2023-1-HU01-KA210-SCH-000152236 - Get Away From The Screens, Be With Nature: Play and Discovery in Children's Lives

Evaluation report of 3rd mobility

This evaluation report presents the results of the third mobility, “Mathematics in the Natural Environment,” which focused on exploring how mathematics can be taught in more meaningful, engaging, and practical ways by using the outdoor environment as a real learning space. The key objective of the programme was to support teachers in moving beyond classroom-based routines and in developing confidence to bring mathematical thinking into nature through measurement, observation, problem-solving, and creative activities using natural materials.

To assess participants’ needs and learning development, an input questionnaire was completed before the mobility and an output questionnaire was completed at the end of the programme. The evaluation is based on responses from 16 participants, providing a solid and consistent dataset for both quantitative and qualitative interpretation. This structure makes it possible to track clear shifts between baseline perceptions and end-of-mobility outcomes, while also capturing participants’ reflections on classroom challenges, professional development, and transferability into daily teaching practice.

Overall, this report aims to present a realistic and evidence-based picture of the mobility’s contribution, highlighting areas of measurable improvement as well as the practical relevance of the methods introduced during the programme.

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Question 1.

Input: "I am familiar with mathematics activities that can be carried out outdoors, in nature."

Output: "I apply outdoor mathematics learning methods with greater confidence."

The input questionnaire results indicate that, prior to the mobility, participants' familiarity with mathematics activities that can be carried out outdoors, in nature was moderate and clearly uneven across the group. All participants completed this item (16/16 responses), which provides a reliable baseline picture. The distribution of answers shows that only a minority of participants reported clear familiarity: 4 out of 16 respondents selected "Agree", while none selected "Strongly agree". In contrast, 7 out of 16 participants expressed a negative position at baseline (6 "Disagree" and 1 "Strongly disagree"), and 5 out of 16 selected "Neutral". This response pattern suggests that, before the mobility, outdoor mathematics was not yet a consistently established element of participants' pedagogical practice. Many respondents appeared to have only partial awareness of possible outdoor mathematics activities, or lacked confidence in identifying such tasks as part of their own method repertoire.

The output questionnaire reveals a very strong positive shift by the end of the mobility. Again, the full group responded to this item (16/16 responses), and the answers moved entirely into the positive range. In the output results, 8 participants selected "Agree" and 8 selected "Strongly agree", meaning that 100% of respondents (16/16) reported increased confidence in applying outdoor mathematics learning methods. Importantly, neutral and negative responses disappeared completely in the output survey (0 "Neutral", 0 "Disagree", 0 "Strongly disagree"), and the highest positive category, which was absent at baseline, appeared strongly after the mobility (8 "Strongly agree").

Comparing the input and output results, the data show a clear and measurable development aligned with the main educational purpose of the mobility: strengthening participants' capability to "take mathematics into nature" and use the natural environment as a meaningful learning space. The shift from a baseline where only 4 out of 16 participants agreed with the statement to an outcome where all 16 participants reported agreement or strong agreement highlights that the mobility supported the group not only in gaining awareness, but also in developing confidence to apply outdoor mathematics learning methods in practice. Overall, the results suggest that the mobility successfully contributed to building a shared level of competence and readiness among participants, moving from fragmented familiarity toward a confident and consistent perception of applicability.

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Question 2

Input: "I am confident in organising field measurement and data collection tasks (length, width, area, volume, etc.)."

Output: "I can plan field measurement, data collection, and graph-creation tasks more effectively."

The input questionnaire results show that, before the mobility, participants' confidence in organising field measurement and data collection tasks was generally limited and not yet stable across the group. All participants responded to this item (16/16 responses), providing a complete baseline dataset. At the start of the mobility, only 2 out of 16 respondents selected "Agree", while no one selected "Strongly agree". In contrast, 6 out of 16 participants expressed disagreement (5 "Disagree" and 1 "Strongly disagree"), and the largest share of the group (8 out of 16) selected "Neutral". This distribution indicates that, for most participants, field measurement and structured outdoor data collection were not areas of strong confidence at baseline. The high proportion of neutral responses suggests partial familiarity or occasional experience, but without the level of certainty required to confidently organise such tasks in practice.

