SpicE

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WP4 Pilot Testing and Evaluation

D4.3 Upscaling Guidelines

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Executive Summary

This deliverable presents the Upscaling Guidelines for the SpicE Training Programme, offering strategic, evidence-based recommendations to support the broader implementation of inclusive STEAM education across diverse educational settings. Developed through a comprehensive synthesis of survey data, focus group discussions, and previous evaluation findings (notably from Deliverable 4.2 Unified Evaluation Report), the report provides a practical framework for educators, institutions, and policymakers aiming to adopt or adapt the SpicE training programme.

The programme was designed to strengthen the professional competences of pre-service and in-service teachers in incorporating inclusive STEAM education in their teaching practice. Structured across three progressive phases—a Massive Open Online Course (MOOC), a blended learning programme, and a teacher mobility programme—SpicE combines foundational theory, collaborative learning, and practical classroom application.

Findings from both quantitative and qualitative data confirm the relevance, adaptability, and impact of the training. Participants consistently valued this multi-format structure, particularly its strong emphasis on peer exchange, intercultural dialogue, and experiential learning. However, cross-national variation in responses highlighted the importance of further contextualisation to accommodate specific policy environments, educational structures, and teacher needs.

To support effective upscaling, the deliverable introduces a SWOT-based recommendation framework, which synthesises the programme's internal strengths and challenges alongside external opportunities and threats. Key insights include:

- The need to maintain practical application through adaptable resources, ready-to-use lesson plans, and localised examples.
- Ensuring coherence and flexibility in delivery by linking learning activities across phases and accommodating diverse participant profiles.

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- Addressing institutional and systemic barriers by aligning training goals with national curricula, forming partnerships with stakeholders, and exploring sustainable funding mechanisms.
- Investing in trainer capacity through train-the-trainer actions and follow-up structures to ensure quality delivery at scale.

The SWOT-based recommendations are structured in a 4x4 grid that synthesizes these findings into a concise, actionable format. This tool is intended to guide institutions and stakeholders in the strategic planning and implementation of the SpicE training programme across new educational contexts. It highlights critical areas to preserve, adapt, and monitor, offering a roadmap for upscaling the programme. Overall, this deliverable underscores that successful upscaling is not a matter of replication, but a strategic process of adaptation—grounded in local realities, supported by structured resources, and driven by a shared commitment to inclusive, student-centred education.

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1. Introduction

This deliverable (Upscaling Guidelines for the SpicE Training Programme), aims to provide structured, evidence-based recommendations for optimising and expanding the implementation of the programme beyond its pilot phase, across diverse educational contexts. The deliverable focuses on both the optimisation and the upscaling of the SpicE training programme. Optimisation refers to refining the design, content, and delivery mechanisms of the training based on participant feedback and evaluation results, while upscaling addresses the broader institutional, systemic, and infrastructural factors needed to expand the programme.

Insights derived from a synthesis of data from post-training surveys and focus group discussions, as well as the evaluation data from the D4.2 Unified Evaluation Report. The actionable guidelines and recommendations are structured in a SWOT grid format, which serves as a practical tool for institutions, policymakers, and educators aiming to incorporate the SpicE training programme in new contexts.

The deliverable opens with a brief overview of the SpicE training programme, followed by a short literature review on upscaling of educational initiatives to frame the conceptual foundations of the work. This is followed by a methodology chapter detailing the tools, procedures, and data analysis processes employed. The subsequent chapters present the findings of the analysis and the resulting recommendations for scaling and adapting the training.

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2. The SpicE training programme

The SpicE training programme was designed to equip both in-service and pre-service teachers with the competences, strategies, and tools needed to implement inclusive STEAM education in classrooms that include learners with mild disabilities (see D2.1 GAP Analysis, University of Macedonia, 2023, for more details). The training programme builds on the Joint STEAM Curriculum in Special Education (see Pavlou et al., 2023, for more details). The Curriculum structure is designed to be flexible, allowing adaptation based on teachers' background knowledge and professional experience. It was developed through a three-phase methodology:

1. **Phase 1: Identification of Teachers' Needs** – An analysis of the educational needs of teachers in inclusive STEAM education, informed by research and prior findings from D2.1 (University of Macedonia, 2023).
2. **Phase 2: Selection of Teacher Competences** – Alignment of these needs with specific competences required for inclusive STEAM educators, based on the SpicE Competence Framework (Sakellaropoulou et al., 2023).
3. **Phase 3: Internal Review and Refinement** – An iterative process to refine the curriculum before finalization.

The training programme, focuses on systematically building teachers' knowledge and competences in fostering key inclusive STEAM educator competences, as defined in the D2.2 *STEAM Educator Competence Framework and Profiles for Special Needs* (Sakellaropoulou et al., 2023). It follows a three-phase learning pathway, ensuring progressive development of teachers' knowledge and skills:

1. **MOOC (Massive Open Online Course)** – A five-week online course designed to introduce teachers to STEAM, inclusive education, and their intersection. The course structure includes self-paced modules, community discussions, and formative assessments.
2. **Blended Learning Programme** – A five-week course integrating synchronous and asynchronous sessions, targeting the needs of pre-service and in-service teachers in two distinct learning pathways. The content is adapted to different

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teaching contexts, with a focus on inclusive STEAM strategies and instructional design.

3. **Teacher Exchange Programmes** – Mobility training sessions hosted in Cyprus and Spain, where selected teachers participate in in-person workshops to refine their STEAM teaching practices and be introduced to country-based practices.

The SpicE training programme provides a structured yet adaptable foundation for fostering inclusive STEAM education. By combining online learning, blended engagement, and in-person interaction, it supports the development of essential teaching competences while allowing for contextual flexibility. The following chapter introduces the concept of upscaling, which will serve as the basis for exploring how this training programme can be effectively expanded and adapted to broader educational settings.

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3. Upscaling the SpicE training programme: Insights from the literature

The concept of upscaling has emerged as a pivotal consideration in the field of educational innovation, particularly in efforts to transition pilot initiatives into sustainable, system-wide practices. Upscaling encompasses both quantitative expansion, such as increased participation, and qualitative development, including contextual adaptation, pedagogical refinement, and institutional integration (Buhl et al., 2018; Garcés & O'Dowd, 2021; Hassler et al., 2018). It is a multidimensional process requiring strategic alignment across various educational layers and actors.

Research underscores the importance of viewing upscaling as both a horizontal and vertical process. Horizontal expansion extends the reach of a programme across institutions and geographies, while vertical deepening embeds it within institutional routines, policies, and cultures (Newman et al., 2017). For initiatives like the SpicE project, which aim to promote inclusive STEAM education across Europe, this dual perspective is essential to ensure fidelity to pedagogical goals while remaining responsive to diverse educational settings.

However, the literature also highlights significant challenges inherent to upscaling. These include fragmentation of roles in large-scale digital programmes, which can erode pedagogical coherence; institutional inertia, characterised by rigid curricula and limited incentives; and quality assurance issues as programmes grow (Buhl et al., 2018; Garcés & O'Dowd, 2021). Moreover, there is a persistent risk of superficial adoption, where pedagogical practices are mimicked without meaningful professional learning, ultimately undermining long-term impact (Hassler et al., 2018; Newman et al., 2017).

Various models offer insights into effective upscaling strategies. MOOCs, for instance, demonstrate how scale can be rapidly achieved through flexible and accessible online delivery. However, they often struggle with learner engagement, which can be mitigated through structured peer interaction, adaptive technologies, and community-building mechanisms (Buhl et al., 2018). Blended learning approaches, which combine

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online content with localised, collaborative engagement, are particularly valuable for upscaling. Embedding professional development within educators' existing routines, such as through school-based learning activities or integrated mentoring, can foster stronger ownership and relevance. Peer facilitation and structured flexibility further support sustainable implementation, enabling participants to adapt materials to their contexts while maintaining a shared pedagogical vision. Such embedded approaches enhance both scalability and long-term impact by aligning training with everyday practices and institutional structures (Garcés & O'Dowd, 2021; Hassler et al., 2018).

Furthermore, research increasingly calls attention to the importance of ongoing evaluation and participatory feedback loops to maintain relevance and responsiveness during scale-up processes. These mechanisms allow for timely adaptation and help ensure that innovations remain contextually meaningful and pedagogically robust (Buhl et al., 2018; Hassler et al., 2018). Equally, issues of equity and access are paramount, necessitating inclusive design features such as multilingual resources, offline accessibility, and open licensing to reach marginalised communities and support long-term reuse (Hasler & Mays, 2015).

Taken together, the literature suggests that successful upscaling is not a linear replication of best practices, but a dynamic, context-sensitive process. It demands a careful balance between fidelity and flexibility, structure and autonomy, and innovation and institutionalisation.

For this deliverable, upscaling is conceptualised not only as a process of expanding the reach of the SpicE training programme, but also as a structured effort to embed its core pedagogical elements within diverse educational systems. The deliverable builds on this conceptual foundation: it outlines the methodology used to gather empirical data from participants during all phases of the training, presents key findings, and concludes with a set of practical guidelines and recommendations, synthesised through a SWOT-based framework, for institutions and educators seeking to adopt or adapt the SpicE training programme in new contexts.

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4. Methodology

To ensure a comprehensive evaluation of the SpicE training program, particularly in developing practical guidelines for its enactment, multiple data collection methods were employed. These methods were designed to capture diverse perspectives and experiences from participating teachers at different stages of the SpicE training program. A mixed-methods approach, integrating both qualitative and quantitative analyses, was used to obtain a well-rounded understanding of the program's adaptability to different educational contexts and to identify opportunities for further development and scalability. In this chapter, the data collection tools and procedures, as well as the methods of data analysis used, will be presented in detail.

4.1. Data collection process and tools

Two types of tools were used to collect information from participants regarding the upscaling of the SpicE training program: (i) post-surveys, and (ii) focus groups. As shown in the table below, the tools were administered at different stages of the SpicE training program. The triangulation of these data sources supports evidence-based recommendations for the continued refinement and expansion of the program.

Table 1. Data collection tools for each phase of the SpicE training program

Phase of the SpicE training program	**Phase 1: Mooc**	**Phase 2: Blended learning program**	**Phase 3** **Phase 3: Exchange programs**	
			Exchange program in Spain	Exchange program in Cyprus
Evaluation tool	Post-survey Focus group (upon completion)	Post-survey Focus group (upon completion)		Focus groups (upon completion)

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Two post-surveys were administered following the completion of the MOOC and blended learning programme respectively, in which all participants were called to complete anonymously and voluntary. Complementing the survey data, focus groups discussions were organised to enable more in-depth discussions on teachers' experiences and perceptions after the MOOC (23 October 2024) and Blended learning program (13 December 2024) respectively. The first focus group emphasized on insights from the MOOC, while the second concerned the blended learning program. An open call was set to all participants upon successful completion of each training phase and a small number of participants was selected to form a focus group to discuss and reflect on their experience, as well as to clarify and enrich the quantitative information provided through the post-surveys.

Finally, during the Cyprus exchange program focus groups were conducted (9 April 2025) with in-service teachers that completed all the phases of the training for a broader reflection on the training's scalability and applicability across different educational contexts. In the following sections we present each tool.

4.1.1. Post-Surveys

Two post-surveys were administered to gather participant feedback and recommendations for optimising and upscaling the MOOC and the Blended Learning course, respectively.

The MOOC post-survey included four Likert-scale items and one multi-part question with five items, where participants responded Yes or No to indicate whether specific steps were necessary to upscale the MOOC. The Likert-scale items measured how well the MOOC content aligned with participants' national educational policies and practices, whether it addressed challenges and opportunities specific to their contexts, and the potential for adapting or expanding the MOOC content across different regions. The multi-part Yes/No question asked about the necessity of steps such as expanding accessibility, providing follow-up support, creating institutional partnerships, developing localised content, and incorporating participant feedback to improve and scale the course. The overall aim of this survey was to assess the relevance and

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adaptability of the MOOC content in different national contexts and identify practical priorities for its optimisation and upscaling.

The Blended Learning post-survey consisted of one Likert-scale item, two open-ended questions, and two multi-part questions with a total of thirteen Yes/No items. The single Likert-scale item evaluated how adaptable participants perceived the synchronous and asynchronous modes of study for wider regional use, using a three-point scale from very adaptable to neutral. One multi-part Yes/No question with six items asked whether aspects such as accreditation, live workshops, tailored courses for pre-service and in-service teachers, self-paced content, practical resources, and opportunities for peer collaboration should be emphasised to encourage broader adoption. The second multi-part Yes/No question with seven items focused on steps necessary to upscale the Blended Learning course, including offering it independently from the MOOC, increasing hands-on activities, providing ongoing support, fostering peer feedback, localising content, incorporating participant feedback, and establishing institutional partnerships. The two open-ended questions invited participants to suggest necessary adaptations for local contexts and reflect on national policy changes that could promote Inclusive STEAM Education. The goal of this survey was to understand how the Blended Learning course could be made more relevant and applicable across diverse settings, which elements were crucial for scaling, and what contextual or systemic changes would support its wider implementation.

4.1.2. Focus Groups

In addition to post-surveys, focus groups were conducted to gain in-depth qualitative insights into teachers' experiences with the SpicE training programme. Three distinct focus groups were organised, each targeting participants of the different training phases: MOOC, blended learning and exchange programs. These discussions facilitated a deeper exploration of participants' perceptions, challenges, and recommendations for improving and upscaling the programme. The data gathered from these focus groups provided valuable qualitative insights that complemented the post-survey findings. By capturing teachers' experiences and recommendations in a structured yet open-ended manner, the focus groups contributed to a nuanced

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understanding of the training programme's effectiveness and potential for broader adoption in diverse educational contexts.

