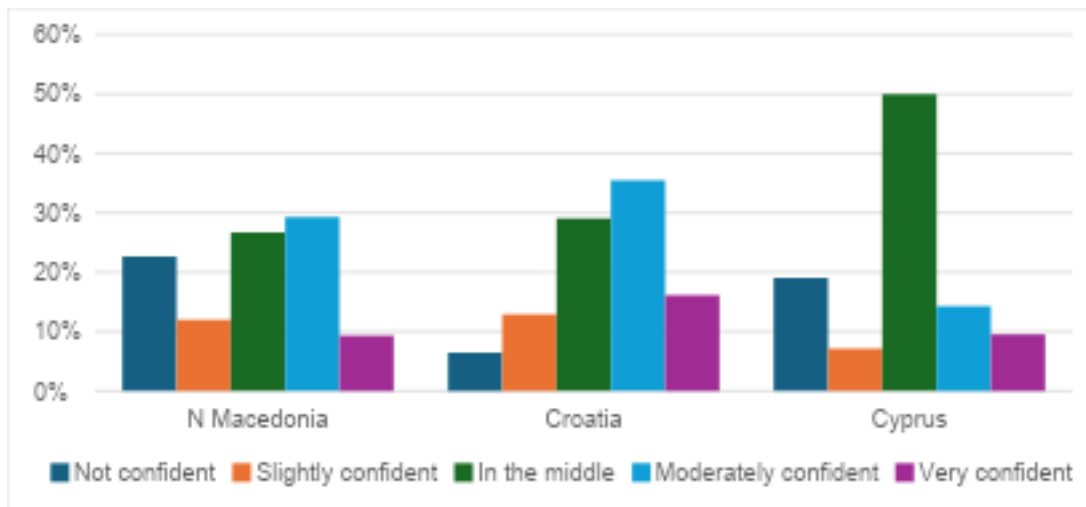


Figure 13. Confidence in Supporting Autistic Students during Nature-Based Activities

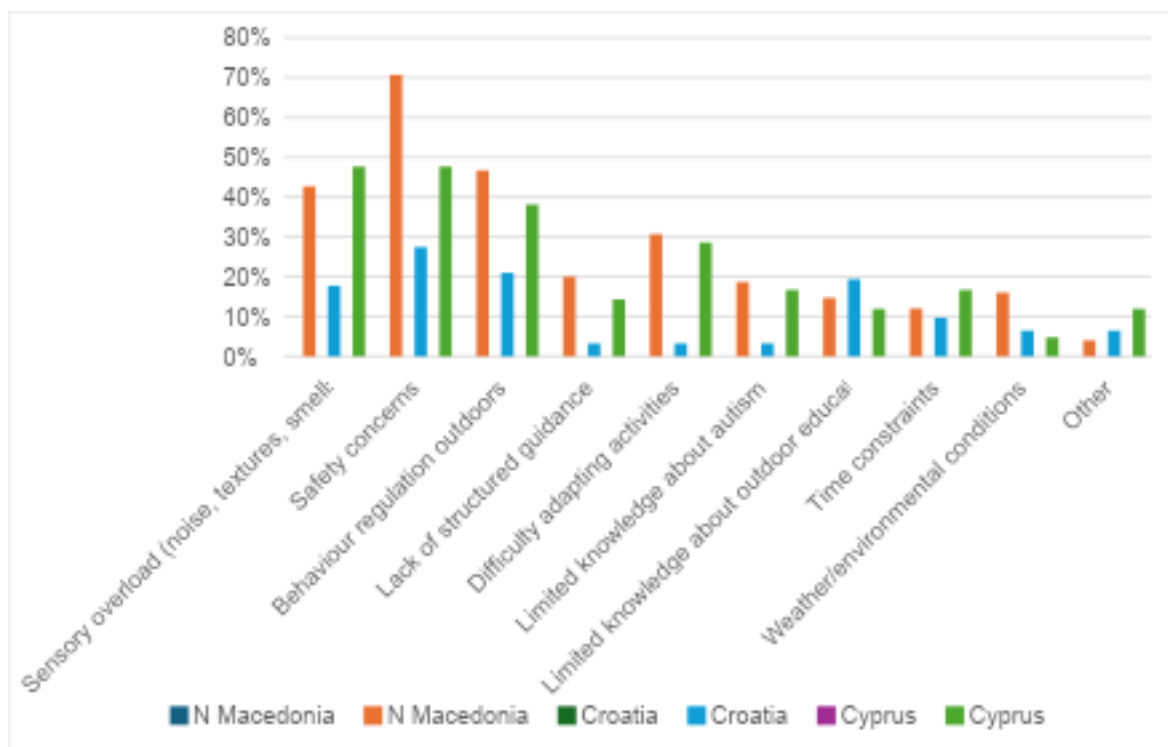


Figure 14. Barriers to Implementing Nature-Based Learning with Autistic Students

Figure 14 shows that educators across all three countries report a range of barriers when combining nature-based learning with autistic students, with safety and behavioural challenges emerging as the most significant concerns. In North Macedonia, the most prominent barrier is safety concerns (70%), followed by behaviour regulation outdoors (46%), sensory overload (42%), and difficulty adapting activities (30%). Other challenges, such as a lack of structure (20%) and limited knowledge about autism (18%), are also present. In Croatia, the most frequently reported barrier is behaviour regulation outdoors



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(approximately 64%), followed by emotional and behavioural challenges, while safety concerns and sensory issues are reported at lower levels compared to North Macedonia. In Cyprus, the main concerns include sensory overload (48%), safety concerns (48%), and behaviour regulation outdoors (38%), indicating a strong emphasis on environmental and behavioural challenges. Challenges such as limited knowledge about outdoor education, time constraints, and weather conditions are reported across all countries, but at lower levels. The “Other” category remains minimal, suggesting that the listed barriers capture the majority of concerns experienced by participants.