The output questionnaire demonstrates a very strong improvement after the mobility. Again, all participants completed this item (16/16 responses), and the responses shifted fully into the positive categories. In the output results, 8 participants selected "Agree" and 8 selected "Strongly agree", meaning that 100% of respondents (16/16) reported that they could plan field measurement, data collection, and graph-creation tasks more effectively. Notably, all negative and neutral responses disappeared in the output questionnaire (0 "Neutral", 0 "Disagree", 0 "Strongly disagree"), and the "Strongly agree" category increased from 0 at baseline to 8 respondents by the end of the mobility.

When comparing the input and output results, the data point to a clear and measurable development aligned with the core objective of integrating mathematics into outdoor learning environments. The change is particularly significant because the baseline responses contained a high level of uncertainty: only 2 participants initially expressed agreement, while 14 out of 16 were either neutral or negative. By the end of the mobility, all participants reported positive development, showing a shift from limited confidence toward full-group readiness.

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Question 3

Input: "I am able to illustrate geometrical concepts (shapes, proportions, symmetry) using examples from nature."

Output: "I have learned new approaches for teaching geometry using natural materials."

The input questionnaire results indicate that, prior to the mobility, participants' perceived ability to illustrate geometrical concepts using examples from nature was relatively low and not evenly developed across the group. All participants responded to this item (16/16 responses), providing a complete baseline picture. At the start of the mobility, only 2 out of 16 participants selected "Agree", while none selected "Strongly agree". In contrast, 8 out of 16 respondents expressed disagreement (7 "Disagree" and 1 "Strongly disagree"), and 6 out of 16 selected "Neutral". This distribution suggests that, before the mobility, most participants did not yet feel confident in linking geometry to outdoor and nature-based examples in a structured way, and many perceived this area as unfamiliar or challenging.

The output questionnaire shows a clear and substantial positive shift following the mobility. Again, all participants completed this item (16/16 responses), and the results moved entirely into positive categories. In the output survey, 8 participants selected "Agree" and 8 selected "Strongly agree", meaning that 100% of respondents (16/16) reported having learned new approaches for teaching geometry using natural materials. Importantly, neutral and negative responses were completely absent in the output questionnaire (0 "Neutral", 0 "Disagree", 0 "Strongly disagree"), and the "Strongly agree" category, which was not present at baseline, became a dominant response after the mobility (8/16).

Comparing the input and output results, a strong and measurable improvement can be identified. The baseline results reflected considerable uncertainty, with only 2 participants agreeing and half of the group selecting negative responses. By the end of the mobility, all participants reported positive learning outcomes, suggesting that the programme provided practical and applicable methods for connecting geometrical concepts—such as shapes, proportions, and symmetry—to natural materials and outdoor observation.

Overall, the results indicate that the mobility was particularly effective in strengthening participants' ability to bring geometry into nature-based learning contexts, supporting the key project aim of making mathematics more tangible, visual, and experience-based through outdoor education.

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Question 4

Input: "I know how to develop mathematical problem-solving skills through practical, real-life situations."

Output: "My ability to design real-life, problem-solving mathematical tasks has improved."

The input questionnaire results show that, prior to the mobility, participants' perceived ability to develop mathematical problem-solving skills through practical, real-life situations was mixed and not fully stable across the group. All participants responded to this item (16/16 responses), providing a complete baseline dataset. At the beginning of the mobility, 5 out of 16 participants selected "Agree", while none selected "Strongly agree". At the same time, 7 out of 16 respondents expressed a negative position (6 "Disagree" and 1 "Strongly disagree"), and 4 out of 16 selected "Neutral". This distribution suggests that a part of the group already felt some confidence in connecting problem-solving skills to real-life contexts, but a larger proportion were either uncertain or did not yet perceive themselves as competent in doing so consistently.

The output questionnaire results indicate a strong improvement by the end of the mobility, although one response was missing for this item. In the output dataset, 15 participants provided an answer (15/16 responses), and the distribution moved entirely into positive categories. Among the 15 respondents, 9 selected "Agree" and 6 selected "Strongly agree", meaning that all respondents (15/15) reported that their ability to design real-life, problem-solving mathematical tasks had improved. No neutral or negative responses were recorded in the output questionnaire for this item (0 "Neutral", 0 "Disagree", 0 "Strongly disagree").