Focus Group: Teacher Experiences and suggestions for upscaling the MOOC

Following the completion of the MOOC, an online focus group was organised to gather participants' reflections on their learning experiences and to explore opportunities for enhancing the SpicE training programme. The discussion, guided by a semi-structured protocol, focused on ways to improve and expand the programme for broader implementation. The topics of the discussion were as follows:

- **Content and How to Improve:** Suggestions for refining learning materials. (e.g., "*Do you think adaptations to the course content are needed to make it more relevant or practical for everyday teaching?"*)
- **Community of Practice – Discussion Forums:** Strategies for increasing engagement and interaction (e.g., "*How could we improve collaboration between the participants of the MOOC, especially those from different regions, to help create a sense of shared learning and support?")*
- **Motivation:** Factors that influenced participant motivation and completion rates (e.g., "*What parts of the online course did you enjoy the most? What made them stand out?*").
- **Assessment:** Refinements to assessment methods to better align with learning objectives.

Focus Group: Teacher Experiences and suggestions for upscaling the blended learning program

A second focus group was conducted following the completion of the SpicE blended learning programme. This session aimed to capture participants' experiences with the hybrid format and explore potential improvements for future iterations. The discussion, guided by a semi-structured protocol, addressed the following topics:

- **Content and Session Improvement:** Enhancements to instructional materials and session design (e.g., "*Did any challenges arise when trying to participate in*

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the course activities or apply the materials in your classroom context? If so, how did you address them?").

- **Content – Material:** The quality and adaptability of provided resources (e.g., *How effective were the synchronous sessions (live seminars and lectures) in supporting your learning? Would you recommend any changes to improve their impact or accessibility?"*).
- **Format – Structure:** Refinements to the organisation and pacing of the programme (e.g., "*Which aspects of the blended learning format (synchronous/asynchronous) did you find most helpful or engaging in your teaching practice? Why?")*
- **Collaboration – Development of Community:** Approaches to strengthening the sense of community and peer support among participants (e.g., *How could we enhance collaboration and interaction among teachers from diverse regions or teaching contexts in the blended program, across (i) live sessions and (ii) asynchronous tasks?)*

Focus Groups: Teacher Experiences and suggestions for upscaling the SpicE training program

Focus groups to gather insights from teachers regarding the optimisation and expansion of the entire SpicE training program were conducted during the last exchange program in Cyprus. Through structured discussions participants that were engaged in all three phases of the training reflected on their experiences and provided feedback and suggestions for optimizing and upscaling the training, based on a semi-structured protocol that followed the Strengths-Weaknesses-Opportunities-Threats (SWOT) framework (see Figure 1). On the one hand, the Strengths and Weaknesses dimensions focus primarily on internal elements of the training program, what should be retained, refined, or tailored to ensure optimal implementation in new contexts. On the other hand, the Opportunities and Threats dimensions address external conditions crucial for scaling up the program in new settings.

The discussion between participants was structured around the four dimensions of the SWOT:

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Strengths highlight what works well and what should be preserved or reinforced during scaling. Example guiding questions included:

- *What do you consider to be the greatest strength of the SpicE training program, and why? (e.g., collaboration)*
- *What aspects of the SpicE training (MOOC, blended, and/or exchange) did you find most effective in supporting your professional development and classroom practice? (e.g., hands-on activities)*

Weaknesses identify internal design limitations or implementation barriers that may require revision or contextual tailoring. Example guiding questions included:

- *Did the combination of online (MOOC & blended) and face-to-face sessions (exchange programs) create any confusion or gaps in your learning process? (e.g., overlapping content, lack of continuity, time constraints)*
- *Were there elements of the SpicE training that you found challenging to apply in your specific classroom context? If so, what adjustments could help make them easier to implement? (e.g., curriculum alignment, various learning needs in class)*

Opportunities point to existing infrastructures, networks, and institutional alignments suggested by teachers that can support and sustain the program's expansion. Example guiding questions included:

- *What opportunities exist to adapt and promote the SpicE training program in other educational settings across your country? (e.g., teacher networks, local conferences)*
- *How can we ensure that more teachers continue to engage with and benefit from the SpicE training program over time? (e.g., mentoring networks, certified follow-up training)*

Threats reveal systemic and external risks that must be mitigated to ensure long-term success and relevance. Example guiding questions included:

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- *What cultural, institutional, or systemic barriers might prevent the wider adoption of the SpicE training program across your country? (e.g., lack of funding)*
- *As SpicE expands, what risks do you foresee in maintaining its quality and fidelity? (e.g., inconsistent training delivery, lack of monitoring)*

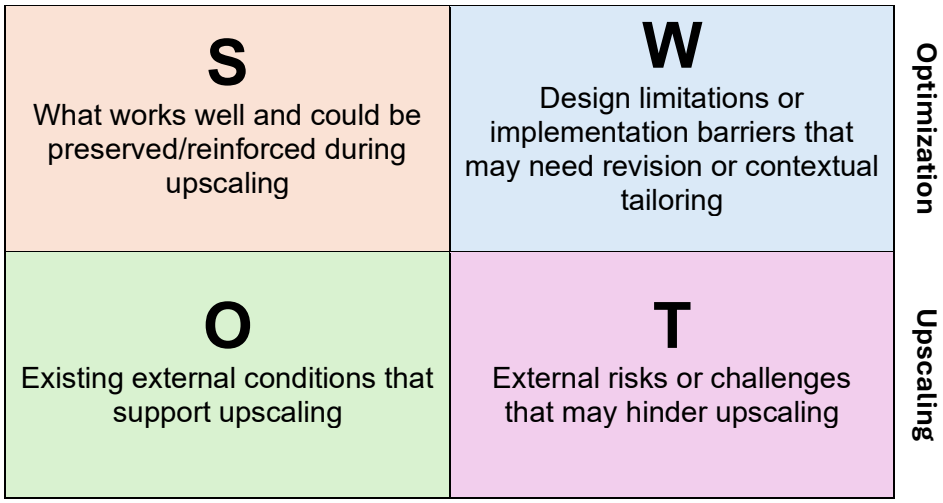

Figure 1. *SWOT dimensions for the SpicE project*

A central focus of the data collection process was the relevance and effectiveness of the training programme. Teachers provided feedback on the extent to which the SpicE training aligned with their professional development needs, the clarity and coherence of the content, and the practical applicability of the skills acquired. Additionally, participants discussed adapting the training to different educational contexts Participants also explored practical implementation and support, identifying the resources, tools, and institutional backing required to effectively embed the SpicE training within real-world classroom settings. Teachers shared best practices and lessons learned from their experiences, providing examples of how specific elements of the programme had been successfully incorporated into their teaching. These insights contributed to a broader understanding of scalable strategies for implementation.

Another key area of discussion was monitoring, evaluation, and sustainability. Participants reflected on the mechanisms needed to assess the long-term impact of the training, suggesting ways to enhance continuous professional development and

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ensure that the benefits of the programme extend beyond the initial training period. Finally, teachers offered their final thoughts and recommendations, proposing improvements to both content and delivery methods, as well as strategies for fostering a sustainable community of practice.

4.2 Participants

4.2.1 Post-surveys

A total of 931 participants completed the post-training evaluation surveys for the SpicE programme. Of these, 826 were involved in the MOOC and 105 in the blended learning format. Participants came from four main country groups - Greece, Cyprus, Spain, and Bulgaria - as well as a fifth group designated as “Other countries”, which included Turkiye, Romania, the Dominican Republic, Croatia, the Netherlands, Nigeria, and others. In the MOOC cohort, the majority of participants identified as female (79%), while 20% identified as male. A small proportion (1%) chose not to disclose their gender. In the blended learning group, the gender distribution was similar, with 80% of participants identifying as female and 20% as male. No participants opted not to disclose their gender in this group. Overall, female participants represented the vast majority in both delivery formats. This pattern is consistent with gender trends observed in the teaching profession, particularly within early childhood and primary education sectors.

In terms of professional affiliation, the sample included a mix of pre-service teachers, in-service educators, and other professionals such as school psychologists, educational consultants, and postgraduate researchers. Specifically, in the MOOC cohort, 15% of participants identified as pre-service teachers, 78% as in-service educators, and 8% as belonging to other professional roles. In the blended learning group, 9% of participants were pre-service teachers and 91% were in-service educators. This distribution highlights a strong representation of experienced practitioners across both formats, while also capturing the perspectives of those in earlier stages of their professional development.

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4.2.2 Focus Groups

The focus group engaged a diverse and professionally experienced group of participants across multiple settings and countries. The MOOC-focused online session was held with two educators: one specialising in both general and special education, and another working exclusively in special education. The blended learning focus group explored participants' views on the blended learning programme and involved two early childhood educators, one a preschool teacher and the other an inclusive teacher in preschool setting. Additionally, written feedback was obtained from two further pre-service teachers, offering reflective responses to the same set of questions addressed in the online focus group.

The most substantial data collection occurred during the face-to-face focus groups held in the context of the exchange program in Cyprus, which brought together 47 in-service teachers from Cyprus, Spain, Bulgaria, and Greece (12 from each country except Cyprus, which had 11 participants). These teachers, all currently working in primary or special education settings, held advanced degrees including Master's and Doctoral qualifications, ensuring a high level of expertise and relevance in their contributions to the evaluation process. All 47 teachers were also actively engaged in all three phases of the SpicE training program. Teachers were divided into groups of six (two groups per country). The questions per SWOT dimension were firstly presented to all participants in plenary by a facilitator and then the groups had time to discuss, reflect and provide in written their feedback and recommendations. Input was gathered anonymously in writing, identified only by country, to ensure confidentiality. Three facilitators were available to guide the in-group discussions and provide clarifications to participants when needed.

4.3 Data Analysis

To extract meaningful insights to develop evidence-based recommendations for optimizing and upscaling the SpicE training programme, qualitative and quantitative analyses were performed. Below, the data analysis process for each tool is presented.

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4.3.1 Analysis of post-survey data

A mixed-methods approach was employed to analyze the post-training survey data from both the MOOC and blended learning phases of the SpicE training programme. Quantitative data were analysed using IBM SPSS Statistics. Descriptive statistics, including frequency counts and percentages, were first computed to summarise responses to key items across country and participant groups. This allowed for an initial overview of trends in perceived course alignment, adaptability, and priorities for upscaling. To examine whether participants' perceptions differed significantly across national contexts for these items, Kruskal-Wallis H tests were conducted to compare responses among the five country groups (Greece, Cyprus, Spain, Bulgaria, and Other Countries). When significant differences emerged, Mann-Whitney U tests were used for post hoc comparisons to identify which specific country pairs showed variation. To minimise the risk of false positives from multiple testing, Bonferroni adjustments were applied.

For dichotomous (Yes/No) items addressing upscaling priorities and enhancement strategies, chi-square tests of independence were performed to examine associations between country of origin and endorsement of specific measures (e.g., institutional partnerships, follow-up support, localised content). Cross-tabulations supplemented these inferential analyses by providing detailed distributions of response patterns by country and professional role (i.e., pre-service teachers, in-service teachers and other professions).

Qualitative data collected from open-ended responses in the blended learning post-survey were analysed using thematic analysis. An inductive coding strategy was applied, beginning with open coding to identify recurring participant phrases and concepts. These initial codes were then grouped into broader categories to capture patterns across responses. This approach enabled the organisation of qualitative input into coherent themes, offering insight into participant perspectives and supporting a deeper interpretation of the survey data.

4.3.2 Analysis of Focus Group Data

Three rounds of focus groups were conducted to gain deeper qualitative insights into teachers' experiences and perspectives on upscaling the programme following each

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training phase. Data from the focus groups held after the MOOC and the blended learning programme were firstly transcribed and then analysed using open coding, aiming to complement and enrich the findings from the post-training surveys.

For the focus groups conducted during the Cyprus exchange program, an inductive qualitative approach was adopted. Open coding was initially applied to identify recurring patterns in participants' statements per SWOT dimension. These codes were then grouped into categories based on shared meaning and content, which were subsequently synthesised into broader themes that captured the collective viewpoints of the participants. Additionally, the frequency of statements within each category was recorded to highlight the most prominent themes and concerns emerging across the dataset.

4.3.3 Synthesising Findings for Developing Recommendations for Upscaling

The findings from all data collection tools were triangulated to ensure a holistic understanding of the training programme's strengths, limitations, and potential for broader implementation. Key findings from all data collection tools were synthesised through a two-step process.

First, individual datasets were analysed independently as outlined in the previous sections, producing both quantitative and qualitative outputs. Then, the insights were compared and cross-referenced to identify recurring patterns.

As a second step, the data were triangulated with the results of the D4.2 Unified Evaluation Report, which offered a broader evaluative perspective. D4.2 includes the outcomes of national evaluations of the SpicE training programme, the assessment of its underlying pedagogical frameworks, sustainability analyses, and recommendations for optimization.

Based on this triangulation process, evidence-based, practical recommendations were developed for educators, policymakers, and institutions wishing to adapt and scale the programme across varying educational environments. The recommendations were formulated and organised using a SWOT grid. This structure allowed for the categorisation of insights into elements of internal origin (i.e., Strengths and Weaknesses) reflecting the design and implementation of the SpicE programme itself,

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and elements of external origin (i.e., Opportunities and Threats) highlighting systemic enablers or constraints that could impact upscaling efforts.

