DigiBridge

ERASMUS+ COOPERATION PARTNERSHIPS
IN SCHOOL EDUCATION

DigiBridge research series

INCLUSIVE DIGITAL EDUCATION

International research report

DigiBridge
Digital tools for inclusive teaching

Bulgaria · Italy · North Macedonia · Türkiye

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CONTRIBUTING AUTHORS	Bulgaria: Lalo Kamenov, Niren Hasanova, Dafina Pandin Italy: Giorgia Marchionni North Macedonia: Biljana Bejkovska, Daniela Jovanovska Türkiye: Burcu Ülker, Cansel Hocaoğlu, Zeynep Konuk
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FOREWORD

Why this report exists

This research examines how digital teaching can support participation across different learners, tasks and school settings.

The DigiBridge partnership brought together four organisations in Bulgaria, Italy, North Macedonia and Türkiye to examine a practical question: can every learner take part in a digitally supported classroom task? Equipment matters, alongside accessible material, clear instructions and the support available during learning.

We asked teachers, school leaders, institutional stakeholders and students about their experience. A shared research framework combined a survey, adult interviews, learner focus groups and records of practice. The national contributions allow common needs to be considered alongside differences between settings.

Demand for professional development was high in every survey sample. Participants also described limited preparation time, uneven support and a need for materials that can be adapted to their classes. Learners emphasised demonstration, clear explanations, suitable devices and opportunities to ask for help.

Reading the evidence

The report describes the participating settings. Purposive recruitment and small samples limit national generalisation. Exact counts and valid denominators are retained so that readers can assess the basis of each comparison.

The documented practices show what teachers and schools report doing and the conditions needed to try a similar approach elsewhere. They have not been independently evaluated for causal effects on attainment, attendance or retention.

What comes next

The final chapters translate the findings into priorities for teaching resources and propose questions for classroom piloting. Selection, adaptation, accessibility guidance and learner feedback are central to that work.

We thank the adult participants, the 150 students and the national teams who contributed their time and experience. Their accounts give the partnership a practical basis for developing and reviewing its resources.

The DigiBridge partnership
Sofia · Foligno · Bitola · Istanbul

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EXECUTIVE SUMMARY

01

What the research found

Digital inclusion depends on whether learners can complete a meaningful activity with the support they need. Across the four contributions, participation is linked to accessible material, suitable equipment, clear teacher guidance and sustained institutional support.

ADULTS SURVEYED

93

Teachers, school leaders and institutional stakeholders in four countries

IN-DEPTH INTERVIEWS

30

Teachers, school leaders, policy and institutional stakeholders

STUDENTS

150

In 20 focus groups, aged between 11 and 16

DOCUMENTED PRACTICES

11

Practice records from fieldwork and programme documentation

Practical professional development

Between 76.0% and 94.1% of respondents in each country agreed that additional training on inclusive digital teaching is needed. These figures describe a shared development priority within the participating samples.

Different starting points

Agreement that teachers feel confident adapting digital tools ranged from 12.0% in Bulgaria and 17.6% in Italy to 38.5% in North Macedonia and 68.0% in Türkiye. Neutral answers were common in the Bulgarian and Macedonian samples and should not be interpreted as evidence of competence or its absence.

A foundation strand and an extension strand would allow teachers to begin from different levels of experience. The latter could include peer review and more demanding adaptation tasks.

Recurring approaches to adaptation

Participants described captions, audio explanation, readable text, manageable task steps, demonstration and different ways of showing understanding. These approaches should be included in the preparation of teaching materials and checked in use.

Learner feedback needs attention

Regular feedback was reported by 2/17 respondents in Italy, 10/26 in North Macedonia and 6/25 in Türkiye. The adaptation–feedback gap was evident in Türkiye: 13/25 reported frequent adaptation. Italy and North Macedonia had equal totals for the two items; this does not establish that the same respondents selected both.

Brief, accessible feedback can help identify difficulties that are not apparent from adult observation alone. The study did not measure the cost or effect of introducing such a routine.

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EXECUTIVE SUMMARY

01

What follows from it

Time and organisational support

Workload was reported as a barrier by 14/24 Bulgarian, 14/17 Italian, 17/26 Macedonian and 19/25 Turkish respondents. Agreement that institutional support is sufficient ranged from 34.6% to 60.0%. These findings concern respondents' own contexts and should not be treated as national policy assessments.

Training needs to be accompanied by feasible preparation time, reusable resources and access to help. Classroom trials should record the time and support actually required.