Comparing the input and output results, the data point to a clear positive development aligned with the mobility's focus on applying mathematics in authentic outdoor contexts. At baseline, only 5 participants selected agreement, while 11 out of 16 were either neutral or negative. After the mobility, the results show a complete shift toward positive self-assessment among respondents, with 15 out of 15 indicating improvement. The presence of "Strongly agree" responses in the output results (6/15), combined with the disappearance of negative responses, suggests that the mobility helped participants strengthen their competence in designing real-life mathematical problem-solving tasks in a more structured and confident manner, supporting meaningful transfer into outdoor and nature-based learning environments.

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Question 5

Input: "I am confident in planning activities that combine mathematics with games and creative use of natural materials."

Output: "I have a better understanding of how to make mathematics an engaging, creative, and playful subject."

The input questionnaire results indicate that, prior to the mobility, participants' confidence in planning activities that combine mathematics with games and the creative use of natural materials was generally limited and not yet consolidated across the group. All participants responded to this item (16/16 responses), providing a complete baseline dataset. At the start of the mobility, only 2 out of 16 participants selected "Agree", while none selected "Strongly agree". In contrast, 6 out of 16 respondents expressed disagreement (5 "Disagree" and 1 "Strongly disagree"), and the largest proportion of the group (8 out of 16) selected "Neutral". This distribution suggests that most participants were either uncertain or did not yet feel fully confident in designing playful, game-based mathematics activities in natural outdoor settings, even if they were open to the idea

The output questionnaire demonstrates a very strong positive shift after the mobility. Again, all participants answered this item (16/16 responses), and the responses moved entirely into positive categories. In the output results, 8 participants selected "Agree" and 8 selected "Strongly agree", meaning that 100% of respondents (16/16) reported a better understanding of how to make mathematics engaging, creative, and playful. Importantly, all neutral and negative responses disappeared in the output questionnaire (0 "Neutral", 0 "Disagree", 0 "Strongly disagree"), and the "Strongly agree" category, which was not present at baseline, became a key part of the post-mobility outcome (8/16).

Comparing input and output results, the data show a clear and measurable development that strongly aligns with the mobility's thematic focus. While at baseline only 2 participants expressed agreement and the majority of responses were neutral or negative (14 out of 16), the output results confirm full-group positive progress. The shift from limited initial confidence to 16 out of 16 participants reporting improved understanding suggests that the mobility successfully provided participants with applicable ideas and approaches for combining mathematics, play, and creativity in nature-based learning environments.

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Question 6

Input: "How would you address the situation if students have difficulty understanding conversions between units of measurement?"

Output: "What percentage of the methods learned during the mobility do you plan to integrate into your teaching practice?"

The input questionnaire results show that all participants responded to this open-ended question (16/16), which indicates that the topic of unit conversion difficulties was recognised as a relevant and common challenge in mathematics education. The written answers reflect that participants were able to describe practical and pedagogically appropriate ways of supporting students when they struggle with conversions between units of measurement. Although the responses were expressed in different styles, the baseline answers generally focused on step-by-step explanation, repeated practice, using concrete examples, and supporting understanding through visual or hands-on activities. This suggests that, even before the mobility, participants were able to identify realistic classroom approaches and were already aware that unit conversions require structured guidance, clear sequencing, and frequent connection to real-life contexts

At the same time, the input responses also imply that unit conversion is perceived as an area that often requires additional instructional tools beyond standard explanation. The fact that all participants engaged with the question supports the interpretation that participants had meaningful baseline experience with this issue, but also recognised that their students may regularly struggle with it, especially when conversions are taught in a purely abstract way without practical application.

The output questionnaire shifts from a specific pedagogical challenge to a direct measurement of implementation intention. In the output results, all participants answered this question as well (16/16), and each respondent provided a concrete percentage estimate regarding how much of the mobility's methods they plan to integrate into their teaching practice. This provides measurable evidence that participants were able to reflect on the practical transferability of what they learned and assess its relevance to their own educational contexts. Unlike the input question, which captures immediate classroom-level responses to student difficulties, the output question captures the extent to which participants see the mobility content as usable and applicable in real teaching settings.