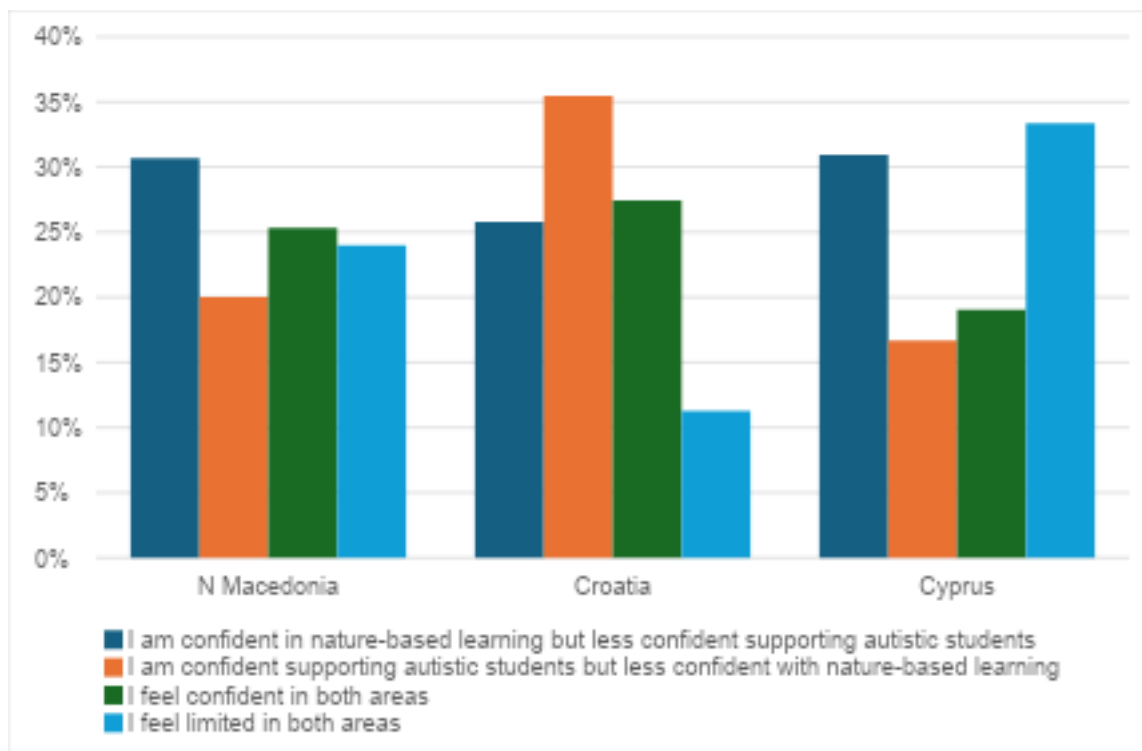


Figure 15. Self-Perception of Competence in Nature-Based Learning and Autism Support

Participants’ self-perceptions (**Figure 15**) reveal important differences in confidence between nature-based learning and supporting autistic students, with varying patterns across countries. In North Macedonia, the most common response is “I am confident in nature-based learning but less confident supporting autistic students” (30%), followed by “I feel confident in both areas” (25%) and “I feel limited in both areas” (24%), while fewer participants report being more confident in autism support than in nature-based learning (20%). In Croatia, the dominant response is “I am confident supporting autistic students but less confident with nature-based learning” (35%), followed by “I feel confident in both areas” (27%) and “I am confident in nature-based learning but less confident supporting autistic students” (26%), while fewer participants report feeling limited in both areas (11%). In Cyprus, the largest group reports “I feel limited in both areas” (33%), followed by “I am confident in nature-based learning but less confident supporting autistic students” (31%), while fewer participants report confidence in both areas (19%) or stronger confidence in autism support (17%). These findings show contrasting patterns: Croatia demonstrates



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stronger confidence in autism support, North Macedonia shows more confidence in nature-based learning, and Cyprus reflects greater overall limitations. Overall, only a minority of participants across all countries feel confident in both areas, indicating a gap in combined competencies required for effective, inclusive, nature-based education.