Accessibility in resource selection

Institutional and classroom accounts describe inaccessible documents, missing alternative text and videos without subtitles. They support examining accessibility when resources are selected and prepared, with individual adaptations where learners need them.

Different access problems

The accounts include shared household devices, smartphones unsuitable for extended work, maintenance problems and outdated vocational equipment. Other settings describe adequate access but a need for more purposeful use. Each requires attention to the task, the learner and the available support.

Scope of the findings

The research combines survey perceptions, adult interviews, learner discussions and practice descriptions. It can inform development priorities and local tests. It does not estimate national prevalence, assess teacher competence or establish causal effects of the documented practices.

Implications for the next phase

The partnership should connect practical professional learning with accessible materials, clear teaching guidance and learner feedback. Resource selection should examine how intended learners can participate before an activity is introduced. Feasibility and transfer remain questions for piloting.

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ABOUT THIS RESEARCH

02

What we wanted to know

DigiBridge is an Erasmus+ Cooperation Partnership in School Education. This report presents its research phase, examining inclusive digital teaching in Bulgaria, Italy, North Macedonia and Türkiye. The study is intended to inform the selection, adaptation and classroom testing of teaching resources.

Five research questions

1. How are digital tools used, and how does their use support participation by different learners?

2. What equipment, formats, skills and support are needed for a learner to complete a digitally supported task?

3. What do teachers need, and how do those needs differ between settings?

4. Which practices are described as useful, and what conditions would another setting need to reproduce or adapt them?

5. What changes at school, institutional and policy level follow from the evidence, and how could their effects be examined?

Comparing four contexts

The national contributions use a common framework while retaining differences in sample composition, language, school setting and support arrangements. Country results are presented separately with exact counts. They are not combined into a European score or used to rank education systems.

Participants and recruitment

Adults included teachers, school leaders and institutional or policy stakeholders recruited through partner networks. Learners took part in facilitated discussions in school settings. The achieved samples and their limitations are set out in the methodological overview.

Ethics and reporting

The common framework required information, voluntary participation, consent or assent and appropriate local arrangements. National partners were responsible for applying these procedures. Available records varied, so this synthesis does not claim an independent audit of all individual consent and authorisation records. Results are reported in aggregate or through anonymised paraphrases.

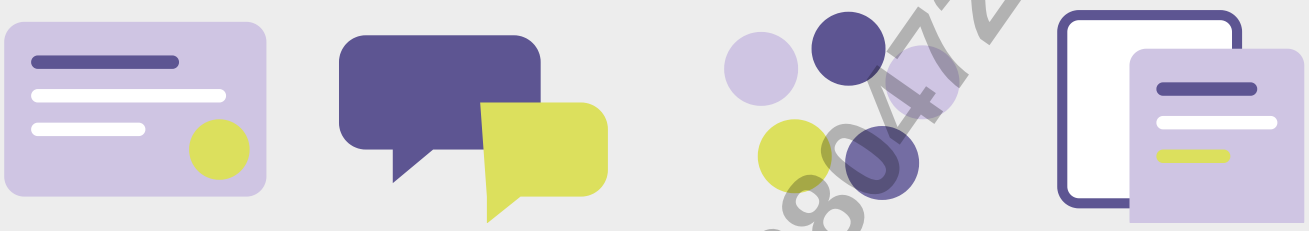
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ABOUT THIS RESEARCH

02

How we listened

The study combined four evidence streams. The survey describes patterns within the recruited sample; interviews explore context; focus groups add learners' perspectives; and practice records show how approaches are used in everyday classroom practice.



The survey

A common framework in four countries, with 93 adult responses on use, access, accessibility, confidence, training, conditions and feedback. Some final items differed in Bulgaria.

The interviews

Thirty semi-structured conversations with teachers, school leaders and institutional stakeholders, built around eight shared questions.

The focus groups

Twenty small groups, 150 students aged 11 to 16, talking about access, participation, support, barriers and what they would change.

The practices

Eleven practice records compiled from national fieldwork and programme documentation: the problem, the activity, and conditions for transfer.

Figure 1 What the research is built on. Each stream answers a question the others cannot.

How the evidence was handled

Thematic and instrument-level syntheses compare national reports and records. Qualitative themes are reported without pooled transcript-code frequencies. Convergence and contrasting accounts are retained; sources may overlap.