5. Findings

This section begins with an examination of participants' responses to the post-surveys administered after the MOOC and blended learning program, focusing on areas such as policy alignment, educational relevance, and adaptability. It then reviews participants' perspectives on strategies for scaling and localising the course, based on findings from focus groups conducted after each of the two phases. Qualitative feedback is organised thematically to highlight key areas, including context adaptation, infrastructure constraints, language accessibility, and pedagogical practice.

These insights are further enriched by reflections from focus groups conducted after the exchange program, capturing participants' experiences and recommendations regarding various aspects such as the overall SpicE training structure, content, assessment formats, and peer interaction. This analysis is structured using the SWOT framework, which synthesises internal strengths and limitations alongside external opportunities and challenges relevant to the upscaling and contextualisation of the SpicE training programme.

5.1 Findings from the MOOC post-survey

5.1.1 Perceived Alignment of MOOC Content with National Educational Policies

To explore participants' perceptions of how well the MOOC content aligned with the educational policies and practices of their respective countries, a descriptive analysis using frequency counts and percentages was conducted. Participants responded to the statement, "*The MOOC content aligns with the current educational policies and practices in my country*", on a five-point Likert scale ranging from "Not at all" to "Completely". Table 2 presents the distribution of responses by country, showing both the frequencies and percentages for each response category.

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Table 2. Perceived Alignment of MOOC Content with Educational Policies by Country (*n*=826)

Alignment Level	Greece (*n*=349)	Cyprus (*n*=24)	Spain (*n*=90)	Bulgaria (*n*=77)	Other Countries (*n*=286)
Not at all	3 (1%)	1 (4%)	1 (1%)	0 (0%)	0 (0%)
Slightly	22 (6%)	1 (4%)	5 (6%)	3 (4%)	1 (0%)
Moderately	73 (21%)	7 (29%)	12 (13%)	8 (10%)	28 (10%)
Very much	112 (32%)	11 (46%)	25 (28%)	17 (22%)	70 (25%)
Completely	139 (40%)	4 (17%)	47 (52%)	49 (64%)	187 (65%)

Overall, the majority of respondents rated the alignment as either “Very much” or “Completely”. In Greece, 40% selected “Completely”, while Cyprus had the lowest proportion (17%), with more participants opting for “Moderately” or “Very much”. In contrast, participants from Other Countries (including Turkey, Romania, Dominican Republic, Croatia, and the Netherlands) demonstrated the highest level of agreement, with 65% indicating “Completely”. These results highlight the influence of national educational contexts on how MOOCs are received and evaluated. Perceived discrepancies in alignment may reflect differences in national strategies, educational traditions, and policy priorities, particularly in relation to STEAM and inclusive education.

A Kruskal-Wallis H test was conducted to identify any statistically significant differences in perceived alignment across countries. The analysis indicated a significant difference among countries in their perceptions of alignment ($H(4) = 65.335$, $p < .001$). Post-hoc pairwise comparisons using the Mann-Whitney U test (with Bonferroni correction, $p < .005$) revealed that Greek participants reported significantly lower alignment compared to those from Bulgaria and the group categorised as Other Countries. Cypriot respondents also reported significantly lower alignment than

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participants from Spain, Bulgaria, and Other Countries. No significant differences were found between Spain and Bulgaria, or between Bulgaria and Other Countries. While the MOOC appears broadly adaptable, the findings suggest the need for further contextualisation to accommodate the diversity of national education systems.

5.1.2 Perceived Relevance of the MOOC to National Educational Challenges

To evaluate how well participants felt the MOOC addressed specific challenges within their national educational contexts, the distribution of responses to the statement, "*The MOOC addresses challenges specific to my country's educational system and policies*", was analysed by country of origin. Table 3 presents the frequencies and percentages of responses by country.

Table 3. Perceived Alignment of the MOOC with National Educational Challenges *(n=826)*

Degree of Agreement	Greece (*n*=349)	Cyprus (*n*=24)	Spain (*n*=90)	Bulgaria (*n*=77)	Other Countries (*n*=286)
Not at all	0 (0%)	1 (4%)	1 (1%)	1 (1%)	2 (1%)
Slightly	18 (5%)	2 (8%)	4 (4%)	2 (3%)	0 (0%)
Moderately	63 (18%)	4 (17%)	14 (16%)	6 (8%)	29 (10%)
Very much	133 (38%)	13 (54%)	25 (28%)	18 (23%)	68 (24%)
Completely	135 (39%)	4 (17%)	46 (51%)	50 (65%)	187 (65%)

Although the MOOC was perceived as relevant to national educational challenges across all participating countries, levels of agreement varied slightly. The majority of respondents from Greece (77%), Bulgaria (88%), Spain (79%), Cyprus (71%), and Other Countries (89%) rated the MOOC as either "Very much" or "Completely" aligned with their national challenges. Notably, Cypriot participants showed the highest proportion selecting "Very much" (54%), while Bulgarian respondents had the largest

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proportion selecting “Completely” (65%). Spanish participants displayed a balanced distribution, with 28% choosing “Very much” and 51% “Completely.” The group categorised as Other Countries reported the highest overall agreement, with 89% rating the MOOC “Very much” or “Completely” aligned, despite this group not being the original target audience. These findings indicate that the MOOC was broadly perceived as relevant to addressing educational challenges in diverse national contexts, with particularly strong alignment reported by Bulgaria and Other Countries.

Statistical analysis revealed a significant variation across countries ($H(4) = 61.38$, $p < .001$). Post-hoc Mann-Whitney U tests indicated that participants from Bulgaria and Other Countries rated the relevance of the MOOC to educational challenges significantly higher than those from Greece ($p < .001$ in both cases). Cypriot participants reported the lowest level of relevance, with scores significantly lower than those of participants from Spain ($p = .010$), Bulgaria ($p < .001$), and Other Countries ($p < .001$). The results highlight the importance of developing MOOCs that are responsive to the specific educational challenges of each region. Future iterations should consider incorporating context-sensitive examples, adaptable practices, and regionally relevant case studies to more effectively address the heterogeneous nature of national educational systems and relevant challenges across Europe.

5.1.3 Addressing Country-Specific Educational Opportunities

To evaluate the extent to which the MOOC addressed opportunities specific to participants’ national educational systems and policies, participants were asked to indicate their level of agreement with the statement: *“The MOOC addresses opportunities specific to my country’s educational system and policies”,* Table 4 presents the frequencies and percentages of responses by country.

Table 4. Perceived Effectiveness of the MOOC in Addressing Country-Specific Educational Opportunities by Country *(n=826)*

Alignment Level	Greece (*n*=349)	Cyprus (*n*=24)	Spain (*n*=90)	Bulgaria (*n*=77)	Other Countries (*n*=286)
Not at all	1 (0%)	1 (4%)	1 (1%)	1 (1%)	1 (0%)

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Slightly	19 (5%)	0 (0%)	5 (6%)	3 (4%)	0 (0%)
Moderately	77 (22%)	8 (33%)	11 (12%)	8 (10%)	27 (9%)
Very much	126 (36%)	10 (42%)	27 (30%)	20 (26%)	70 (25%)
Completely	126 (36%)	5 (21%)	46 (51%)	45 (58%)	188 (66%)

Overall, 80% of respondents rated the MOOC as strongly relevant ("Very much" or "Completely"), but there was significant cross-national variation. A Kruskal-Wallis H test revealed a statistically significant difference in how participants perceived the MOOC's alignment with opportunities specific to their country's educational system and policies ($H(4) = 71.96$, $p < .001$). Specifically, Greece and the Other countries category showed high agreement, with 72% and 90% of respondents, respectively, perceiving strong relevance. In contrast, Cyprus reported lower endorsement, with only 20% of respondents marking it as "Completely", and a substantial portion (33%) rating it "Moderately". Post-hoc tests revealed significant differences between Greece and other countries, especially Bulgaria ($p < .001$) and Spain ($p = .015$), with Bulgaria showing stronger agreement (84%) and Spain (78%).

These findings suggest that while the MOOC's content generally resonated with participants, its relevance varied greatly across countries. This underlines the need for adaptable design to better address country-specific educational opportunities. When the MOOC is well aligned with the national educational context and policies, it can help to motivate and accelerate its adoption in different regions.

5.1.4 Perceived Adaptability and Transferability of the MOOC Content

To assess participants' perceptions of how easily the MOOC content could be adapted, expanded, or replicated across different regional and national contexts, respondents were asked to indicate their level of agreement with the statement: *"To what extent do you believe the content presented in the MOOC (the ideas, information, and lessons) can be easily adapted, expanded, or replicated to suit the*

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needs of a broader audience across different regions and countries?". Table 5 presents the frequencies and percentages of responses, disaggregated by country.

Table 5. Perceived Adaptability and Transferability of MOOC Content by Country *(n=826)*

Adaptability Level	Greece (*n*=349)	Cyprus (*n*=24)	Spain (*n*=90)	Bulgaria (*n*=77)	Other Countries (*n*=286)
Not at all	4 (1%)	0 (0%)	1 (1%)	0 (0%)	0 (0%)
Slightly	14 (4%)	2 (8%)	2 (2%)	0 (0%)	1 (0%)
Moderately	63 (18%)	4 (17%)	13 (14%)	6 (8%)	22 (8%)
Very much	128 (37%)	13 (54%)	28 (31%)	24 (31%)	72 (25%)
Completely	140 (40%)	5 (21%)	46 (51%)	47 (61%)	191 (67%)

Overall, the majority of respondents from all countries rated the MOOC's content as transferable and adaptable across different regions and countries. A Kruskal-Wallis H test was conducted to identify whether there was a statistically significant difference in participants' perceptions of the adaptability and transferability of the MOOC content across different countries. The results indicated a significant difference between the countries (H (4)=63.879, p<.001). This suggests that participants from different countries had varying perceptions of the adaptability of the MOOC content.

Post-hoc pairwise comparisons using the Mann-Whitney U test revealed several differences between specific countries. For instance, Greek participants demonstrated a significantly higher percentage of favourable responses compared to Cyprus, Spain, Bulgaria, and Other countries. Specifically, Greece showed a 76% favourable response rate, significantly higher than Cyprus's 64%, Spain's 62%, and Bulgaria's 58%. This indicates that Greek participants rated the MOOC content as more adaptable compared to participants from the other national groups. Similarly, Cyprus showed a significantly lower percentage of favourable responses (64%) compared to

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Bulgaria (58%), highlighting a difference in perceptions between these two countries. Additionally, there were significant differences between Spain and Bulgaria, with Bulgaria exhibiting a higher favourable response rate of 58% compared to Spain's 52%.

These findings highlight the impact of contextual factors, such as national educational infrastructure, digital readiness, and cultural differences, on participants' perceptions of the adaptability and transferability of MOOC content. As such, the results suggest that MOOCs should be tailored to better suit the specific needs and preferences of participants from different countries, ensuring they are adaptable to various regional and national contexts.

5.1.5 Perceived Priorities for MOOC Upscaling by Country

To explore regional differences in upscaling priorities, participants were asked to indicate (Yes/No) which of five measures they considered necessary: (1) expanding accessibility, (2) providing post-course support, (3) forming institutional partnerships, (4) developing localised content, and (5) incorporating participant feedback. To examine whether country-level differences in the degree of agreement for each statement were statistically significant, chi-square tests of independence were conducted.

Table 6. Percentage of Respondents Endorsing Each Upscaling Measure by Country

Upscaling Measure	Greece (*n*=349)	Cyprus (*n*=24)	Spain (*n*=90)	Bulgaria (*n*=77)	Other (*n*=286)	Total
Expanding the accessibility of the online course	50%	50%	66%	61%	62%	**57%**
Providing follow-up support after completion	55%	46%	50%	65%	61%	**57%**
Creating institutional partnerships	70%	79%	77%	78%	76%	**74%**
Developing localised content	47%	54%	51%	52%	53%	**50%**

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Incorporating participant feedback	44%	63%	40%	34%	44%	**43%**

Across the full sample, the highest overall agreement was observed for creating partnerships with schools and educational institutions (74%), followed by providing follow-up support and resources after course completion (57%) and expanding the accessibility of the online course (57%). Agreement was more moderate for developing localized content (50%) and incorporating participant feedback to improve the course (43%), suggesting these are viewed as supportive but not primary strategies. The majority of participants across all countries found follow-up support important, with especially high endorsement from Bulgaria (64.9%) and other countries (61%). In Greece (55%), Spain (50%) and to a slightly lesser degree in Cyprus (46%) the support was still valued. In addition, agreement with the importance of partnerships was high across the board, with 70–79% agreement in all countries. This widespread support indicates that embedding the programme into real-world school settings is a commonly shared priority. The agreement for incorporating participant feedback was lowest overall, with less than half of participants in most countries supporting it. However, Cyprus (62.5%) stood out for its relatively strong support.

Expanding the accessibility of the online course showed statistically significant variation by country ($\chi^2(4, n=826) = 13.84$, $p=.008$), indicating that this measure holds different levels of importance across countries. Respondents from Spain (66%), Bulgaria (61%), and other countries (62%) expressed the strongest agreement with the need to expand access to the online course. In contrast, respondents from Greece (50%) and Cyprus (50%) were evenly split. This suggests that accessibility is a more prominent concern in some countries. No significant differences were observed for the remaining four items ($p>.05$), suggesting a relatively consistent valuation of these strategies across national contexts.