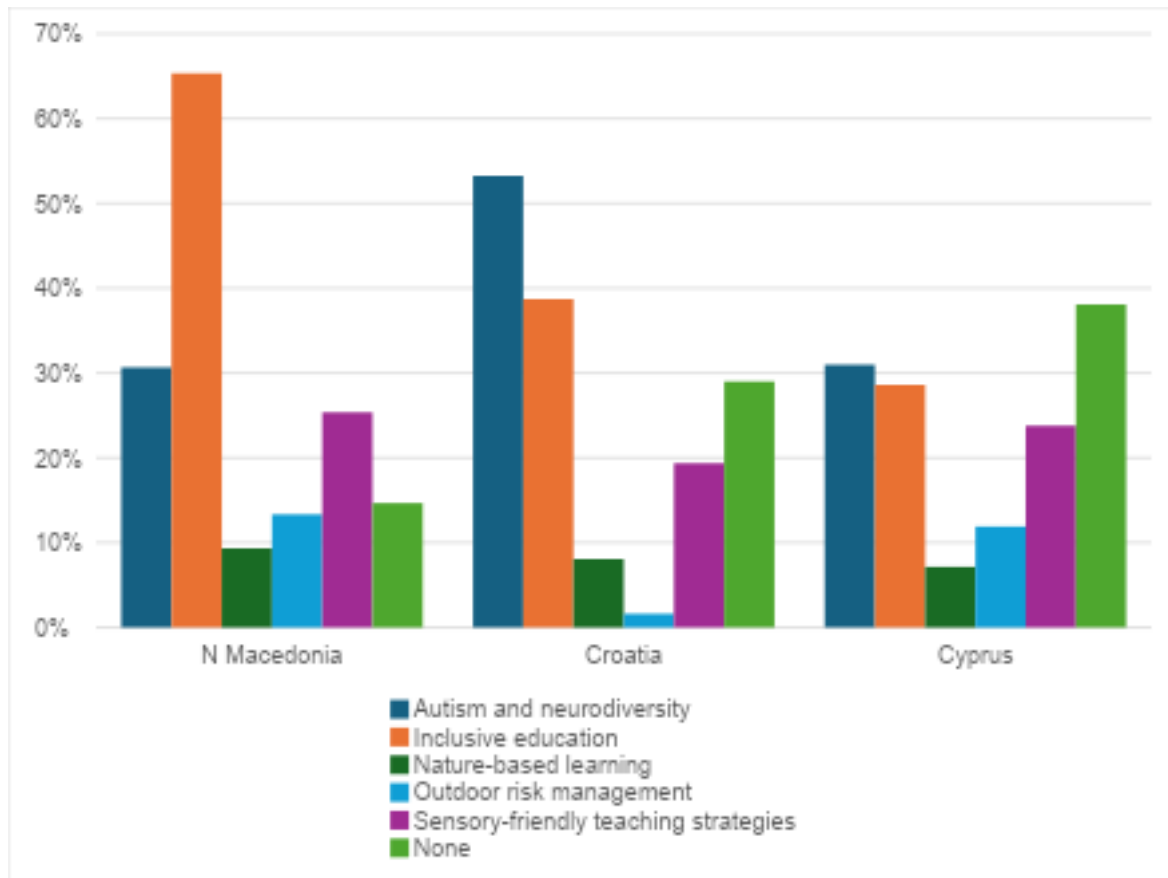


Figure 16. Formal Training in Inclusive, Autism, and Nature-Based Education

The results in **Figure 16** indicate varying levels of formal training across countries, with a strong emphasis on inclusive education and autism-related topics, while training in nature-based learning remains limited. In North Macedonia, the most common type of training is inclusive education (65%), followed by autism and neurodiversity (31%) and sensory-friendly teaching strategies (25%). Training in outdoor risk management (13%) and nature-based learning (9%) is less frequent, while 15% report no training. In Croatia, the highest proportion of participants reports training in autism and neurodiversity (53%), followed by inclusive education (38%) and sensory-friendly strategies (19%). Very few participants report training in outdoor risk management (2%) and nature-based learning (8%), while a notable proportion (29%) report no training. In Cyprus, training is more evenly distributed, with autism and neurodiversity (31%), inclusive education (28%), and sensory-friendly strategies (24%) being the most common. However, a relatively high proportion of participants (38%) report having received no formal training. Across all countries, training in nature-based learning and outdoor risk management is consistently low, indicating a gap in preparation for outdoor educational practices. Overall, the findings



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highlight a strong foundation in inclusive and autism-related education, but a clear lack of training in nature-based learning and outdoor safety.