Percentages use valid item denominators. Bulgarian and Macedonian response exports and the Turkish coded workbook supported checks; Italy uses the corrected national aggregate. Chapter 09 brings the four instruments together.

Interpretation and limitations

Recruitment through partner networks provided purposive samples suited to identifying needs and practices. It does not support estimates of national prevalence. The adult survey and interview samples may overlap; the number of unique adult participants cannot be calculated from their totals alone.

The confidence item asks about teachers in the respondent's context. It is not an assessed competence score and is not necessarily a self-assessment. Practice descriptions report practitioner observations, with no independent causal evaluation. The next methodological page sets out achieved participation and further limits.

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METHODOLOGY

Evidence and achieved participation

The achieved samples below describe the evidence available for the international synthesis. Recruitment was purposive and coordinated by national partners.

Country	Survey	Adult interviews	Focus groups	Learners	Practice records
Bulgaria	25	11	6	42	3
Italy	17	6	4	40	2
North Macedonia	26	5	4	28	3
Türkiye	25	8	6	40	3
Total	93	30	20	150	11

Table 1. Achieved participation by country and method. Survey and interview participants may overlap; the adult totals should not be added to estimate unique participants. Sources: national research records and clarifications [R2-R5].

Comparability and analysis

The common methodology was adapted into national languages. The final Bulgarian items differed from the common questions and are excluded from the corresponding comparisons. One Bulgarian workload response was missing ($n = 24$). Italian results use a corrected aggregate; the other checks used response-level exports or the Turkish coded workbook.

Coverage and limitations

The Bulgarian survey is concentrated in one school. Italian learner groups averaged ten participants, above the recommended six to eight. Macedonian groups included 28 learners aged 15 and one explicitly identified as facing disadvantage. Turkish records did not provide aggregate inclusion-category counts. These features limit whose experience is represented.

Ethics and evidence limits

National partners were responsible for consent, assent and local authorisations. Türkiye supplied an implementation and ethics account; Bulgaria confirmed learner assent, while separate school and parental authorisations were not available for independent review in the analytical package. The synthesis does not claim an audit of every consent record. Participant accounts and case records describe experience, not causal effects.



A proposed route from research evidence to development and review. It does not depict results from completed classroom trials.

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THE FINDING IN ONE LINE

Having a device is not the same as being able to take part.

Five things have to be true before a learner can complete a digitally supported task, and a sixth has to be available when one of them fails. Equipment provision answers the first. This report is largely about the other five.

ACCESS AND PARTICIPATION

03

What access actually requires

Agreement on sufficient equipment access varies less between the four samples than agreement that learners facing disadvantage are considered in planning. These are separate survey statements, and their relationship does not establish causation.

Equipment access and inclusive planning

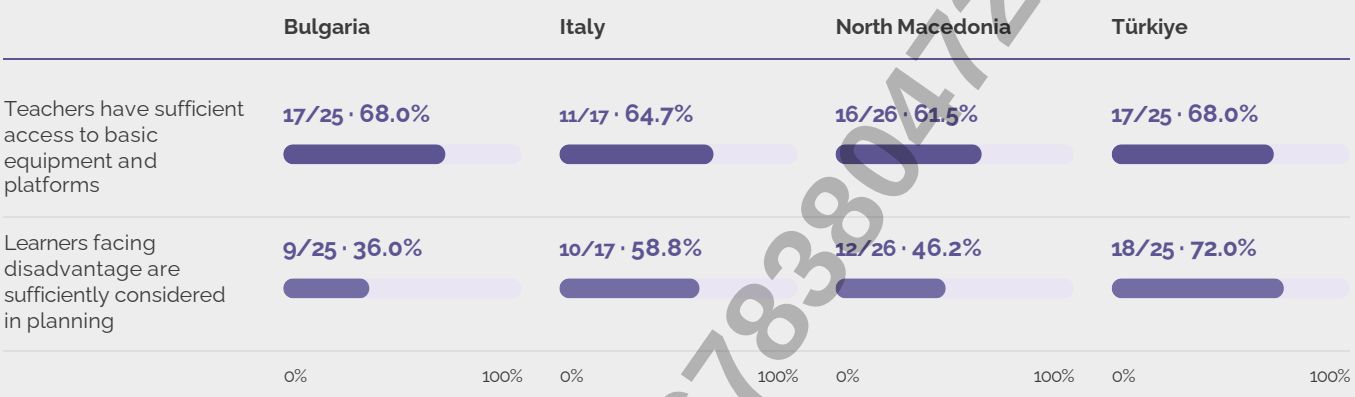


Figure 2 Equipment access and consideration of disadvantage in planning. Respondents agreeing or strongly agreeing.