The results highlight both commonalities and differences in scaling priorities across countries. While creating school partnerships and providing follow-up support were broadly supported, countries diverged more in areas such as accessibility, localized content, and participant feedback. Of the five items examined, only the statement regarding expanding the accessibility of the online course showed a statistically significant association with the country, indicating that this factor holds different levels

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of importance across national contexts. For the remaining items, follow-up support, partnerships, localized content, and incorporating feedback, no significant country-level differences were found, suggesting a more consistent perception of their importance across the participating countries.

5.1.6 Perceptions of Necessary Steps to Upscale the MOOC by Teacher Status

Participants' views on MOOC upscaling priorities were also examined across three groups: pre-service teachers, in-service teachers, and others (e.g., school psychologists, PhD students) by performing chi-square tests of independence for each item (see Table 7).

Table 7. Percentage of respondents who consider each upscaling measure important by teacher status

Strategy	Pre-Service (*n*=120)	In-Service (*n*=644)	Other (*n*=62)	Total
Expanding the accessibility of the online course	61%	56%	58%	**56%**
Providing follow-up support after completion	55%	58%	53%	**57%**
Creating institutional partnerships	76%	73%	76%	**74%**
Developing localised content	54%	49%	55%	**50%**
Incorporating participant feedback	48%	43%	42%	**43%**

As shown in Table X6, levels of agreement for each proposed measure were broadly similar across groups. Institutional partnerships received the highest endorsement overall (74%), followed by expanding accessibility (56%) and providing post-course support (57%). Developing localised content (50%) and incorporating participant feedback (43%) were less frequently endorsed. No statistically significant differences

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were found between groups for any strategy ($p > .05$), indicating that teacher status did not meaningfully influence perceived priorities for upscaling the MOOC.

5.1.7 MOOC Focus Group

These findings draw upon qualitative data collected through two focus groups conducted in October 2024, involving four participants with varied professional backgrounds in general and special education, including one pre-service teacher. To analyse participants' experiences and suggestions regarding the MOOC, thematic analysis was employed following Braun and Clarke's (2006) approach. This method enabled the identification of recurring themes that reflect both the strengths of the MOOC and key areas for improvement, with particular attention to its scalability and future optimisation.

Table 8. Thematic Analysis of Feedback from Teachers on the MOOC

Theme	Illustrative Quotes	Recommendations for Upscaling and Optimisation
Course Structure and Format	"If it wasn't self-paced, I would have missed some weeks" "The course structure was very organised" "An extra two or three weeks would help"	Preserve the self-paced format and modular design. Extend course duration to facilitate deeper engagement and accommodate professional responsibilities.
Content Relevance and Accessibility	"Would be useful to have more practical examples, best practices and detailed guidance"	Broaden the repository of age-appropriate examples and translate all content into local languages. Incorporate classroom-ready project templates and case studies.
Assessment and Feedback	"Valuable feedback… I found areas in which I needed to improve"	Simplify language in assessment tasks and increase the number of practical, scenario-based quizzes. Strengthen feedback mechanisms to enhance reflective learning.
Motivation and Recognition	"It's like 150 hours" "Maybe a reward system… a certificate, a badge, or recognition"	Introduce micro-credentials (e.g., certificates, badges), and provide opportunities for participants to publicly showcase their work. Include peer- and facilitator-based recognition strategies.

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Community of Practice	"Too many responses… easy to lose track" "Would be nice to work in small national or thematic groups"	Restructure forum spaces with tagging, upvoting, and categorisation tools. Establish smaller national/thematic discussion groups to encourage sustained peer collaboration.
Scalability and Upscaling	"Opportunities for personalised mentoring" "Collaborate with participants from different countries… present projects together"	Integrate mentoring schemes for differentiated support. Introduce structured, international collaboration projects and extend the course timeline to allow meaningful engagement.

The analysis showed that the self-paced, modular structure of the SpicE MOOC was highly valued, as it allowed educators to engage flexibly around their schedules and helped maintain motivation. However, several participants suggested extending the timeframe to allow deeper engagement with the material.

Content accessibility emerged as a key area for improvement. While resource quality was appreciated, the predominance of English materials and limited adaptation for younger learners or diverse linguistic contexts restricted inclusivity. Participants called for greater localisation, both in language and practical relevance, with more contextually appropriate examples and ready-to-use templates.

Assessment was generally seen as constructive, especially when formative feedback was provided, but some found quiz language complex and the formats too theoretical. There was a clear preference for applied, scenario-based assessments that better reflect classroom realities.

Motivation and recognition were central concerns, given the substantial time investment (50-150 hours). Participants recommended formal incentives such as certificates, digital badges, and opportunities for public sharing of work to sustain engagement and acknowledge efforts.

The community of practice was valued but underdeveloped. Overwhelming forum activity limited meaningful interaction, leading to calls for smaller, more focused discussion groups and improved forum tools like tagging and upvoting. Cross-border

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collaborative projects were particularly welcomed, with structured mechanisms suggested to facilitate intercultural exchange. For scalability, mentoring, differentiated participation tracks, and flexible engagement options were recommended. Mentorship was highlighted as a promising way to foster sustained involvement and confidence in inclusive STEAM teaching.

To support sustainable upscaling, it is vital to maintain the modular, self-paced design while offering longer timelines with intermediate milestones. Content localisation and practical resource adaptation are essential to increase relevance and accessibility. Assessment methods should be enhanced with applied, formative tools suited to varied language abilities. Recognition systems and stronger community structures, including mentorship and collaboration tracks, can boost motivation and engagement. Finally, user-friendly platform design and tiered technical support will ensure accessibility for all participants.

The qualitative focus group insights complement and deepen the quantitative findings by highlighting specific barriers such as language, cultural fit, and assessment challenges that affect perceived alignment and engagement across countries. Together, these findings underscore the need for a multi-faceted approach to MOOC design that balances content relevance, accessibility, social interaction, and recognition to maximize impact and scalability.

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5.2 Findings from Blended Learning Post-Survey

5.2.1 Perceptions of Adaptability of Blended Learning Activities by Country

To examine participants' views on the adaptability of the Blended Learning Course, a descriptive analysis was conducted. Participants responded to the question: *"To what extent do you think the synchronous (live online workshops) and asynchronous (e-documents, self-paced modules) activities of the Blended Learning course can be effectively adapted or expanded for broader use across various regions?".* Table 9 presents the frequency and percentage of responses from each country.

Table 9. Perceived Adaptability of Blended Learning Activities by Country (*n*=105)

Country	Very Adaptable	Adaptable	Neutral
Greece (*n*=39)	31% (12)	51% (20)	18% (7)
Cyprus (*n*=10)	30% (3)	40% (4)	30% (3)
Spain (*n*=13)	39% (5)	46% (6)	15% (2)
Bulgaria (*n*=14)	29% (4)	50% (7)	21% (3)
Other countries (*n*=19)	58% (11)	42% (8)	0% (0)

The results indicate a generally positive perception of the adaptability of the Blended Learning course across the participating countries. Overall, the majority of respondents rated the course activities as either "Very Adaptable" or "Adaptable", suggesting a broad endorsement of the course's potential for wider implementation beyond its original context.

Participants from countries categorized as Other demonstrated the most favourable views, with 58% considering the course "Very Adaptable" and the remaining 42% describing it as "Adaptable". Notably, no respondents from this group selected the

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neutral option, indicating strong consensus on the course's transferability. Similarly, participants from Spain expressed high confidence in the course's adaptability, with 39% rating it as "Very Adaptable" and 46% as "Adaptable". In Greece, which contributed the largest proportion of responses, 31% of participants selected "Very Adaptable", and 51% selected "Adaptable", confirming a strong overall approval of the course's design and potential for broader application.

Cyprus and Bulgaria also demonstrated positive attitudes, with 70% and 79% of their respective respondents providing favourable ratings. However, these two countries had slightly higher proportions of neutral responses, 30% in Cyprus and 21% in Bulgaria, suggesting some level of uncertainty. This may reflect specific contextual challenges such as institutional support, or local educational policy factors that could affect perceptions of adaptability.

In summary, the findings suggest that educators across various countries view the Blended Learning course as a flexible and scalable model that could be effectively implemented in diverse educational settings. The generally high levels of agreement across regions provide encouraging evidence for the course's broader applicability and relevance.

5.2.2 Adaptations and Changes Suggested for Local Relevance and Applicability of the Blended Learning Course

To understand how the blended learning course could be adapted to diverse local contexts, participants from multiple countries responded to the open-ended question: *"What adaptations or changes do you think are necessary to be performed for making this Blended learning course more relevant and applicable in your local context or country?"*. The qualitative data gathered were analysed using thematic content analysis. Responses were first coded to identify recurring themes and patterns. These codes were then grouped into broader categories reflecting key areas of adaptation recommended by participants. The thematic categories were refined iteratively to ensure clarity and representativeness of the collective input. Direct quotes from participants were used to illustrate the nuances within each theme (see Table 10).

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As shown in Table 10, he analysis of responses from 105 participants regarding necessary adaptations to improve the relevance and applicability of the Blended Learning course in their local contexts revealed several prominent themes.

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Table 10. Participant-Identified Adaptations for Increasing Relevance and Applicability of the Blended Learning Course in Local Contexts

Theme / Category	Frequency (number of statements)	Percentage (%)	Representative Ideas and Quotes
Localization and Cultural Relevance	38	36%	"Localizing content to reflect cultural environment" "Include case studies and projects that resonate with local societal and educational challenges", "Culturally adapted materials aligned with national curriculum"
Language Accessibility and Multilingual Support	29	28%	"All resources should be in English or the local language", "Bulgarian translation of menus and content", "Materials in multiple languages or dialects"
Accessibility and Infrastructure	35	33%	"Ensure all schools have access to fast internet and modern devices", "Provide offline resources for areas with limited connectivity", "Mobile-friendly applications and downloadable materials"
Practical Application and Hands-on Training	26	25%	"Mention more applications and less theory", "Hands-on practical workshops", "More practice and specific instructions", "Interactive modules such as quizzes, group tasks, and videos for busy teachers", "Practical examples from colleagues' training"
Inclusive Education and Support for Diverse Learners	22	21%	"Support for students with intellectual and developmental disabilities", "Collaboration between specialists for children with mild disabilities"
Alignment with Local Curriculum and Policies	19	18%	"Adapting course materials to align with Greek or national curriculum standards", "Including local education policies and laws", "Flexibility for educators to integrate into existing curricula"
Teacher Training and Ongoing Support	24	23%	"Enhancing teacher training on blended learning tools", "Regular live workshops and peer-led sessions"
Community and Stakeholder Engagement	13	12%	"Establish partnerships with local industries", "Involving parents and community in education",

			"Networking among educators to share resources", "Inviting local experts to share best practices"
Technological Innovation and Interactivity	11	10%	"Incorporate AI and interactive elements", "Short videos with key messages", "Improve platform interface for 21st-century expectations"
Resource Availability and Equity	16	15%	"Design course components for rural and underserved regions", "Ensure equitable access to course materials and technology"
Other / No Adaptations Needed	9	9%	"No adaptations needed", "Course is effective as it is" "High-level course, easy to use, perfect application"

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Localization and Cultural Relevance (36%) emerged as the most frequently cited adaptation. Participants emphasised the importance of tailoring course content, examples, and case studies to reflect the specific cultural, social, and educational realities of their regions. This suggests that culturally contextualized learning materials significantly enhance course engagement and practical application.

Closely related, *Accessibility and Infrastructure (33%)* was identified as a critical factor. Participants highlighted disparities in access to modern devices across schools, especially in rural or under-resourced areas. The need for offline-capable resources and mobile-friendly platforms was repeatedly stressed to ensure inclusivity and broad accessibility.

The theme of *Language Accessibility and Multilingual Support (28%)* also featured prominently, with participants calling for course materials to be available in local languages or multiple languages to overcome language barriers. This reflects the diversity of participants' contexts and the vital role of language in educational equity and understanding.

Practical Application and Hands-on Training (25%) was another key recommendation. Many respondents expressed a preference for more practical, application-focused content rather than theoretical instruction. Suggestions included interactive activities, clearer step-by-step guidance, and peer-shared practical examples, underscoring the value of experiential learning.

The necessity for *Teacher Training and Ongoing Support (23%)* was frequently noted. Participants identified the importance of equipping educators with technical skills and pedagogical strategies through workshops, live sessions, and peer collaboration. This ongoing support is crucial to sustain blended learning adoption effectively.

Further important themes included *Inclusive Education and Support for Diverse Learners (21%)*, which highlighted the need for adaptive tools and strategies to accommodate students with special educational needs, and Alignment with Local Curriculum and Policies (18%), ensuring course content complies with national educational standards and frameworks. Less frequently mentioned, but still significant, were calls for *Community and Stakeholder Engagement (12%)* to foster local partnerships and support networks, as well as Technological Innovation and Interactivity (10%) to modernize course delivery with AI and interactive tools. Lastly, some participants (9%) expressed satisfaction with the course as it stands, indicating

no need for further adaptations, while others pointed to ongoing challenges around *Resource Availability and Equity (15%)*, emphasizing disparities in equipment and funding that need addressing to facilitate equitable learning experiences.

Overall, these findings highlight the multifaceted nature of adapting blended learning courses to varied local contexts. Successful implementation depends on a balanced approach that integrates cultural relevance, technological accessibility, language inclusivity, practical training, and policy alignment to empower educators and learners alike.

5.2.3 Participant-Driven Priorities for Enhancing and Scaling Blended Learning

A descriptive analysis was conducted to evaluate responses from 105 participants to two binary (yes/no) survey questions. The first question asked which aspects of the blended learning course should be emphasised to encourage international adoption ("*What aspects of the blended learning course do you think should be more emphasised to encourage adoption in other countries?*"; Table 11). The second question explored what steps were considered necessary for upscaling ("*What steps do you think are necessary to upscale the blended learning course?*"; Table 12). The percentage of yes and no responses was calculated to determine endorsement rates for each item.