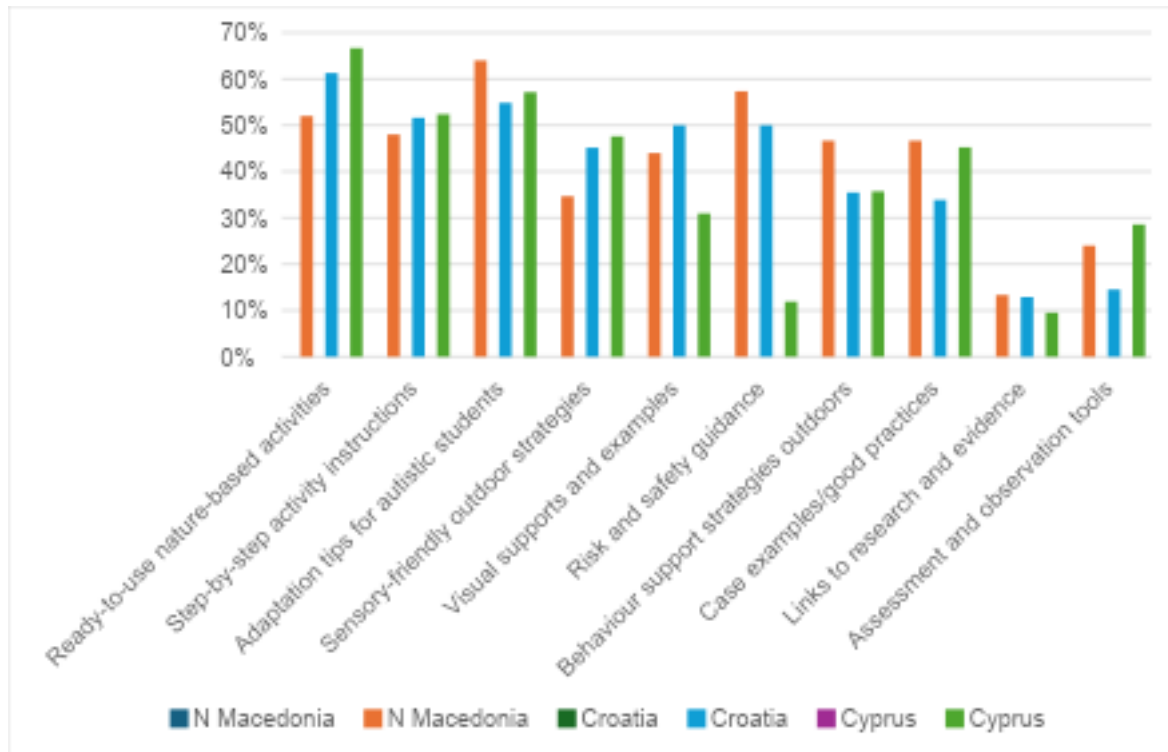


Figure 17. Needs and Preferences for a Teacher's Guide

Figure 17 shows that participants across all countries strongly prefer practical, ready-to-use resources that support the implementation of nature-based learning for neurodiverse students. In North Macedonia, the most valued resources are adaptation tips for autistic students (64%), risk and safety guidance (57%), and ready-to-use nature-based activities (52%), followed by step-by-step instructions (48%) and behaviour support strategies (46%). In Croatia, the highest priorities include ready-to-use activities (61%), adaptation tips (54%), and step-by-step instructions (51%), along with a strong interest in visual supports (45%) and sensory-friendly strategies (44%). In Cyprus, participants place the greatest emphasis on ready-to-use activities (67%), adaptation tips (57%), and sensory-friendly strategies (48%), while also highlighting case examples (45%) and step-by-step instructions (52%). Across all countries, links to research and evidence receive the lowest level of interest (around 10–13%), indicating that participants prioritise practical application over theoretical resources. Overall, the findings demonstrate a clear demand for structured, user-friendly, and immediately applicable materials that support both inclusive practices and outdoor learning.



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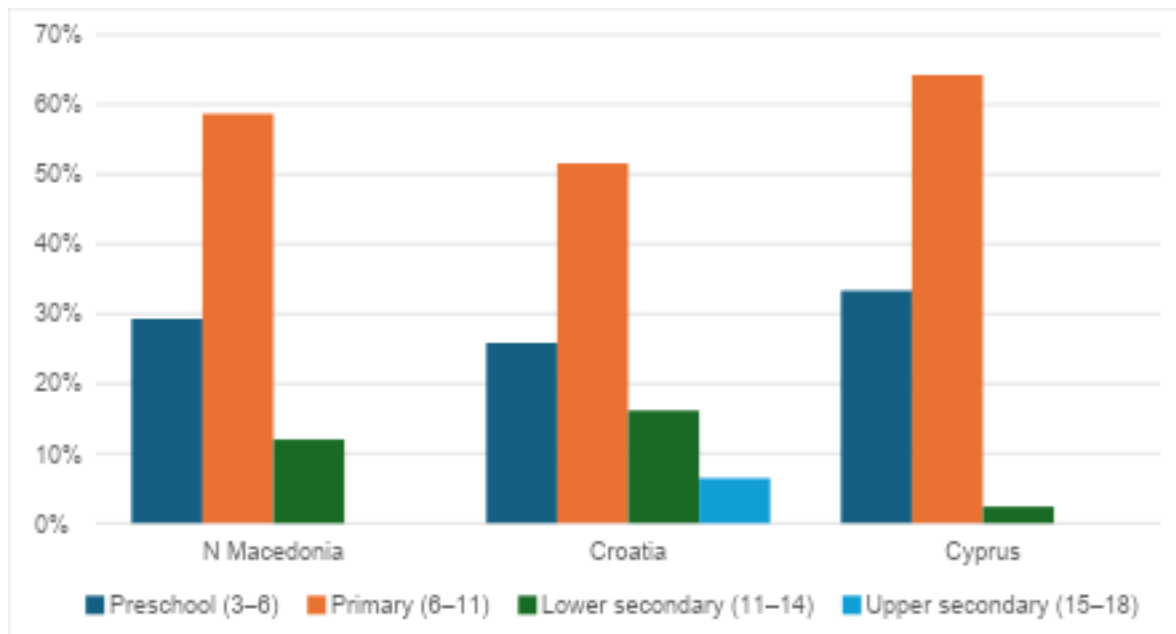


Figure 18. Preferred Age Groups for Implementing Nature-Based Activities

The results in **Figure 18** indicate a clear preference for focusing nature-based activities on younger age groups, particularly primary school students, across all three countries. In North Macedonia, the majority of participants prioritise primary education (59%), followed by preschool (29%), while fewer prioritise lower secondary (12%) and none prioritise upper secondary. In Croatia, primary education remains the most selected group (52%), followed by preschool (26%) and lower secondary (16%), with a small proportion indicating upper secondary (6%). In Cyprus, the emphasis on primary education is even stronger (64%), followed by preschool (33%), while very few participants select lower secondary (2%) and none select upper secondary. Across all countries, upper secondary education receives minimal attention, indicating that nature-based learning is primarily associated with early and middle childhood education. Overall, the findings suggest that educators perceive nature-based learning as most relevant and appropriate for younger learners, particularly at the primary level.