All bars use the same scale. Counts and denominators appear above each bar. Country samples are purposive and are not compared as national rankings.

Agreement on sufficient equipment access ranged from 61.5% to 68.0%, a spread of 6.5 percentage points. Agreement that disadvantage is considered in planning ranged from 36.0% to 72.0%, a spread of 36.0 points.

The comparison suggests that access and inclusive planning need to be examined separately. It does not show why the patterns differ or establish how equipment is distributed beyond the participating settings.

Different access problems

Italian learners described the limits of smartphones for extended work and the effects of sharing household devices. Macedonian respondents raised maintenance and requests for school-owned devices and home connectivity. Turkish accounts included outdated vocational hardware and a specialist setting where the quality of use was a concern despite available equipment.

The Bulgarian practice of lending devices and supporting connectivity addresses one such constraint. In each setting, a task-level check can help identify the equipment, format and support needed for participation.

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ACCESS AND PARTICIPATION 03

Who faces barriers depends on where you ask

Respondents could identify several learner groups facing barriers. The answers differ between the participating samples. Their composition and local contexts should be considered when interpreting priorities for resource development.

Learner group identified	Bulgaria	Italy	North Macedonia	Türkiye
Special educational needs, disability or accessibility requirements	**20/25** 80.0%	**17/17** 100.0%	**10/26** 38.5%	**15/25** 60.0%
Socioeconomic disadvantage	**14/25** 56.0%	**4/17** 23.5%	**11/26** 42.3%	**16/25** 64.0%
Language barriers	**11/25** 44.0%	**7/17** 41.2%	**6/26** 23.1%	**8/25** 32.0%
Marginalised or minority background	**11/25** 44.0%	**3/17** 17.6%	**10/26** 38.5%	**4/25** 16.0%

Multiple responses were possible, so columns do not total 100%. Percentages are shares of respondents in that country. These are the perceptions of adult respondents about groups facing barriers; they are not counts of learners.

All 17 Italian respondents identified special educational needs, disability or accessibility requirements. Socioeconomic disadvantage was selected most frequently in the Turkish and Macedonian samples. Bulgaria recorded the highest shares for language barriers and for marginalised or minority background.

These are adult perceptions of groups facing barriers, not counts of affected learners. They do not establish the composition of national school systems.

Implications for design

Materials should support a range of needs: readable and navigable content, formats suitable for limited connectivity, and language support where required. Individual specialist provision remains important alongside these shared design choices.

Some features can support more than one need. Captions can help learners who cannot hear the audio and those learning the language of instruction. Printable alternatives can support access when connectivity is limited or screen reading is difficult. Suitability should still be checked with intended learners.

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ADAPTATION AND TEACHER CAPACITY

04

What adaptation looks like

Participants described several practical approaches to adapting digital learning. Their usefulness depends on the learning objective, learner needs and the guidance available.

Offer suitable formats

Examples include captioned video, audio explanation, text-to-speech, readable layouts, simplified parallel texts, visual instructions and accessible documents. Preparing shared materials in suitable formats can reduce repeated adaptation, while individual needs may require further changes.

Allow different ways to respond

Learners may demonstrate understanding through a presentation, audio or video, or written work. The teacher should retain a common learning criterion and provide guidance so that access to equipment or production skills does not determine achievement.

Demonstrate and support practice

Learners asked for demonstrations, clear explanations of a tool's purpose and opportunities to try it before independent work. Tasks can be divided into manageable steps, with opportunities to repeat an activity.

Use feedback that helps learning

Interactive exercises were valued for explanations as well as immediate responses. Feedback should help a learner understand an error. Self-paced work still requires a clear route to teacher assistance.

Match specialist support to the learner

A documented resource-centre practice combines mainstream material with individually selected communication, reading and sensory supports. Transfer requires specialist assessment where appropriate, staff preparation and maintenance arrangements. A list of devices cannot replace those decisions.

Adaptation choices for a learning task

Content formats

- Readable text
- Captions and audio
- Accessible documents
- Clear visual instructions

Learning steps

- Demonstration
- Manageable task stages
- Flexible pace
- Repeated practice

Response routes

- Written or spoken work
- Visual explanation
- Supported collaboration
- A shared learning criterion

Teacher guidance and accessible learner feedback throughout

Illustrative synthesis of approaches described in the national evidence. Select options according to the learning objective and learners' requirements.