Table 11. Priorities for International Adoption of Blended Learning (*n*=105)

Aspect	Yes (%)	No (%)
Practical examples/resources	82	18
Live online workshops/lectures	51	49
Separate courses for pre-/in-service teachers	51	49
Accreditation via certificates	39	61

Self-paced content	41	59
Continued peer collaboration	45	55

The analysis of participants' priorities for improving and scaling the blended learning course revealed clear patterns. As revealed through the thematic analysis of participants' suggestions (see previous section) practical, example-based activities and resources were identified as the most critical element for international adoption, endorsed by 82% of respondents. This underscores a strong demand for applied, contextually relevant content that bridges theory and practice. Moderate support was observed for live online workshops and the provision of separate course pathways (51% each), reflecting a balanced interest in interactive formats and role-specific differentiation. In contrast, features such as self-paced content (41%), continued peer collaboration (45%), and accreditation through certificates (39%) received comparatively less emphasis, challenging the assumption that flexibility or formal credentialing alone drive adoption.

Chi-Square tests revealed a statistically significant association between country and preference for accreditation through certificates, ($\chi^2(4, n=105) = 14.05$, $p = .007$). This indicates that participants' valuation of certification varied across national contexts, potentially reflecting different professional development policies or expectations regarding formal recognition. No statistically significant country-level differences were observed for the other features. These findings align with the frequencies reported in Table 11 and suggest that, while most priorities were consistent across countries, certification requirements may need to be adapted to suit local contexts when designing internationally scalable professional development programmes.

Table 12. Strategies for Scaling the Blended Learning Course (*n*=105)

Strategy	Yes (%)	No (%)
Institutional partnerships	74	26

Localised content development	59	41
Post-course support/resources	58	42
Standalone course delivery	44	56
Peer feedback sessions	31	69

Regarding upscaling strategies, as with the MOOC post-survey, institutional partnerships were overwhelmingly endorsed (74%), highlighting the perceived necessity of anchoring the course within formal educational systems. Localised content development (59%) and follow-up support (58%) also ranked highly, reinforcing the need for contextual adaptation and sustained engagement. Conversely, peer feedback sessions (31%) and standalone course delivery (44%) were less favoured, indicating hesitancy toward collaborative evaluation and a preference for integrating the course with existing structures like MOOCs. These findings collectively prioritise practical utility and structural integration over formal accreditation or peer-driven models. The results advocate for a design framework that balances interactive, applied learning with institutional partnerships and regional customisation to enhance scalability.

Chi-square tests were conducted to explore whether participants' country of origin influenced their preferences for specific strategies to enhance the blended learning course. No statistically significant associations were found between country and any of the strategies listed in Table 12. These findings suggest that preferences for these course improvement features were generally consistent across countries.

5.2.4 Policy Priorities for Inclusive STEAM Education: A Qualitative Analysis

Inclusive STEAM education has become a key objective in educational policy reform globally. As part of the blended learning course, a post-survey was conducted to gather participants' views on the most critical national policy changes needed to support inclusive STEAM approaches. Participants (*n*=89) were asked to identify what they believed to be the three most important policy reforms.

An open coding analysis was conducted on the qualitative responses using an inductive thematic approach. Each individual statement was coded and grouped into emerging themes based on conceptual similarity and frequency. Six key categories were identified:

1. Teacher Training, Certification & Mentorship;
2. Curriculum Design & Development (Inclusive, Flexible);
3. Equitable Access to Digital Tools, Infrastructure & School Resources;
4. Collaboration & Policy-Backed Support;
5. Interculturality & Culturally Responsive Pedagogy;
6. Time Management & Administrative Burdens.

The following table presents the frequency and percentage distribution of statements across these categories, followed by a discussion interpreting these findings in relation to existing literature and policy challenges.

Table 13. Frequency and Percentage of Responses by Category (*n*=89)

Theme/Category	Frequency (Number of Statements)	Percentage	Representative Ideas and Quotes
Teacher Training, Certification & Mentorship	43	24%	"Ongoing professional development", "Mentoring programmes", "Specialised STEAM training"
Inclusive Curriculum Design	41	23%	"UDL principles", "Curriculum reform for inclusion"
Equitable Access to Resources	40	22%	"Assistive technologies", "STEAM labs", "Digital resource libraries"
Collaboration with Stakeholders	21	12%	"Partnerships with universities/industry", "STEM ambassador programmes"

Culturally Responsive Pedagogy	17	10%	“Culturally inclusive content”, “Diverse role models”
Time Management & Administrative Burdens	16	9%	“Lack of planning time”, “Overworked teachers”

Participants identified clear priorities for advancing inclusive STEAM education through national policy reform. The most prominent theme (24%) was *Teacher Training, Certification & Mentorship*, reflecting the belief that educators are the linchpins of inclusive practice. Respondents emphasised the need for continuous professional development in inclusive pedagogies, with particular attention to mentorship and professional networks to support sustained growth. This underscores the necessity of embedding inclusive education into teacher preparation and in-service training.

The second most cited category (23%) was *Inclusive and Flexible Curriculum Design*. Participants called for the adoption of Universal Design for Learning (UDL) principles and reforms enabling curricula to accommodate diverse learning pathways. The emphasis was on flexible, cross-disciplinary STEAM content that supports differentiated instruction and engages a broader spectrum of learners.

Closely following, at 22%, was *Equitable Access to Digital Tools, Infrastructure, and School Resources*. Respondents stressed the disparities in access to technological and material resources, especially in under-resourced schools. National policies were seen as needing to invest in digital inclusion, assistive technologies, and fully equipped STEAM environments to enable genuine participation for all students.

While less frequent, *Collaboration with Stakeholders* (12%) remained significant. Participants advocated for stronger partnerships between schools, universities, industries, and community organisations. They also called for leadership structures and policy frameworks that facilitate teacher collaboration and integrated support services.

Interculturality and Culturally Responsive Pedagogy (10%) focused on representing diverse identities and experiences within teaching and learning. Participants called for culturally inclusive content, diverse role models, and pedagogical practices that validate learners' backgrounds, highlighting a broader conception of inclusion that extends beyond disability to encompass cultural relevance.

Finally, *Time Management and Administrative Burdens* (9%) captured the structural constraints teachers face. Comments pointed to large class sizes, excessive paperwork, and insufficient time for inclusive planning and collaboration. These barriers underline the need for policies that acknowledge the real-world conditions of teaching and provide adequate support.

Taken together, these findings suggest that fostering Inclusive STEAM education requires systemic reform that addresses human, material, cultural, and structural dimensions. Policy efforts must extend beyond isolated initiatives and instead adopt a multi-layered strategy that empowers educators, ensures equitable resource distribution, promotes cultural responsiveness, and mitigates institutional constraints. Participants' insights reflect an understanding of inclusion as a comprehensive, cultural shift within education systems, one that must be fully supported through coherent and realistic policy frameworks.

5.2.5 Blended Learning Focus Group

These findings draw upon qualitative data gathered through one focus group conducted in December 2024, complemented by written reflections from four educators involved in the SpicE blended learning program. Participants were early childhood and primary teachers with diverse professional experiences in inclusive STEAM education. Emphasis was placed on practical implementation, community-building, and conditions for scalable dissemination.

Table 14. Thematic Analysis of Feedback from Teachers on the Blended Learning Program

Theme	Illustrative Quotes	Recommendations for Upscaling and Optimisation
Flexibility with Guided Structure	"The flexibility was key, but I would have missed a lot	Maintain the blended format by combining asynchronous flexibility with

	without the Zoom sessions". "Reminders helped me stay on track."	regular live sessions to reinforce accountability. Incorporate automated reminders and personalised planning tools to help participants manage their time effectively.
Relevance and Practicality	"I loved the templates—it made it easy to apply in my classroom" "Examples from other countries were inspiring"	Expand access to practical, downloadable materials differentiated by age group and subject. Include annotated best practices from international classrooms to inspire adaptation and innovation.
Inclusivity and Differentiation	"We need more tools for children with learning difficulties" "Some activities weren't ideal for younger kids"	Incorporate Universal Design for Learning (UDL) strategies into all content and activities. Develop separate content tracks or adaptations specifically for early childhood and primary levels, including tools tailored to various learner profiles.
Peer Learning and Community	"It was motivating to hear how others used the ideas" "I'd love a space to keep sharing beyond the course"	Create long-term online community spaces with thematic discussion boards and peer-sharing threads. Organise periodic regional virtual meetups or moderated forums to foster sustained peer-to-peer learning.
Interactivity and Engagement	"The tasks helped me think differently" "Sharing my story felt empowering"	Embed more hands-on, scenario-based tasks throughout the modules and provide prompts that invite storytelling and creativity. Enable participants to publish or share selected outputs in a peer-reviewed gallery.
Technical and Logistical Barriers	"It was a lot to juggle with my job" "Some tools were confusing"	Streamline platform navigation and consolidate tools into a single, intuitive interface. Offer tiered technical support and onboarding materials tailored for users with different levels of digital literacy.

Scalability and Dissemination	"More schools should know about this"	Develop targeted outreach materials for school leaders, including implementation guides and evidence of impact. Promote the program through teacher ambassador networks and regional showcase events that highlight success stories.

The blended learning format was generally well-received, with participants highlighting the value of its flexible structure underpinned by regular live sessions and check-ins. These synchronous touchpoints offered a sense of continuity and accountability, without which several participants believed they would have disengaged. While the asynchronous elements allowed teachers to manage their professional responsibilities, the inclusion of scheduled sessions and reminder systems proved critical in maintaining motivation and focus. A recurring recommendation was to offer these sessions across varying time zones and in smaller breakout groups based on topics or teaching levels to maximise interactivity and relevance.

Content relevance emerged as a strong point, particularly where it intersected with practical, classroom-ready materials. Participants praised the inclusion of downloadable templates and cross-cultural examples that helped contextualise inclusive STEAM education beyond local norms. However, the need for more robust differentiation was frequently noted, especially in catering to younger learners and students with disabilities. The current content, while inclusive in intent, sometimes lacked the flexibility to accommodate neurodiversity or early childhood developmental stages. Participants advocated for more targeted resources aligned with Universal Design for Learning (UDL) frameworks and called for clearly demarcated content streams for early childhood and primary practitioners.

Opportunities for peer learning were perceived as both motivating and professionally enriching. Live interactions fostered a spirit of exchange, yet several teachers expressed a desire for ongoing peer engagement beyond the formal training window. The forum component, while available, was underused or seen as lacking structure. To enhance community building, participants recommended the creation of sustained

peer networks, such as moderated online forums or regional groups, where experiences, materials, and insights could continue to be shared after course completion.

The course's balance between theoretical foundations and practical application was appreciated, especially where creative and reflective activities were included. Tasks involving storytelling and personal narrative were seen as empowering and helped bridge the gap between abstract concepts and lived teaching practice. Nonetheless, participants called for more interactive features within the asynchronous modules, such as quizzes, simulations, and scenario-based problem solving, to deepen engagement and consolidate learning.

Despite the program's strengths, several logistical and technological challenges were reported. Participants experienced difficulties in navigating multiple platforms and tools, which detracted from the learning experience, particularly for those with limited digital literacy or restricted time. A streamlined technological environment, accompanied by introductory tutorials and tiered technical support, was suggested to improve accessibility and minimise cognitive overload.

Moreover, considerations around scalability and broader dissemination were prominent. While the program was considered impactful at an individual level, participants noted a lack of school-level and leadership engagement. The involvement of school leaders was often late or minimal, hindering the potential for institutional uptake. Participants proposed the development of leader-focused toolkits, structured outreach strategies, and storytelling mechanisms that highlight successful implementation in diverse classrooms to promote wider visibility and buy-in. In sum, the findings from the Blended Learning focus group affirm the strengths of the format in balancing flexibility and structure, fostering engagement, and offering practical tools for inclusive STEAM education. However, for broader adoption, the program would benefit from enhanced differentiation, improved technological usability, and more intentional strategies for peer connection and institutional advocacy.

The findings from the focus group strongly reinforce and complement the broader patterns identified in the survey-based analyses, particularly in relation to adaptability,

localisation, and conditions for scalability. First, the focus group's emphasis on flexibility with guided structure aligns with the generally positive perceptions of adaptability reported across countries. Participants highlighted the importance of maintaining synchronous sessions alongside self-paced elements, an approach also reflected in the 51% of survey respondents who prioritised live workshops for international adoption. This underscores the value of maintaining blended formats that support both autonomy and structured interaction.

Moreover, the focus group insights into relevance and practicality—with teachers favouring classroom-ready materials and real-world examples—closely mirror the survey's most endorsed priority for international scaling: practical resources and examples (82%). This convergence suggests that applicability to everyday teaching contexts is not only a local preference but a key consideration across national boundaries. Similarly, the call for more inclusive and differentiated resources in the focus group dovetails with survey themes around support for diverse learners and local curriculum alignment, indicating a widespread need for more targeted, culturally responsive adaptations.

The strong interest in peer learning and community-building from focus group participants, though underutilised in current course design, echoes participants' survey responses advocating for post-course support (58%) and institutional partnerships (74%). This suggests that sustained professional networks and school-level engagement are vital enablers of long-term impact. Finally, the logistical and technical challenges raised, particularly regarding platform navigation and digital accessibility, resonate with survey findings identifying accessibility and infrastructure (33%) as key barriers, and further support the call for streamlined delivery systems and differentiated onboarding.