In **Figure 19**, Participants express a strong interest in including a wide range of activities, with a clear emphasis on developmental, social, and communication-focused approaches. In North Macedonia, the most preferred activities are social skills activities (70%), emotional regulation (48%), sensory regulation (49%), and communication-focused activities (51%), followed by physical activities (51%) and daily outdoor routines (37%). In Croatia, emotional regulation activities (65%) are the most desired, followed by communication-focused activities (55%), daily outdoor routines (54%), and social skills activities (48%), while sensory (35%) and creative activities (27%) are less emphasised. In Cyprus, the most preferred activities are social skills (64%), communication-focused activities (60%), sensory regulation (57%), and emotional regulation (54%), followed by physical activities (40%) and creative activities (40%). Across all countries, STEAM activities in nature receive comparatively lower interest (around 29–40%), indicating that participants prioritise developmental and social



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outcomes over academic or structured learning domains. Overall, the findings suggest that educators are primarily interested in activities that support social interaction, communication, and emotional development, rather than purely academic or content-based approaches.

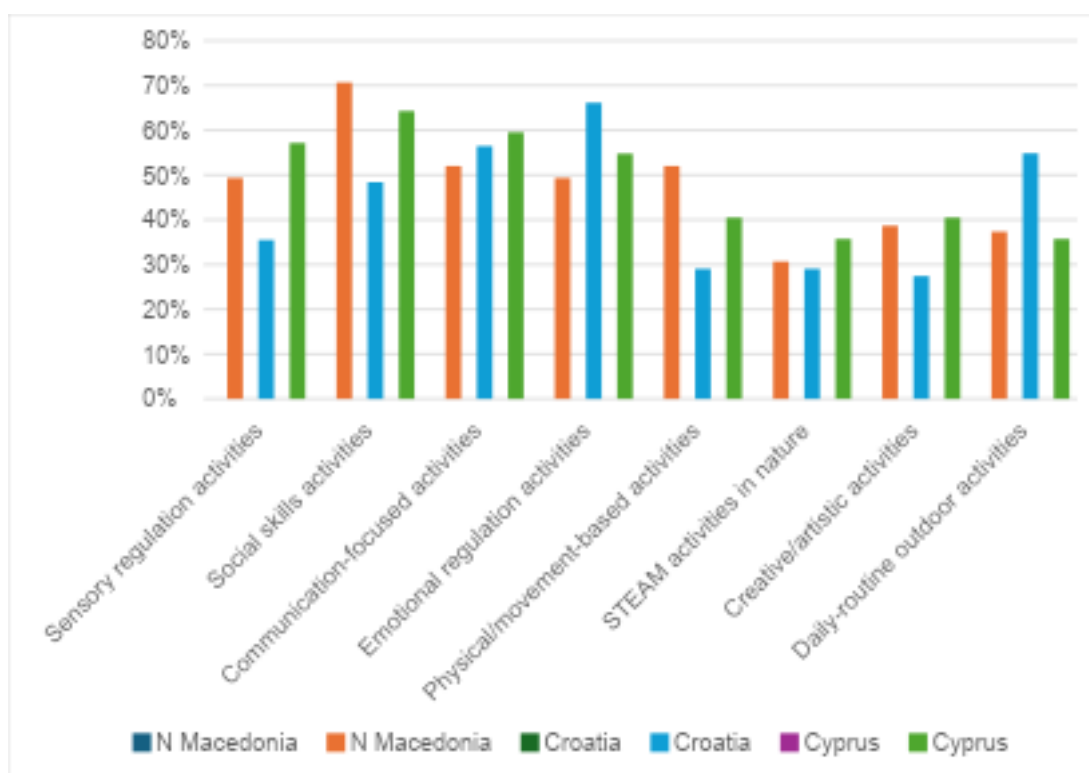
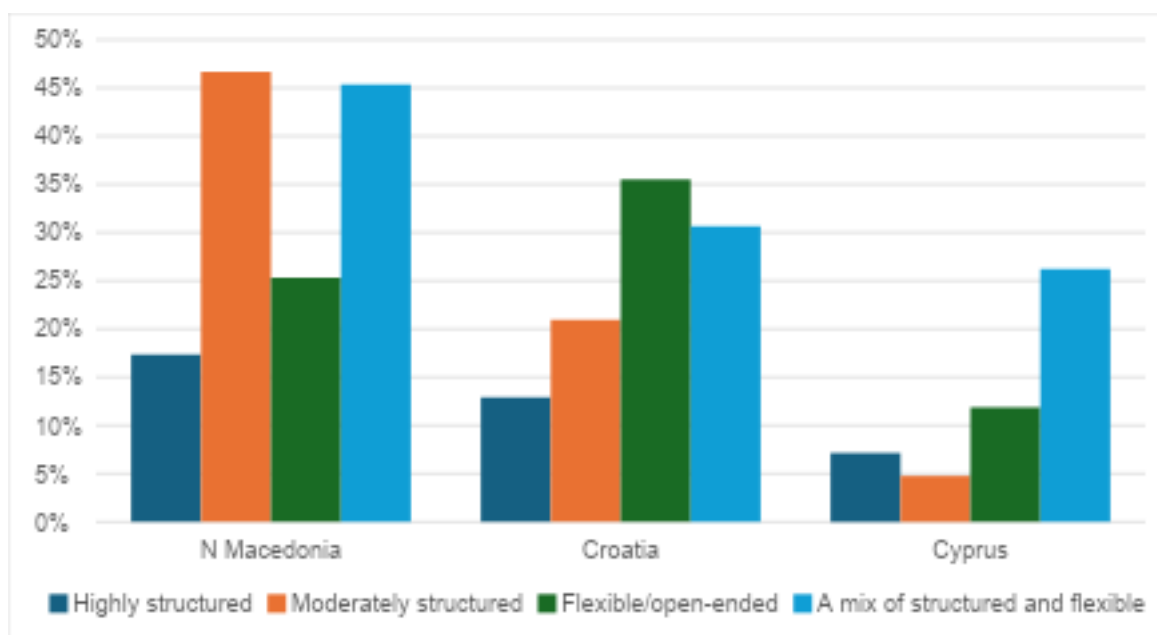