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ADAPTATION AND TEACHER CAPACITY

04

Confidence and professional learning

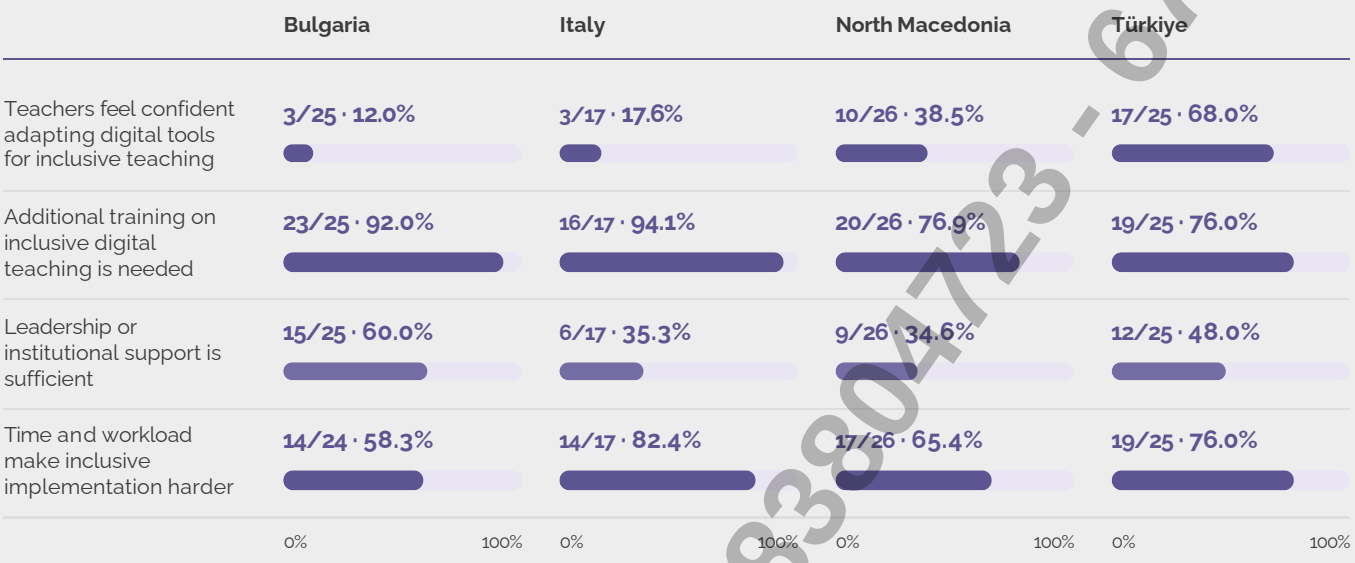


Figure 3 Confidence, demand for training, institutional support and workload.

Each row is a separate question with its own meaning. Higher agreement indicates confidence in the first row, demand in the second, sufficient support in the third and a barrier in the fourth. One Bulgarian respondent did not answer the workload question.

Training demand was high across the four samples, while confidence differed substantially. The comparison supports differentiated professional development and does not measure teachers' competence directly.

In Bulgaria, 14/25 respondents selected the middle of the confidence scale. In North Macedonia, 11/26 were neutral and five disagreed. These answers may reflect uncertainty or variation within the respondent's setting.

In Türkiye, 15 of the 17 respondents who agreed that teachers are confident also agreed that further training is needed. Confidence and demand for development can therefore coexist.

Two entry levels

A foundation strand can offer guided classroom examples and support with basic adaptation. An extension strand can use more demanding tasks and peer review. Needs should be checked with teachers before they enter either strand.

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CONDITIONS, CONTINUITY AND LEARNER VOICE

05

The conditions that decide what survives

Time for implementation

Between 58.3% and 82.4% of respondents reported workload as a barrier. Qualitative accounts describe preparation, finding or adapting accessible materials and resolving technical problems. These activities require time alongside ordinary teaching.

Reusable material and shared preparation may help. A brief record of the barrier, adaptation and learner response can inform improvement; any recording requirement should remain proportionate.

Institutional support

Agreement that support is sufficient ranged from 34.6% to 60.0%. In North Macedonia, nine respondents agreed, eight were neutral and nine disagreed. These perceptions refer to respondents' contexts and do not establish the quality of national policy.

Interviews described maintenance gaps, uncertain resource ownership, difficulty finding help and dependence on individual teachers. Schools should clarify who can support implementation and maintain the materials.