Together, these intersecting findings highlight a shared emphasis on practical, inclusive, and context-sensitive design, and suggest that successful scaling of the blended learning model will depend on its ability to adapt to diverse local conditions while maintaining core structural supports and community engagement mechanisms.

5.3 SWOT analysis

5.3.1 Introduction

The SWOT analysis presents a structured synthesis of teacher feedback and considerations related to the upscaling and optimization of the SpicE training program. Through this analysis, e findings are clustered into four distinct dimensions: Strengths, Weaknesses, Opportunities, and Threats, each offering a different lens to understand the program's adaptability and scalability across diverse contexts. Each dimension plays a specific role in informing the upscaling process:

- **Strengths** highlight what works well and what should be preserved or reinforced during scaling.
- **Weaknesses** identify internal design limitations or implementation barriers that may require revision or contextual tailoring.
- **Opportunities** point to existing infrastructures, networks, and institutional alignments suggested by teachers that can support and sustain the program's expansion.
- **Threats** reveal systemic and external risks that must be mitigated to ensure long-term success and relevance.

On the one hand, the Strengths and Weaknesses dimensions focus primarily on internal elements of the training program — what should be retained, refined, or tailored to ensure optimal implementation in new contexts. On the other hand, the Opportunities and Threats dimensions address external conditions crucial for scaling up the program in new settings. In the next sections, a presentation of the findings per SWOT dimension is provided. These findings are based on inductive qualitative analysis and are intended to inform educators or institutions considering the adaptation, optimization, or institutionalization of the SpicE training program.

5.3.2 Teachers' perceived strengths for the SpicE training program

Identifying the strengths of the SpicE training program provides a crucial foundation for its upscaling and adaptation across diverse educational contexts. These strengths

reflect the core components of the program that were most valued by teachers. By focusing on what worked well, we gain insight into the essential elements that should be preserved, emphasized, or strategically replicated in future implementations. For organizations or educators looking to adopt, adapt or adjust the SpicE program, this analysis highlights which features are likely to drive teacher engagement, professional growth, and implementation success. Furthermore, understanding the program's strengths allows for more informed adaptation — enabling implementers to maintain the program's core strengths while tailoring it to local needs.

In the list below, the thematic categorization of strengths is presented, along with the underlying categories and representative participant responses. Each of the five themes encapsulates a distinct aspect of the program's impact, reflecting teachers' experiences related to collaboration, professional growth, training structure, content quality, and the practical relevance of the training to classroom practice.

Collaborative Learning — Teachers valued the opportunity to share, exchange, and co-create with others — across countries, schools, and disciplines.

- **Categories:**
  Opportunities to share (13)
  Collaboration (11)
  Inspiration (3)

Representative quote:
"Sharing ideas and experiences with people from other countries is the best part of the programme." [Spanish teacher]

Professional Development — Teachers reported growing professionally mostly by increasing their confidence in teaching Inclusive STEAM education but also by developing their skills and knowledge.

- **Categories:**
  Teachers' confidence (4)
  Skills development (3)
  Knowledge development (1)

Representative quote:
"As teachers in the field of STEAM education we now feel more confident" [Cypriot teacher]

Training Design — Teachers appreciated the experiential format and structured delivery.

- **Categories:**
  Experiential learning (10)
- Format of training (8)
  Available feedback (1)

- **Representative quote:**
  "Interdisciplinary and creative approach to problem solving, focus on experiential learning and real-world application" [Greek teacher]

Relevance to practical application — Teachers felt they could apply what they learned into their teaching practice, supported by resources and examples.

Category:
Practical application (11)
Resources available (4)
Examples of educational practices (2)

Representative quote:
"First, by learning the SpicE methodology and then by integrating it into our daily teaching with kids." [Spanish teacher]

The Strengths dimension of the SWOT analysis provides a snapshot of what participants most appreciated during their engagement in all three phases of the SpicE training program.

The most frequently mentioned strength was the **opportunity to share and collaborate with peers**. Teachers consistently valued engaging with colleagues from different schools, regions, and countries, especially during the face-to-face exchange programs. Sharing also occurred meaningfully during the MOOC and blended phases, particularly through forums and peer-to-peer reflection activities. Teachers referred to the exchange of ideas, good practices, and real classroom experiences as sources of both professional insight and inspiration. Teachers found value in hearing how others navigated classroom challenges, as well as discussing approaches to Inclusive STEAM education in different contexts. These exchanges supported not just content learning but fostered a sense of community that carried and strengthened across training phases. Closely connected to this were reflections on **collaboration**. Participants described how working in multicultural and interdisciplinary teams deepened their engagement with inclusive STEAM education and encouraged reflection on their own teaching practices. In this sense, collaboration and sharing are not separate strengths but mutually reinforcing conditions that amplify learning — and therefore should be designed together in future scaling strategies.

Another major theme emerging from the analysis was **practical application**, emerging from teachers' reflections on how they could apply what they learned in their own classrooms. Statements referred to inclusive lesson planning, project-based learning inspired by the SpicE modules, as well as how inclusive STEAM education can strengthen student engagement and motivation. Practical application was also linked with the training content and resources available throughout the training. Some participants emphasized the value of having access to relevant, well-structured **resources including practical examples** that make the content more tangible and easier to implement.

The overall **training design** was also greatly appreciated by participants. Specifically, the **experiential learning approach** was highlighted, particularly in relation to the exchange programs. Teachers appreciated the chance to learn by doing, to test ideas in collaboration with others, and to witness inclusive STEAM pedagogy in action. In addition, the training format itself, particularly its sequencing and internal coherence, was viewed positively. Teachers noted the clear progression between the three phases (MOOC, blended, exchange), and some emphasized the importance of clarity in delivery and guidance. These experiences helped bridge the gap between theory and

practice. As a group of teachers mentioned: “Face-to-face sessions offered a substantial support of the more theoretical MOOC and blended online courses”.

While not as frequently emphasized as other themes, several teachers also described the SpicE program as contributing to their **professional growth**. This included developing their skills, building confidence in implementing inclusive practices, and increasing their familiarity with STEAM approaches. These reflections were often linked to the collaborative and experiential approach to learning during the training.

5.3.3 Teachers perceived weaknesses for the SpicE training program

Understanding the weaknesses reported by teachers during the SpicE training program is essential for improving its design, delivery, and adaptability in future scaling efforts. These insights reveal challenges that hindered engagement with the training content or classroom implementation. The identification of these challenges supports the revision of the training format and ensures smoother transfer to practice. For institutions or educators seeking to adapt the SpicE program, the weaknesses dimension of the SWOT analysis highlights where contextual adjustments may be needed. Addressing these weaknesses supports effective upscaling and the refinement of the training’s delivery in diverse environments.

In the list below, the themes concerning weaknesses deriving from teachers’ responses are presented, along with the underlying categories and representative quotes.

Transfer-to-Practice Challenges Barriers to enacting inclusive STEAM education in classroom setting due to contextual, curricular, or institutional constraints.

Categories:
- Implementation challenges (18)
- Limited practical resources and examples (8)

Representative quote:
"It was challenging to apply in our specific classroom context according to the different learning levels and needs of the children." [Spanish teacher]

Training Design Limitations The structure, workload, and delivery of the training — especially in the MOOC phase — presented difficulties for participants.

Categories:
- Cognitive overload (7)
- Time consuming (6)
- Training format restraints (5)

Representative quote:
" During the MOOC, there was indeed some overlapping. At certain points, it felt like the theory was being repeated or not presented in the correct sequence" [Cypriot teacher]

Two distinct themes emerged from teachers' statements on weaknesses concerning the SpicE training program: one related to external factors that influenced the feasibility of implementing the program in real school settings, and another focused on the inherent characteristics of the training itself.

The most prominent theme emerging from the data was what we refer to as **transfer to practice challenges**. Teachers frequently expressed difficulty in translating the training content into their own classroom realities. This included mismatches between the examples and practices presented during the training and the complexity of diverse student needs, rigid national curricula, or school-specific constraints (e.g., integrating inclusive STEAM practices within constrained school timetables, classes with a lot of students, lack of time to collaborate with others). For instance, a group of Bulgarian teachers mentioned that "it's difficult to implement inclusive education in bigger classes" and Cypriot teachers reported that their main concern was "…the application of the practices within the context of the national curriculum in our country".

Teachers noted that while the program was relevant to pedagogical practice (see also Strengths section), adaptation to their school environments was often difficult, particularly without tailored examples or resources suited to their specific teaching contexts. Therefore, some teachers called **for more practical resources and classroom examples**, which they felt would have eased this transfer process. In the

absence of context-related examples, the content sometimes remained abstract — limiting both its usability and teacher confidence in applying it. As a group of Spanish teachers mentioned, “It would have been useful to show more real classroom implementation examples to understand better how to implement the theory”. These resources could include activities and practices, lesson templates for Inclusive STEAM education, digital tools etc.

The second theme identified through the analysis focused on **characteristics of the training program** itself that may have hindered some teachers’ engagement or limited its overall impact. While these weaknesses were less frequently reported than external implementation challenges, they still reflect important considerations when upscaling the program.

One challenge was **cognitive overload**, stemming from the density and/or repetition of the material, especially during the online training. Some groups of teachers described feeling overwhelmed by the volume of information, particularly during the MOOC phase, and called for more streamlined content.

Time-related issues also surfaced, mostly in terms of the online training’s length and structure. The training was perceived by some as time-consuming, with short deadlines or overlapping tasks that limited deeper engagement or reflection.

Finally, teachers pointed out **format-related limitations**, especially concerning the online phases. Specifically, they expressed a preference for face-to-face engagement, noting that online environments did not provide the same level of interaction and feedback. A few also struggled with the usability of the digital platform employed during online training.

5.3.4 Teachers perceived opportunities for the SpicE training program

Understanding the opportunities identified by teachers is crucial for supporting the adaptation of the SpicE training program in new settings. These opportunities reflect not only the resources and infrastructures that can enable wider adoption, but also the ways in which the program can be strategically expanded. For educators and institutions looking to adopt or adapt SpicE in new contexts, these insights suggest both potential partners and avenues for collaboration, as well as strategies for long-

term impact. In the list below, we present the themes concerning opportunities, along with the underlying categories and representative quotes from participants.

Empowering Educators through Networks and Collaboration

Enabling teachers to learn from each other, share, and work within peer-driven structures

- **Categories:**
  Leverage existing teacher networks (9)
- Peer learning (5)
- Communities of practice (7)
- Create teacher networks (3)

Representative quote:
""There aren't any networks in Greece. It's important to establish networks between schools, universities and teachers" [Greek teachers]

Aligning SpicE with Systemic and Institutional Contexts

SpicE is seen as scalable through curriculum alignment, institutional integration, dissemination strategies — and must be supported by motivating structures like recognition and incentives.

- **Categories:**
  Curriculum integration (9)
- Inter-institutional collaboration (8)
- Incentives (5)
- Leverage existing professional development structures (3)
- Leverage existing support structures (2)

Representative quote:
"Through the schools year trainings, we could share through specific educational organizations for teachers such as CEFIRES, universities, etc. in order to expand this knowledge among our coworkers" [Spanish teachers]

Equipping Teachers with Resources and Tools

Teachers need practical, contextualized, and adaptable resources — both new and already available.

- **Categories:**
  Develop resources (12)
- Digital and physical infrastructure (5)

- **Representative quote:**
  " Creating a virtual library with ready-to-use lessons and other resources" [Bulgarian teachers]

Leveraging External Ecosystems for Sustainability

SpicE can align with international and EU platforms and opportunities to scale impact and secure resources.

Categories:
EU/international scaling & funding (7)
International partnerships (4)

Representative quote:
"SpicE could be adapted in many different ERASMUS+ projects" [Spanish teachers]

Sustaining Impact over time

SpicE requires sustained engagement through structured mentoring and institutional reinforcement. Ongoing dissemination ensures the training program remains visible, adaptable, and supported.

Categories:
Teacher professional development (12)
Follow-up structures (11)
Dissemination actions (7)

Representative quote:
" We are suggesting m*entoring follow-up meetings to discuss implementation of certain examples presented during the SpicE training" [Cypriot teachers]*

Across five distinct themes, teachers highlighted the importance of leveraging networks and external infrastructures, aligning the training with educational contexts, and integrating it into long-term professional development actions. These themes emerged from teachers' experiences during the different phases of the SpicE training program and suggest how the program's core strengths can be amplified through alignment with institutional and national priorities, support structures, and international collaborations.

The first theme emphasizes the importance of **networks and collaborative structures** in upscaling the SpicE training program. Teachers identified as a core strength of the program the activities that encouraged ongoing learning and sharing (see Strengths section). Therefore, expanding such opportunities was seen by many teachers as a crucial step for upscaling, extending beyond the initial training. **Leveraging existing teacher networks** (e.g., eTwinning, national associations) or **creating new ones** was suggested by teachers from all participating countries. **Peer-supported learning** (such as having teachers as ambassadors to train their peers) and the **development of communities of practice** that can drive localized adaptation were also strongly recommended. For instance, a group of Cypriot teachers mentioned that "each of us who participated in this training program will be able to educate peers. We should keep it going! Maintain the dynamic created by the implementation of the SpicE activities and research-based teaching strategies". Networks and CoPs can focus on a variety of topics, including sharing inclusive STEAM lesson plans, co-designing project-based learning modules, and collaborating on classroom-based initiatives. To effectively create and sustain these networks and communities of practice, it is essential to embed them both as part of the training and as ongoing post-training structures for sustainability and continued learning — a practice that will be followed for the SpicE project as well. During the training itself, dedicated sessions for network-building — such as collaborative hands-on workshops or peer-mentoring groups — can help lay the groundwork for evolving them into more permanent structures. These may include integration with existing networks or the formation of entirely new networks that support localized adaptation and innovation.