Figure 19. Preferred Types of Activities for Inclusion



20. Preferred Level of Structure in Nature-Based Activities

Participants' preferences for the structure of activities (**Figure 20**) indicate a clear tendency toward balanced, flexible approaches rather than strictly structured formats. In North Macedonia, the most preferred option is a mix of structured and flexible activities (45%), followed by moderately structured (47%) and flexible/open-ended approaches (25%), while fewer participants prefer highly structured activities (17%). In Croatia, the dominant preference is for flexible/open-ended activities (35%), followed by a mix of structured and flexible (30%) and moderately structured approaches (21%), with fewer participants selecting highly structured formats (13%). In Cyprus, the strongest preference is for a mix of structured and flexible activities (26%), followed by flexible/open-ended (12%), while highly structured (7%) and moderately structured (5%) approaches are less favoured. Across all countries, highly structured activities are the least preferred, indicating a general preference for adaptability and responsiveness to students' needs. Overall, the findings suggest that educators value a balanced approach that combines structure and flexibility, enabling them to adjust activities to context, environment, and student characteristics.

Challenges in Teaching Autistic Students Outdoors: Cross-Country Qualitative Analysis

A thematic analysis was conducted for each country separately. Responses were coded into categories, and frequencies represent the number of mentions per theme (multiple codes per response allowed).

Table 1. Challenges in Teaching Autistic Students Outdoors in N Macedonia

Theme	Description	Frequency (n)
Safety Concerns	General safety, supervision, risk during activities	3
Behavioural Challenges	Challenging behaviour, behaviour regulation	2
Emotional Regulation	Emotional control, reactions to stimuli	2
Communication and Social Skills	Communication difficulties, social interaction	1
Attention and Engagement	Maintaining attention, adapting activities	1
Staffing and Support Constraints	Lack of staff, need for parental support	2



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Theme	Description	Frequency (n)
Escape / Risk Behaviours	Running away, unsafe actions (e.g., putting objects in mouth)	2
Sensory Sensitivity	Reaction to noise and environmental stimuli	1
Spatial Awareness	Orientation in space	1
Monitoring and Instructional Challenges	Tracking progress, managing activities	2
Student Confidence	Low self-confidence	1

Summary – North Macedonia: Challenges are **multidimensional**, with emphasis on **safety, behavioural regulation, and lack of support/staff**, especially when working with students with complex needs.

Table 2. Challenges in Teaching Autistic Students Outdoors in Croatia

Theme	Description	Frequency (n)
Safety Concerns	Safety risks, unfenced spaces, supervision	9
Behavioural Challenges	Challenging behaviour, regulation difficulties	7
Escape / Elopement Risk	Running away, leaving space	4
Sensory Processing Difficulties	Sensory overload, environmental stimuli	4
Lack of Structure / Unpredictability	Unstructured environment, unpredictability	4
Lack of Training / Knowledge	No training, insufficient education	3
Staffing and Support Needs	Need for assistants, supervision challenges	2
Attention and Engagement	Difficulty focusing due to stimuli	1
Social Inclusion	Interaction with peers	2
Student Participation	Resistance, lack of engagement	2
Curriculum Gaps	Lack of structured curriculum	1

Summary – Croatia: Croatia shows **strong emphasis on safety and behavioural challenges**, combined with **environmental factors** (sensory overload, unpredictability) and a **lack of training**.

- **Environmental factors** (open spaces, noise, unpredictability)
- **Systemic factors** (training gaps, staffing shortages, lack of structure)

Table 3. Challenges in Teaching Autistic Students Outdoors in Cyprus

Theme	Description	Frequency (n)
Safety Concerns	General safety, supervision, boundaries	10
Behavioural and Emotional Regulation	Behaviour control, emotional regulation	4
Communication and Social Interaction	Communication, social interaction	4
Lack of Structure / Boundaries	Defining space, managing environment	3
Sensory Processing Difficulties	Sensory overload, unfamiliar stimuli	3
Adaptation to Change	Adjusting to new environments	2
Attention and Engagement	Focus, wandering behaviour	2
Training and Knowledge Gaps	Lack of knowledge	1
Organizational Constraints	Time, materials, resources	2



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Theme	Description	Frequency (n)
Student Motivation	Willingness to participate	1

Summary – Cyprus: Cyprus highlights **safety as the dominant concern**, alongside **communication, emotional regulation, and environmental adaptation challenges**.