Continuity

Resources need arrangements for access, licences, technical maintenance and review after initial use. Existing software may offer support and updates, but its continued availability cannot be assumed. Costs, changed interfaces and service closure remain relevant.

Accessibility when acquiring resources

Institutional respondents argued for accessibility to be considered in the selection of materials, platforms and hardware. Classroom accounts identified missing alternative text, absent subtitles and documents that assistive technologies could not interpret.

Accessible procurement can reduce avoidable barriers, while teachers and specialists continue to adapt activities for particular learners. Responsibility should be shared across the people selecting, preparing and using the resources.

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CONDITIONS, CONTINUITY AND LEARNER VOICE

05

What the students said

The 150 learners in 20 focus groups described how digital tools fit into their school experience. Their accounts complement adult perspectives and remain specific to the groups who participated.

Guidance and purpose

Learners valued interactive and visual activities, including explanations that made abstract concepts easier to understand. They asked for a demonstration, clear instructions, an explanation of the activity's purpose and a way to obtain help.

Access at school and at home

Accounts described the value of teacher assistance at school, shared or unsuitable devices at home, technical problems, uneven digital skills, screen fatigue and too many platforms. Homework should account for the support and equipment actually available.

Whose experience is represented

The Macedonian groups included 28 learners aged 15 and only one explicitly identified as facing disadvantage. Turkish records did not provide aggregate counts by inclusion category. Positive accounts cannot establish that all learner needs were represented.

Emerging tools

Adults described AI-assisted accessibility as a candidate approach in an interview, alongside concerns about errors, online safety and balanced use. These accounts support careful classroom review and human responsibility; they do not validate an AI accessibility intervention.



Teacher support and suitable devices are part of the learning context.

Illustrative classroom photograph, not DigiBridge fieldwork.

Ronja Aigner and Michelle Kohlmeier, 2019. CC0 1.0.

Source: Wikimedia Commons Tabletunterricht 07

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PARTICIPANT PERSPECTIVES

Voices from the research

Teacher perspective · North Macedonia

Video with subtitles and audio explanation allows learners to use a format that suits them. Readable text and other accessible formats remain useful alongside it.

Learner perspective · Italy

Using a digital tool is easier at school when a teacher is available to help if something does not work.

Institutional perspective · North Macedonia

Documents, websites and platforms need suitable structure so that screen readers, voice control and alternative input can interact with them.

Learner perspective · Italy

The teacher should explain why a tool is being used before the activity begins.

Teacher perspective · North Macedonia

The availability of equipment needs to be accompanied by staff preparation in assistive digital technologies.

Learner perspective · Italy

Digital tools support study alongside the teacher, classroom interaction and explanation.

Teacher perspective · North Macedonia

School-owned devices, home connectivity support and an accessibility check for resources can address different barriers.

Teacher perspective · Italy

Complex platforms introduced without preparation or follow-up support caused problems. Using too many platforms also created confusion.

Learner discussions · Bulgaria

Interactive and visual activities were valued alongside teacher explanation and classroom dialogue.

School leadership · Türkiye

Available interactive boards need purposeful use. Old computers in vocational classrooms can remain an access constraint.

Anonymised paraphrases of participant accounts; these are not verbatim quotations.

Comparing the perspectives

Theme	Perspectives brought together	Implication for practice
Access	Macedonian institutional accounts emphasise accessible structure; Italian learners emphasise available help.	Check technical access and the guidance available during the task.
Participation	Bulgarian learners value interactive activity and dialogue; Italian learners ask for a clear purpose.	Connect digital activity with explanation, demonstration and discussion.
Implementation	Turkish school leadership describes equipment renewal and quality of use; Macedonian teachers request assistive-technology training.	Match equipment, preparation and support to the setting.

Editorial comparison of the paraphrases above. These accounts remain specific to the participating settings. [R2-R5]

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WHAT TEACHERS SAY THEY NEED

06

Training materials and family support

Respondents could select several forms of support. Training leads in Italy and North Macedonia. In Türkiye, adapted materials rank first, coordination with families second and training third.

Forms of support most needed

	Italy	North Macedonia	Türkiye
Teacher training	17/17 · 100.0%	19/26 · 73.1%	13/25 · 52.0%
Adapted materials	9/17 · 52.9%	17/26 · 65.4%	17/25 · 68.0%
Devices and connectivity	7/17 · 41.2%	9/26 · 34.6%	11/25 · 44.0%
Coordination with families	Not reported	6/26 · 23.1%	15/25 · 60.0%
School procedures	3/17 · 17.6%	4/26 · 15.4%	3/25 · 12.0%
	0% 100%	0% 100%	0% 100%

Figure 4 Forms of support selected as most needed. Multiple responses possible, so shares total more than 100%.