Teachers identified broader systemic and institutional opportunities to **embed the SpicE training program within existing national or regional educational structures and priorities**, ensuring relevance and acceptance within different

contexts. Teachers saw potential in linking SpicE to larger systemic reforms or policy priorities. For instance, a group of Spanish teachers reported that in their national curriculum "…it is mandatory to develop STEAM projects as a way to foster our students' learning process" and also, that regulations concerning inclusion exist in their region. Therefore, the SpicE training can support Spanish teachers by providing methodologies and adaptable resources to meet these curriculum mandates effectively. Greek teachers suggested that initiatives such as the experimental schools can support the implementation and expansion of the training program, while Bulgarian teachers mentioned that the initiative of STEAM classrooms in their country underscores the need for further training in Inclusive STEAM education. In addition, teachers highlighted the importance of **incorporating incentives** — such as certifications and official recognition — to motivate engagement and strengthen the program's credibility within these educational systems.

Beyond curriculum alignment, the upscaling of the program could also be accomplished by integrating aspects of the SpicE training into **official training actions** or embedding it within **national support networks** to promote long-term adoption and access to ongoing professional development opportunities. For instance, organizations such as CEFIRES in Spain or the Pedagogical Institute in Cyprus could integrate aspects of the SpicE training program that align with their priorities, providing structured pathways for teachers to develop inclusive STEAM practices.

Teachers from all countries also saw potential in building **inter-institutional collaborations** to expand the reach and adaptability of SpicE. These collaborations include partnerships with universities, scientific associations, NGOs, and even private initiatives that can offer complementary resources, expertise, and platforms for practical implementation. For instance, Greek teachers suggested that science centers, STEAM competitions etc. could be leveraged to support the dissemination and upscaling of inclusive STEAM practices in their country.

The third theme emphasizes the need to equip teachers with practical resources and infrastructure to ensure the successful implementation and long-term sustainability of the SpicE training program. Teachers across all countries consistently highlighted the value of developing **adaptable, context-specific resources**—such as lesson plans, assessment tools, ready-to-use activities, and digital resources—that can directly

support them in integrating inclusive STEAM pedagogies into their daily teaching. While the training already provided some resources, teachers saw significant opportunity in expanding these materials and tailoring them to local educational realities and needs. This theme also underscores the importance of **digital and physical infrastructure**: teachers recognized that adequate tools (e.g., digital platforms, STEAM labs) and access to technology are essential to deliver inclusive and engaging lessons. For example, Bulgarian teachers suggested "creating a virtual library with ready-to-use lessons and other resources," reflecting the need for accessible materials that can support implementation across diverse school contexts. Equipping teachers with these resources and tools not only supports their immediate teaching practice but also enhances their confidence and readiness to become inclusive STEAM educators over time.

Another suggestion from teachers was to leverage external ecosystems, partnerships, and funding to support both the sustainability and upscaling of the SpicE training program. Teachers emphasized the potential of tapping into **EU and international funding and platforms** (e.g., Erasmus+, Horizon Europe) to secure financial backing, gain access to established networks, and integrate SpicE within a broader European educational context. Beyond funding, teachers also highlighted the need to **build new international partnerships**—between schools, universities, educational associations, and other stakeholders—as a way to establish connections and align SpicE with evolving educational priorities. As a group of Cypriot teachers noted, "…SpicE should be implemented in countries with a similar educational landscape. For example, all four countries faced common challenges such as: curriculum, available tools, etc.".

The final theme centers on sustaining the impact of the SpicE training program over time. Teachers across all participating countries emphasized the need for **ongoing professional development** as an essential element for deepening their understanding of inclusive STEAM practices and maintaining the momentum and relevance of the training. Continuous professional development was strongly tied to suggestions for **flexible and accessible training formats**—including hands-on opportunities, in-school professional development, and free or low-cost options that respect teachers' schedules and available resources. Teachers stressed that these professional development efforts should incorporate **follow-up structures** to support ongoing implementation and help them address emerging needs in their teaching

practice. Mentoring was the most frequently mentioned follow-up structure, seen as a vital way to support teachers in refining and adapting their inclusive STEAM practices. Additionally, **dissemination actions** were recognized as important for broadening the program's reach. Teachers suggested activities like national conferences, online showcases of good practices, and sharing of success stories to keep SpicE visible and relevant.

5.3.5 Teachers perceived threats for the SpicE training program

Understanding the threats identified by teachers is essential for mitigating potential challenges in scaling and sustaining the SpicE training program. These threats highlight both systemic and institutional barriers, as well as context-specific factors that may hinder adoption or long-term integration. For educators and institutions considering implementing SpicE in new contexts, these insights serve as cautionary points, underscoring the need for thoughtful adaptation and risk mitigation strategies. In the list below, we present the three themes concerning threats, along with the underlying categories and representative quotes from participants.

Practical Implementation Issues	School-level or cultural conditions that may limit effective upscaling if not addressed. These reflect the readiness and openness of institutions and individuals to train and integrate new pedagogical approaches.

Categories:

School level barriers (12)

- School-based inclusion challenges (3)
- Resistance to change (8)

Representative quote:

"We have a lot of students per classroom, we host new students along the year with a lot of frequency which hinders the follow-up of the programs, we lack teachers and educators to support students with needs, etc." [Spanish teachers]

Broader Challenges that Shape Implementation	Broader national or regional education system challenges that can hinder the scalability of the program and that exist beyond the control of implementers and require strategic alignment or policy-level adaptation.

Categories:

Curriculum constraints (12)

- Variations in educational systems (7)
- Educational policy barriers (6)

Representative quote:

"The *curriculum in our country is more structured, so there are no great opportunities for project-based and hands-on activities" [Cypriot teachers]*

Training Quality and Sustainability	Threats to the sustainability and quality of the training program during upscaling. These relate to quality assurance, funding continuity, and the capacity to deliver consistent training at scale.delivery.

Categories:

Training quality (12)

- Need for sustained funding (8)
- Support networks (3)
- Train the trainers (3)
- Language issues (3)

Teacher readiness (3)

- **Representative quote:**

" Teachers hold different *educational norms and have different language and communication styles.* Also, they might *have limited knowledge of concepts, as well as of relevant technology and equipment" [Greek teachers]*

Teachers identified three major themes encompassing a range of categories that highlight systemic, institutional, and training-specific challenges. These insights are crucial for educators and institutions considering the adaptation or upscaling of the SpicE training program, as they underscore areas requiring proactive planning and risk mitigation to ensure sustainable impact.

The first theme, **practical implementation issues**, reflects the immediate, context-specific challenges that teachers face in applying the training in their own classrooms. Teachers described how factors such as overcrowded classrooms, insufficient support personnel, student turnover challenges, and even teaching staff instability can create obstacles for implementing new inclusive STEAM practices. For example, Bulgarian teachers noted that "it's difficult to implement inclusive education in bigger classes," highlighting how class size can limit the effectiveness of individualized or project-based teaching methods. Additional barriers included a restrictive curriculum, lack of equipment, and limited opportunities for teacher training, all of which further complicate efforts to put new ideas into practice. Some teachers also expressed concern that deeply ingrained practices in their schools might hinder the adoption of new methods, with resistance to change cited as a significant barrier. These threats suggest that for successful upscaling, any adaptation of the SpicE training should consider practical support strategies—such as adaptable resources and collaborative planning time—that acknowledge these everyday classroom realities.

The second theme, **broader challenges that shape implementation**, encompasses systemic and institutional factors that go beyond the immediate classroom and may limit the feasibility of scaling SpicE. This includes *curriculum constraints*, *variations in educational systems*, and *educational policy barriers*. Teachers noted that restrictive national curricula, differences in how educational systems structure teacher training, and rigid policies can all complicate the adaptation of the SpicE training program. For instance, a group of Spanish teachers described how the variance in educational policies across regions in Spain creates additional adaptation challenges. These findings suggest that alignment with national or regional educational frameworks—and proactive policy advocacy—should be central to any upscaling strategy for SpicE.

The final challenge posed by teachers that might hinder upscaling concerned **program-related factors** that could hinder long-term engagement and scalability if not addressed. Teachers stressed that inconsistent delivery, limited expert feedback, and a lack of structured follow-up could undermine the training's impact and effectiveness in different contexts when scaling the training program. Additionally, the need for active monitoring and support networks was seen as crucial to ensure that the quality of

training remains high across diverse educational settings Teachers also emphasized the importance of **train-the-trainer actions** will be needed to effectively prepare the educators and facilitators who will deliver the SpicE program. This includes ensuring they are equipped to support teachers during implementation and to adapt the program to their specific institutional contexts. Additionally, they noted that attention to the **characteristics of the target group** is essential, including **language considerations** and **teacher readiness** (particularly regarding digital skills), to ensure the training is accessible and relevant. Finally, **sustained funding** through EU initiatives or national resources was seen as crucial for maintaining the program's quality and supporting its long-term expansion to new contexts. These insights underscore the importance of quality assurance processes, strong mentoring and follow-up structures, and adaptable support mechanisms to ensure that training content and methods remain consistently effective and relevant in diverse educational environments.

5.4 Guidelines and recommendations for upscaling the SpicE training program: A SWOT-based tool

The final section of this deliverable presents a comprehensive overview of the key considerations, challenges, and potential strategies for upscaling and optimizing the SpicE training programme. Drawing on insights from the SWOT analysis (see section 5.3) and supported by the post-surveys, focus groups and data deriving from the D4.2 Unified Evaluation Report, this 4x4 grid consolidates the implications identified in Strengths, Weaknesses, Opportunities, and Threats dimensions.

This methodological tool is designed to support educators and institutions seeking to adopt or adapt the SpicE training program in new contexts. It highlights not only the internal strengths and challenges of the training itself, but also the external factors that can enable or hinder its successful implementation and sustainability. While some of these points represent areas for enhancement or adaptation, others identify critical risks that should be proactively managed to ensure the program's long-term relevance and impact. By presenting these considerations in a structured format, the grid serves as a roadmap for decision-making, allowing stakeholders to reflect on how best to tailor SpicE training programme to their specific needs and educational settings.

Even though the data collected across all training phases of the SpicE training programme consistently underscore its adaptability and perceived relevance across educational participant groups and countries, findings also indicate that local educational structures and policies shape the level of the adaptability and upscaling opportunities. Such findings confirm the need for further contextualisation when adapting the SpicE training programme across diverse contexts. These variations—captured both through survey responses and qualitative focus group insights—underscore the importance of tailoring implementation to fit national curriculums, educational policies, institutional realities, and systemic structures. Therefore, the following recommendations and guidelines can act as a starting point for both strategic planning and collaborative discussions about how to integrate the SpicE training programme into diverse contexts.

RECOMMENDATIONS BASED ON IDENTIFIED STRENGTHS	RECOMMENDATIONS BASED ON IDENTIFIED WEAKNESSES	
• Preserve **collaboration and peer-sharing opportunities**, particularly those that support multicultural exchange and cross-institutional dialogue. • Emphasize **practical application** by linking content directly to teachers' real classroom needs and support implementation through examples and concrete resources. • Retain **experiential learning** across all formats of the training — including online, blended, and face-to-face — with a particular emphasis on **hands-on activities** during in-person training. • Foster **reflective practice** (individually and collaboratively) throughout the training to cultivate inclusive, student-centered mindsets. • Recognize and support the **development of intercultural competences and soft skills** as part of the learning process. • Maintain a **coherent and accessible training structure**, ensuring clear sequencing between phases (MOOC, blended, exchange) and embedding consistent support and guidance throughout either through peer support structures or support from instructors.	• **Strengthen classroom applicability** by embedding more examples and adaptable resources tailored as much as possible to the educational system and national curriculum of participants (e.g., ready-to-use examples, adaptable lesson plan templates, case studies, school visit recordings). • **Streamline and structure content**, particularly in online phases. This may involve breaking down or omitting some modules, eliminating redundancy, or pacing delivery more gradually, depending on factors such as time constraints and participants' prior knowledge and needs. • **Link and evolve learning activities across training phases** (e.g., start a project or lesson plan online and complete or present it during the mobility phase) to foster continuity and engagement. • **Balance digital and face-to-face interaction**, ensuring that online learning includes collaborative components, and opportunities for feedback. • **Acknowledge time constraints** by offering flexible training timelines and workload expectations that reflect teachers' schedules as much as possible.	**Optimization**
RECOMMENDATIONS BASED ON IDENTIFIED OPPORTUNITIES	**RECOMMENDATIONS BASED ON IDENTIFIED THREATS**	**Upscaling**
• **Leverage existing teacher networks and communities of practice** to embed the training into ongoing collaborative structures that support peer learning. This includes integrating network-building into the training itself and supporting the formation of localized networks as post-training activities.	• Recognize the potential challenges (and the subsequent need for support) posed by **practical implementation barriers** within schools, such as overcrowded classrooms, student diversity, limited equipment, and restrictive curricula.	