Cross-Country Comparison (Key Patterns)

Most Dominant Themes Across All Countries

1. **Safety Concerns** (highest across all three countries)
2. **Behavioural Challenges**
3. **Escape / Risk Behaviours**
4. **Sensory and Environmental Challenges**

Country-Specific Patterns

- **North Macedonia** → Strong emphasis on **staffing limitations and complex needs**
- **Croatia** → Strong emphasis on **environmental unpredictability and lack of training**
- **Cyprus** → Strong emphasis on **structure, communication, and safety boundaries**

Overall Interpretation: Across all three countries, the findings demonstrate that challenges in outdoor learning for autistic students are shaped by three interacting dimensions:

- **Student-related factors** (behaviour, emotional regulation, sensory needs)
-

Safety emerges as the **central unifying concern**, influencing all other themes. The results indicate a clear need for:

- Structured guidance for outdoor learning
- Increased staffing and support
- Targeted training combining autism and nature-based education
- Strategies for managing risk, behaviour, and sensory environments

Results (Qualitative Comparative Analysis)

The comparative thematic analysis reveals both shared and country-specific patterns in the challenges educators face when supporting autistic students in outdoor or nature-based learning environments. Across all three countries, **safety concerns emerge as the most**

dominant theme, accounting for 17% of responses in North Macedonia, 23% in Croatia, and reaching the highest proportion in Cyprus (31%). This consistent pattern highlights safety as the primary barrier to implementing outdoor activities, particularly in less structured and open environments.

Behavioural challenges represent the second most frequently reported theme, particularly in Croatia (18%) and Cyprus (13%), and to a slightly lesser extent in North Macedonia (11%). These findings indicate that managing behaviour and ensuring appropriate responses in dynamic outdoor settings remain significant concerns for educators. Closely related to this, **escape or elopement risks** are notably present in North Macedonia (11%) and Croatia (10%), further reinforcing the importance of supervision and environmental control.

Environmental factors, including **sensory processing difficulties** and **lack of structure**, are consistently reported across all countries, with each accounting for approximately 9–10% of responses in Croatia and Cyprus, and lower but still present proportions in North Macedonia. These findings suggest that the unpredictable and stimulus-rich nature of outdoor environments poses challenges for students with sensory sensitivities and difficulties adapting to less structured settings.

In contrast, **system-level factors**, such as lack of training and staffing, appear less frequently but remain relevant, particularly in Croatia (training: 8%; staffing: 5%) and North Macedonia (staffing: 11%). These results indicate that while educators are primarily concerned with immediate, practical challenges (e.g., safety and behaviour), underlying structural limitations also contribute to the difficulties experienced.

Notably, **communication-related challenges** are more prevalent in Cyprus (13%) than in other countries, suggesting a greater emphasis on social interaction and communication needs in this context. Additionally, North Macedonia demonstrates a broader distribution of responses across categories, reflected in a higher proportion of less frequently coded themes, indicating more diverse or individualised challenges.

Overall, the findings demonstrate that challenges in implementing nature-based learning for autistic students are shaped by a combination of **student-related factors (behaviour, sensory needs)**, **environmental conditions (openness, unpredictability)**, and **systemic constraints (training, staffing)**. The dominance of safety across all contexts underscores the need for structured guidance, targeted training, and additional support mechanisms to enable educators to confidently and effectively conduct outdoor learning activities.

Additional Suggestions for the Teacher's Guide: Cross-Country Qualitative Analysis

Table 4: Additional Suggestions for the Teacher's Guide: Cross-Country Qualitative Analysis in CYPRUS

Theme	Description	Frequency (n)
Safety & Structure Guidelines	Clear rules, boundaries, safety procedures, quiet spaces	5
Visual Supports & Clarity	Visual schedules, simple instructions, structured guidance	4
Adaptation & Individualization	Activities adapted to individual needs and autism profiles	3

Theme	Description	Frequency (n)
Staffing & Support	Need for more staff, one-on-one assistance	2
Training & Knowledge	Need for training, lack of knowledge about autism	3
Practical Resources (Case Studies/Examples)	Examples, ready-to-use materials, case studies	2
Contextual Adaptation (Local Environment)	Adaptation to Cyprus nature (parks, forests)	1
Creativity & Engagement	Activities promoting creativity and “out-of-the-box” thinking	1
Parental Support	Parent counseling	1
General Positive Feedback	“Useful tool”, “Yes”	2
No Suggestions	Explicit “No” responses	5

Summary – Cyprus: Cyprus emphasises **safety, structure, and visual supports**, alongside the need for **training and individualised approaches**, with some respondents showing limited familiarity with autism.

Table 5: Additional Suggestions for the Teacher’s Guide: Cross-Country Qualitative Analysis in North Macedonia

Theme	Description	Frequency (n)
Co-Creation & Practitioner Involvement	Teachers want to contribute to guide development	2
Contextual Adaptation	Adaptation to national conditions and educational realities	1
Inclusive & Collaborative Learning	Teamwork and equal participation	1
Structured Guidance	Step-by-step instructions, timelines, structured activities	1
Sensory Support Strategies	Managing sensory overload, quiet zones	1
Training & Professional Development	Need for more training in autism and special education	2
Practical Examples	Real-life, everyday examples and applications	2

Summary – North Macedonia: North Macedonia highlights the importance of **practical, structured guidance, teacher involvement in design, and training**, with a strong focus on **real-world applicability**.