Each share is the proportion of respondents in that country who selected the option. The question was asked differently in Bulgaria and its answers are not comparable here. Italy's chart does not report the family-coordination option; it is left empty rather than recorded as zero.

Training was selected by 17/17 Italian and 19/26 Macedonian respondents. Adapted materials were selected by 9/17 and 17/26 respectively. In Türkiye, 17/25 selected adapted materials, 15/25 family coordination and 13/25 training.

The findings support combining practical professional development with usable materials, while retaining local priorities. Multiple selections mean that the categories overlap and cannot be added to estimate distinct groups of respondents.

Family and school arrangements

Family coordination was selected more frequently in Türkiye than in North Macedonia. This difference describes the participating samples; the study cannot determine how much arises from sample composition or wider context. Italy did not report this option in the comparative chart.

Few respondents selected school procedures. This does not establish that procedures are unnecessary. School arrangements remain relevant to the workload and institutional-support concerns described elsewhere.

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WHAT TEACHERS SAY THEY NEED

06

Adaptation and learner feedback

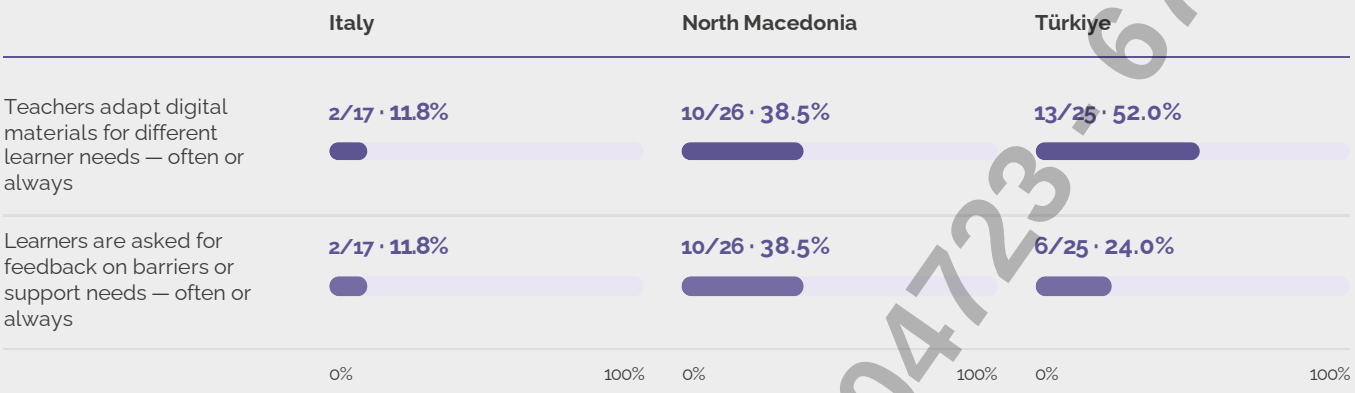


Figure 5 How often materials are adapted, and how often learners are asked.

"Often or always" combines the top two points of a five-point frequency scale. These are respondents' perceptions of frequency, not observations of lessons. The question was asked differently in Bulgaria and is not comparable here.

Regular learner feedback was reported by 11.8% to 38.5% of respondents in the three comparable samples.

The clearest difference appears in Türkiye: 13/25 respondents reported frequent adaptation and 6/25 frequent feedback. Italy and North Macedonia had equal aggregate totals on the two items. Equal totals do not establish that the same people selected both responses.

The survey identifies reported frequency. It does not show that adaptations were made solely from teacher observation or explain why feedback was less frequent in the Turkish sample.

Complementing teacher observation

Learners can identify difficulties involving devices, language, instructions or navigation that an adult may not see during a lesson. Accessible feedback provides an additional source of information when resources are reviewed.

A manageable routine

After an activity, ask what was clear, where help was needed and what would improve access. Offer more than one way to respond and include learners who could not complete the task. Record any change made after reviewing the answers.

Brief lesson feedback and periodic evaluation serve different purposes. Their timing and format should match the activity and the learners. The research did not measure the cost or effect of a particular feedback routine.