• **Align the training with national or regional education priorities** and connect it to institutional pathways (e.g., official training providers, national resource hubs) to ensure relevance and legitimacy in different contexts. • **Develop adaptable, context-sensitive resources** (e.g., lesson plans, assessment tools, digital content) that reflect local teaching realities. • **Utilize EU and international funding and platforms** (such as Erasmus+, Horizon Europe) to secure financial support and foster international partnerships that can expand the program's reach and ensure sustainability. • **Embed flexible ongoing professional development structures**, including follow-up structures such as mentoring, to help teachers sustain and deepen inclusive STEAM practices over time. • **Promote dissemination actions** (such as national or local conferences) to keep SpicE visible and support adoption.	• Be aware of the **systemic and policy-level constraints** that might limit alignment with national or regional educational frameworks, including variations in teacher training structures and rigid policy settings. • Anticipate the need for **train-the-trainer initiatives**, which must account for issues such as diverse teacher readiness levels and language differences across settings. • Factor in the requirement for **sustained funding and external support** (such as from EU initiatives or national resources) to ensure long-term viability and consistent quality of program delivery. • Understand that the success of upscaling may hinge on establishing **strong institutional support structures**—including monitoring, mentoring, and expert feedback—to ensure that the training remains adaptable and relevant in each new context.	

Below, we provide a synthesis of the four SWOT dimensions and their implications for institutions or educators seeking to adopt or adapt the SpicE training programme, drawing on the triangulated insights from quantitative and qualitative evaluation data.

5.4.1 Supporting Practical Application through Contextualisation and Adaptable Resources

The post-survey data presented in Deliverable 4.2 indicate that 84% of MOOC participants reported feeling confident in applying the knowledge gained, suggesting strong alignment between course content and classroom needs. Teachers particularly valued the programme's emphasis on adaptable lesson plans and inclusive STEAM strategies, noting the acquisition of practical tools directly relevant to supporting students with learning difficulties. This perception of practical utility was further reinforced in qualitative data, where participants highlighted the programme's contribution to their confidence and readiness to implement inclusive practices.

These findings are echoed in the SWOT analysis conducted during the Cyprus exchange programme, where hands-on training was consistently cited as one of the most valued aspects of the face-to-face phase. Participants emphasized the benefit of collaboratively designing inclusive STEAM lesson plans, stating that co-creating teaching activities offered not only professional insight but also transferable resources for national and local classroom contexts.

However, the same data also pointed to a need for greater contextualisation of materials. Both in the exchange focus groups and in open-ended survey responses, participants called for more localized and ready-to-use resources, including assessment tools, lesson templates, and contextual case studies tailored to specific national curricula and school environments. Such resources were seen as essential to translating inclusive STEAM principles into actionable strategies, especially in settings with limited support infrastructure.

To address this need, educators and institutions seeking to adopt or adapt the SpicE training programme are encouraged to integrate contextualised resources into each training phase. This may include the development of regional content repositories, translated materials, and short video case studies that illustrate inclusive STEAM practices in real-world classrooms. Flexible task templates and modular lesson designs can further support adaptation to diverse curricular and policy contexts, while

maintaining fidelity to the programme's pedagogical aims. Notably, participants in D4.2 suggested including visual exemplars, such as school visit recordings, to better illustrate effective implementation and provide tangible models for application. Finally, teachers from the "Other Countries" category in the post-surveys often noted that language accessibility could limit implementation unless materials are offered in local language(s). Thus, institutions adapting the training programme should consider translating core content.

5.4.2 Maintaining Coherence While Allowing Flexible Implementation

The multi-format structure of the SpicE training programme—combining asynchronous online learning, synchronous blended formats, and in-person mobilities—was widely appreciated across participating countries. As documented in both D4.2 and the SWOT analysis from the Cyprus exchange programme, this scaffolded progression from theory to practice was consistently highlighted as a key strength. The sequencing of phases allowed participants to build foundational knowledge, gradually deepen their pedagogical understanding, and then apply inclusive STEAM strategies in practical, collaborative settings.

Particularly during the mobility phase, teachers described hands-on group tasks, such as co-creating inclusive STEAM lesson plans, as pivotal for operationalizing theoretical knowledge. These activities provided not only experiential learning but also a sense of confidence in applying inclusive strategies in their own classrooms. Several participants identified these tasks as the turning point in understanding how to meaningfully integrate inclusion into STEAM teaching.

Teachers also reported that maintaining coherence between phases was key. Inconsistent training delivery, especially in online components, was identified as a threat to scalability if not carefully managed. In addition, as highlighted in D4.2, while the MOOC and blended phases were considered foundational, suggestions were made to streamline theory and strengthen the integration between phases to further enhance coherence and impact. Moreover, teachers participating in the focus groups, emphasized the need for monitoring and quality assurance mechanisms, particularly in contexts where the training is delivered at scale. Institutions aiming to replicate or extend the SpicE training programme should consider designing training pathways that maintain clear thematic and pedagogical continuity between phases, while also

embedding flexibility (e.g., optional tracks or role-specific pathways) that respond to the needs of local teachers.

To preserve coherence while allowing for local adaptation, future implementations of the SpicE training programme should consider thematic continuity, pedagogical alignment, and flexible modular design. Optional learning pathways tailored to specific professional roles or levels of teaching experience—such as separate tracks for pre-service versus in-service teachers—could accommodate diverse contexts while preserving the programme's core structure.

In addition, fostering reflective practice throughout all phases of the training was frequently emphasized to strengthen both individual learning and collaborative development. Participants valued the opportunities for structured reflection—both individually and with peers—as a means of consolidating knowledge and cultivating a student-centred, inclusive mindset. Embedding regular reflection points, such as discussion prompts, self-assessment tools, and guided peer exchanges, can further enhance coherence across training stages and reinforce the programme's pedagogical aims. Reflection activities can also serve as a bridge between theoretical learning and classroom application, helping educators adapt strategies to their unique contexts while maintaining alignment with inclusive STEAM principles.

5.4.3 Leveraging Collaboration, Multicultural Exchange, and Professional Networks

One of SpicE's most valued dimensions was its emphasis on collaboration and peer learning. The evaluation results presented in D4.2 additionally confirm this core strength: 73% of MOOC participants appreciated the opportunity for peer interaction, while during the mobility phase, many described the intercultural collaboration as both enriching and inspiring. Moreover, focus group participants consistently referred to the mobility phase as a powerful moment of intercultural and interdisciplinary exchange. Teachers spoke of acquiring soft skills—such as adaptability and intercultural communication, which we consider critical for inclusive teaching. This suggests that peer-based learning is not only motivating but contributes significantly to professional growth.

At the same time, the exchange programme focus groups identified a risk in losing this dynamic when upscaling. Institutions should prioritise collaborative activities (e.g., co-creation tasks) and spaces (e.g., discussion forums) to support sharing and collaboration. Teachers' responses also point to the importance of preserving and expanding collaborative structures, such as communities of practice, mentoring groups, and teacher-led local hubs. Post-training dissemination events that allow for shared ownership of the training content and its outcomes was also a recommendation of teachers. Many participants emphasized that working in a diverse, real-world setting deepened their understanding of inclusive practices and broadened their perspectives. Intercultural collaboration may be replicated at national or regional levels by connecting teachers from diverse institutional or linguistic settings.

5.4.4 Addressing Institutional Constraints and Policy Barriers in Local Adaptation

Teachers, especially those participating in the focus groups during the Cyprus exchange programme, identified systemic and institutional barriers that may hinder the effective adaptation of the SpicE training programme. These included restrictive national curricula, fragmented or inconsistent regional education policies—with Spain frequently cited as a case where policies differ significantly across regions—and a lack of institutional incentives for teachers to implement new practices. These findings echo qualitative responses from the blended learning and MOOC post-surveys (D4.2), where participants noted limited recognition or integration of inclusive STEAM education within national systems as a critical impediment to implementation.

To navigate these challenges, the local adaptation of the training programme should incorporate a policy mapping stage. This step would allow to assess where the programme's pedagogical objectives align—or potentially conflict—with national or regional curricula, professional development actions and agendas, and current policy initiatives. In several cases, opportunities for alignment were noted by focus group participants: for instance, Bulgaria's STEAM initiatives and Greece's "experimental schools" offer entry points for institutional collaboration and adaptation.

Moreover, the need for strategic partnerships was a recurring recommendation across all data sources. Both post-surveys and focus group participants highlighted the value of engaging with different stakeholders such as policymakers, schools, universities,

and education providers to boost the credibility, visibility, and institutional uptake of the programme. Such partnerships are not only instrumental in navigating the aforementioned challenges, but also in building long-term sustainability. Partnerships can facilitate the endorsement of the training at national or regional levels and support its integration into existing professional development initiatives.

Teachers also consistently emphasized that institutional change cannot be sustained without corresponding investment in both material and human resources. A key finding from both the surveys and focus groups was the need for sustained funding to support implementation, follow-up, and continuous professional development. Thus, adaptation plans should consider both national and EU-level funding mechanisms as part of a broader strategic plan for institutional integration.

5.4.5 Ensuring Capacity for Quality Training Delivery and Support

A final critical dimension emerging from the data concerns the capacity required to maintain high-quality training delivery as the SpicE programme is scaled across new settings. Teachers across all data sources—particularly in the SWOT analysis of the Cyprus exchange focus groups—consistently emphasized the need for well-prepared trainers who can uphold the programme's pedagogical approach while adapting it to diverse educational and institutional realities.

In particular, focus group participants highlighted the "train-the-trainer" model as essential for successful upscaling. Prospective trainers should be equipped with a deep understanding of inclusive STEAM pedagogies, and the ability to tailor content to different professional profiles, including both pre-service and in-service teachers. They should also be prepared to offer differentiated guidance, depending on participants' starting competence levels, their institutional roles, and local system constraints.

The development of adaptable trainer resources can support this process. These may include:

- Trainer guides detailing programme objectives and learning progressions
- FAQs and glossaries to ensure conceptual clarity
- Formative assessment rubrics that align with inclusive STEAM competences

- Sample facilitation scripts or annotated slides for interactive components

In addition, while 84% of MOOC participants felt confident applying what they had learned (D4.2), open-ended comments from the blended learning survey called for greater implementation support, including clearer guidance from instructors and ongoing mentoring. This finding echoes the broader need identified throughout the deliverable for follow-up structures and professional communities to sustain learning after the formal training concludes.

6. Conclusions

This deliverable set out to develop concrete, evidence-based recommendations for the optimisation and upscaling of the SpicE training programme. Drawing on a combination of survey findings, focus group data, and synthesis with prior evaluation outputs (D4.2), the deliverable offers a strategic framework to support educators, institutions, and policymakers in adapting the training to diverse national and institutional contexts.

Across all data sources, the SpicE training programme was perceived as a highly adaptable and impactful. Participants consistently praised its experiential learning approach, the emphasis on collaboration and peer exchange, and the progressive structure linking theory with practice. Nevertheless, sustainable and effective adaptation requires deliberate alignment with local needs, institutional capacities, and policy priorities.

The SWOT-based recommendation framework consolidates the programme's strengths, identifies areas for improvement, and outlines external opportunities and potential threats to consider in scaling efforts. It is a tool intended to guide institutions and educators in making informed decisions when localising the training programme. It aims to bridge evidence and action, ensuring the programme remains pedagogically relevant, inclusive, and adaptable in diverse learning environments.

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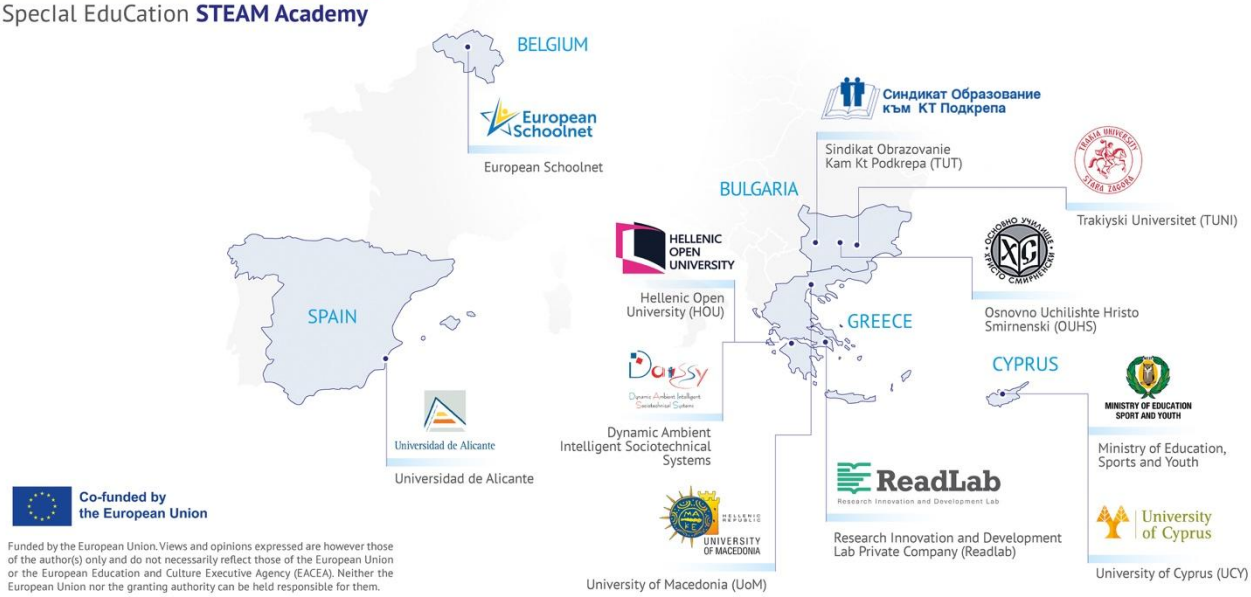

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