Comparing the input and output results, a coherent progression can be observed. The input answers highlight that participants already had general strategies to support unit conversion learning, but these are typically framed as standard instructional techniques. The output results, through the presence of 16/16 quantified implementation responses, suggest that the mobility provided participants with additional structured methods that they consider transferable into practice.

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Question 7

Input: "What would you do if students are not motivated to engage in outdoor mathematics activities?"

Output: "Which nature-based mathematics methods will you apply first?"

The input questionnaire results show that all participants responded to this open-ended question (16/16), indicating that lack of motivation toward outdoor mathematics activities is perceived as a realistic and relevant classroom challenge. The written responses suggest that participants were already aware that outdoor learning, even when designed as a playful and practical approach, may not automatically lead to full engagement. At baseline, the answers generally reflected practical strategies for increasing students' willingness to participate, such as introducing outdoor mathematics gradually, explaining the purpose of the activity in a clear and relatable way, and creating a motivating atmosphere through teamwork, games, and active involvement. Many responses implied that students may need encouragement and structure, especially when outdoor mathematics is unfamiliar or when learners have low confidence in mathematics-related tasks.

Overall, the input results indicate that participants entered the mobility with a clear understanding that motivation is a key success factor in nature-based mathematics learning. The baseline answers mainly focus on how to handle the situation through supportive facilitation, positive reinforcement, and adapting tasks to the needs and interests of the group. This suggests that even before the mobility, participants were able to identify realistic pedagogical approaches for improving engagement, but these strategies were typically described in general terms rather than as part of a structured set of nature-based mathematics methods.

The output questionnaire shifts the focus from managing motivation challenges to concrete implementation planning. In the output results, all participants answered the question (16/16) on which nature-based mathematics methods they would apply first. This indicates that by the end of the mobility participants were able to identify specific approaches they consider transferable and immediately applicable in their own practice. Instead of describing what they would do when students are unmotivated, participants moved toward naming priority methods and deciding on first steps for outdoor mathematics implementation.

Comparing the input and output perspectives, a coherent progression can be observed. The input responses highlight baseline classroom strategies for addressing low motivation in outdoor mathematics activities, while the output responses demonstrate readiness for practical application by selecting initial nature-based methods to introduce. This suggests that the mobility supported participants in moving from general facilitation and motivational thinking toward clearer planning and prioritisation of outdoor mathematics methods, strengthening the overall potential for meaningful transfer into real teaching contexts.

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Question 8

Input: "What challenges do you currently experience in teaching mathematics?"

Output: "To what extent did the mobility contribute to your professional development?"

The input questionnaire results show that all participants responded to this open-ended question (16/16), which confirms that every respondent was able to identify and articulate challenges related to teaching mathematics in their everyday practice. The answers provide a baseline picture of the main difficulties educators face when teaching mathematics, offering context for the mobility's focus on making mathematics more practical, engaging, and transferable to outdoor learning environments. The fact that the full group responded highlights that the topic was highly relevant and directly connected to participants' real teaching experiences

Although the input question is broad, it captures essential baseline challenges that can affect the success of mathematics teaching. The responses indicate that participants already perceived mathematics education as an area where student motivation, conceptual understanding, and practical application can be difficult to manage. In particular, the question allows participants to express obstacles they face in supporting students' understanding and engagement, which is a key reason why teaching mathematics in nature-based contexts can be valuable: it can connect abstract mathematical ideas to real-life experiences and hands-on learning.

The output questionnaire shifts the focus from describing baseline challenges to reflecting on professional development outcomes. In the output dataset, all participants answered the question (16/16) asking to what extent the mobility contributed to their professional development. This confirms that each participant was able to evaluate the mobility's impact and perceived learning value. While the input question highlights what participants struggled with before the mobility, the output question captures how the programme supported them in strengthening their professional competence and readiness.

Comparing the input and output perspectives, a coherent evaluation narrative emerges. The input responses provide a needs-based starting point by identifying practical challenges in mathematics teaching, while the output responses reflect participants' perceived development after taking part in the mobility. Together, the two questions support the conclusion that the mobility addressed relevant professional needs and contributed to enhancing participants' skills, methodological awareness, and confidence in developing more engaging, real-life, and nature-based mathematics learning experiences.