Table 6: Additional Suggestions for the Teacher’s Guide: Cross-Country Qualitative Analysis in Croatia

Theme	Description	Frequency (n)
Training & Education	More training for teachers and assistants	2
Practical Examples & Good Practice	Concrete examples, case-based learning, solutions	3
Structured Guidance	Step-by-step activities and structured support	1
Evidence-Based Resources	Use of up-to-date scientific knowledge	1
Resources & Materials	Need for materials and equipment	2
Outdoor Activities Focus	Emphasis on outdoor/nature-based activities	1
Safety Skills	Suggestion for self-defense training	1



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Summary – Croatia: Croatia strongly emphasises **practical, ready-to-use examples, training, and material resources**, with an additional focus on **evidence-based approaches**.

Cross-Country Comparison

Most Dominant Themes Across Countries

1. **Training & Professional Development**
 - o Present in all countries (strongest in Croatia and North Macedonia)
2. **Practical Examples & Ready-to-Use Materials**
 - o Highly emphasised in Croatia and North Macedonia
 - o Moderately present in Cyprus
3. **Safety & Structured Guidance**
 - o Strongest in Cyprus
 - o Present in Croatia and North Macedonia
4. **Adaptation & Individualization**
 - o Particularly emphasised in Cyprus and North Macedonia

Country-Specific Patterns

- **Cyprus** → Focus on **safety, structure, and visual supports**
- **North Macedonia** → Focus on **teacher involvement, practicality, and contextual relevance**
- **Croatia** → Focus on **evidence-based, concrete examples and training**

Overall Interpretation (Results Paragraph)

The qualitative analysis of educators' suggestions reveals a strong, consistent demand for **practical, structured, and applicable resources** for developing a Teacher's Guide for nature-based instruction. Across all three countries, participants emphasise the need for **training and professional development**, highlighting a gap between current practice and preparedness.

In Cyprus, the findings are dominated by a need for **clear structure, safety guidelines, and visual supports**, reflecting concerns about managing students in less predictable outdoor environments. In North Macedonia, participants place greater emphasis on **co-creation, contextual adaptation, and real-life applicability**, suggesting that the guide should reflect the realities of local educational systems and actively involve practitioners. In Croatia, the focus is strongly on **concrete examples, evidence-based practices, and material resources**, indicating a preference for highly practical, immediately usable content.

Overall, the results suggest that an effective Teacher's Guide should integrate **structured step-by-step guidance, real-world examples, training components, and adaptable strategies**, while also addressing safety, sensory needs, and inclusive practices. These findings reinforce the need for a **practice-oriented, flexible, and context-sensitive resource** that supports educators in implementing nature-based learning with neurodiverse students.



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Conclusion

The findings of this study reveal consistent patterns across North Macedonia, Croatia, and Cyprus, with educational contexts predominantly characterised by mainstream, public, and urban settings. While a high proportion of educators report working with autistic and other neurodiverse students, their confidence in supporting these students in outdoor or nature-based environments remains moderate, indicating a clear gap between experience and perceived competence.

Cross-country differences in professional roles and experience further shape implementation practices. Croatia demonstrates a higher reliance on teaching assistants, Cyprus reflects a highly experienced workforce, and North Macedonia shows a more balanced distribution of experience levels. Despite these differences, the use of nature-based activities remains inconsistent across countries, with most educators implementing them only occasionally and a notable proportion not using them at all.

Access to natural environments also varies, influencing the feasibility of outdoor learning. While Croatia reports high accessibility to green spaces, significant proportions of educators in North Macedonia and Cyprus face structural limitations, which may hinder regular implementation.



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Importantly, both quantitative and qualitative findings converge in identifying **safety as the central concern** across all contexts. Qualitative data highlight issues such as risk of elopement, lack of clearly defined boundaries, and the unpredictability of outdoor environments. These are closely followed by **behavioural challenges**, including difficulties with emotional regulation and managing unexpected reactions, as well as **sensory-related barriers**, such as overstimulation from noise and environmental stimuli. Additionally, educators report challenges including a **lack of structure**, difficulty maintaining attention, and the need for constant supervision.

Systemic constraints are also evident. Qualitative responses emphasise **insufficient training, lack of staff support**, and limited preparedness to manage complex needs in outdoor settings. In North Macedonia, educators particularly stress staffing shortages and the need for parental involvement for safety, while in Croatia, the lack of training and structured guidance is more prominent. In Cyprus, there is a stronger focus on the need for clear structure, visual supports, and communication strategies.

Furthermore, educators across all countries express a strong demand for **practical, ready-to-use resources**, reinforcing the quantitative findings. Qualitative data specify the need for step-by-step instructions, visual materials, case studies, and adaptable activities tailored to different levels of ability and local contexts. There is also a clear preference for resources that support **individualisation, flexibility, and real-world applicability**, rather than purely theoretical or research-based content.

Overall, the study highlights a systematic gap between educators' responsibilities and their preparation. While teachers are actively engaged in supporting neurodiverse students, they often lack the training, confidence, structural support, and practical tools necessary to effectively implement nature-based learning. This gap is shaped by an interaction of **student-related factors (behavioural and sensory needs), environmental conditions (unpredictability and openness), and systemic limitations (training, staffing, and resources)**.

The findings clearly indicate the need for the development of **integrated, practice-oriented training and resources** that combine:

- autism support
- inclusive education
- and nature-based learning

Such an approach should include structured guidance, safety protocols, adaptable strategies, and real-life examples, enabling educators to confidently and effectively support neurodiverse students in outdoor learning environments across diverse educational contexts.