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Question 9

Input: "What expectations do you have regarding the mobility in Greece?"

Output: "From your perspective, what was the most significant professional and pedagogical outcome of the programme?"

The input questionnaire results show that all participants answered this open-ended question (16/16), indicating that every respondent entered the mobility with clearly formed expectations and a strong level of engagement. This question provides an important baseline, as it captures what participants hoped to gain from the mobility in Greece before the programme started. The fact that all participants responded suggests that the mobility was perceived as meaningful and relevant already at the preparation stage, and participants were able to articulate their learning intentions in advance.

Although the input responses are qualitative, they function as a clear reference point for evaluating outcomes. Expectations expressed before the mobility typically reflect participants' professional needs and interests, and they highlight areas where participants were seeking new ideas, methods, inspiration, or practical tools. In the context of this mobility, which focused on mathematics in the natural environment, the input expectations provide valuable insight into what participants considered important—such as improving teaching methods, strengthening confidence in outdoor mathematics activities, or gaining transferable practices that could be implemented in their own educational settings.

The output questionnaire shifts from anticipated benefits to reported results. In the output dataset, all participants also answered this question (16/16) regarding the most significant professional and pedagogical outcome of the programme. This confirms that participants were able to reflect on the programme's value and identify at least one key outcome they considered professionally meaningful. Unlike general satisfaction questions, this item captures concrete perceived achievements in participants' own words, providing qualitative evidence of impact.

Question 10.

Output: "From your perspective, what was the most significant professional and pedagogical outcome of the programme?"

The output questionnaire results show that all participants answered this open-ended question (16/16), indicating that every respondent was able to identify and articulate at least one key outcome that they considered professionally and pedagogically meaningful. This is an important indicator of impact, as the question requires reflective evaluation rather than a simple agreement-based response. The complete response rate confirms that the programme outcomes were visible and relevant enough for all participants to form a clear opinion about what the most significant achievement of the mobility was.

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Although this is a qualitative question and does not provide a numerical rating scale, the responses still offer strong evidence of learning value and professional relevance. Participants' answers demonstrate that the mobility supported them not only in gaining new ideas, but also in recognising concrete development in their pedagogical approach. In the context of "Mathematics in the Natural Environment," this question is particularly significant because it captures how participants summarise the programme's contribution in relation to real teaching needs: making mathematics more practical, engaging, and transferable to nature-based learning settings.

Overall, the fact that 16 out of 16 participants responded to this final reflective item strengthens the evaluation narrative by confirming that the mobility produced identifiable professional learning outcomes. The responses indicate that the programme achieved more than short-term participation and contributed to participants' pedagogical development in a way that they perceived as meaningful and applicable in their future teaching practice.

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Summary

The results of the input and output questionnaires clearly indicate that the third mobility had a strong and positive impact on participants' confidence and readiness to teach mathematics through outdoor, nature-based approaches. Across the Likert-scale questions, the data show a consistent shift from uncertainty and uneven baseline familiarity toward full-group positive outcomes. In Questions 1–5, participants started with a mix of neutral and negative responses, particularly in areas such as outdoor mathematics familiarity, field measurement and data collection, nature-based geometry teaching, and planning playful or creative mathematics activities. By the end of the mobility, the results moved decisively into the positive range, with participants consistently reporting improved confidence, stronger understanding, and clearer competence in applying the methods in practice.

The qualitative sections further strengthen this evaluation. All open-ended questions were answered by all participants (16/16), demonstrating high engagement and strong relevance of the programme themes. Participants were able to reflect on real classroom challenges, including difficulties with unit conversions, motivation issues, and broader barriers in everyday mathematics teaching. In addition, the output questionnaire confirms that participants left the mobility not only with general inspiration but also with a concrete implementation mindset: they identified which nature-based methods they plan to apply first, listed techniques they intend to integrate immediately, and evaluated the programme's contribution to their professional development.

Overall, the evaluation results support the conclusion that this mobility successfully achieved its core goal: strengthening teachers' ability to bring mathematics into real-life contexts, using the natural environment to make mathematical learning more practical, engaging, and experience-based. The progress reflected in the data is clear and measurable, while still realistic, making this mobility a particularly valuable step in building sustainable outdoor mathematics competence among participants.

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