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COUNTRY PERSPECTIVES

BG

Bulgaria

SURVEY	INTERVIEWS	STUDENTS	PRACTICES
25	**11**	**42**	**3**
Adult respondents in one general school in Sofia	Adult stakeholders	Six groups, aged 11 to 16	Documented from the fieldwork evidence

The Bulgarian contribution is concentrated in one general school in Sofia, with 25 survey responses and 11 adult interviews. This provides a contextual account of one setting. It does not establish that everyone in the school participated.

What the numbers say

Regular use of digital tools and sufficient basic equipment both attract agreement from 17 of 25 respondents. Language barriers are identified by 17 of 25 — the highest figure in the consortium, and consistent with a multilingual intake. Accessibility barriers are identified by 14.

Only three respondents agree that teachers feel confident adapting tools, though 14 chose the middle of the scale rather than disagreeing. Demand for further training reaches 23 of 25.

Bulgaria records the consortium's highest agreement that institutional support is sufficient, at 15 of 25. That combination — comparatively strong perceived leadership support alongside low perceived adaptation confidence — makes it a useful contrast to the other three countries, and suggests that supportive leadership and practical capability are not the same resource.

What people described

The qualitative material is dominated by requests for practical adaptation, teacher support and interactive resources. Student accounts value immediate feedback and visual or game-based activities, while also emphasising explanation and dialogue with the teacher — the two are not presented as alternatives.

What Bulgaria contributes

Three practices were systematised from the national evidence: self-paced interactive platforms, choice of assignment format, and device lending with connectivity support. They address content, participation and equipment access through different mechanisms.

The device-lending practice is the clearest answer in the whole portfolio to the constraint that Macedonian and Italian participants described independently, and it is described with unusual honesty about its limits: it removes one access constraint, and cannot by itself resolve a skill, language or learning-support need.

The survey describes the participating school. Role categories for all adult interviewees were not reliably coded in the available package. Neither the survey nor the interviews can represent the Bulgarian education system.

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COUNTRY PERSPECTIVES

IT

Italy

SURVEY	INTERVIEWS	STUDENTS	PRACTICES
17	6	40	2
Teachers, school leaders and institutional respondents	Three distinct professional profiles	Four groups, aged 13 to 14	Documented school practices

The Italian survey includes seven teachers, seven school leaders and three institutional or policy respondents. Its role composition differs from the other national samples. The six interviews were with teachers representing three professional profiles.

What the numbers say

All 17 respondents identify special educational needs, disability or accessibility requirements as a group facing barriers, and all 17 select teacher training as a needed form of support. Sixteen agree that further training is needed. Only three agree that teachers feel confident adapting tools, and ten actively disagree — the clearest statement of a capability gap anywhere in the study.

Workload is identified as a barrier by 14 of 17, the highest rate in the consortium. Language barriers divide the sample almost evenly between agreement and the middle of the scale, which suggests their relevance varies considerably between institutions.

What people described

The interviews are the study's most instructive on why capability varies within a single system. One participant is an experienced teacher with an information-technology background and school-level responsibilities; three are rural teachers who describe their own digital competences as limited; two teach curricular subjects through a foreign language and use multimedia resources daily.

The experienced teacher adapts tools and solves technical problems independently. The others are less confident in selecting, modifying and troubleshooting digital resources, and the support reaching them arrives through occasional training and informal help from colleagues. The same school system produces both.

Italian accounts explicitly describe difficulties with complex platforms introduced without preparation or follow-up, and with too many platforms in use at once. These accounts inform the recommendations on supported implementation.

What Italy contributes

Two documented practices with unusual reach. One concerns rural lower-secondary schools working as a network, so that small and geographically isolated classes gain a wider learning community. The other concerns students producing accessible learning materials themselves, under teacher supervision, as a route into understanding rather than a display of technical skill.

Italy's learner evidence is the most explicit in the study about the difference between nominal and functional access, and it is the reason that distinction runs through this report.

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COUNTRY PERSPECTIVES

North Macedonia

MK

SURVEY	INTERVIEWS	STUDENTS	PRACTICES
26	5	28	3
21 teachers, three institutional or policy respondents, two school leaders	A teacher-mentor, two school leaders, two institutional stakeholders	Four groups of seven, aged 15	School-based practice records

North Macedonia contributes the largest adult sample in the study and, by some distance, the richest set of written answers: 25 of 26 respondents described a practical example of inclusive digital practice, and every one of the 26 named a priority barrier and a policy priority. Much of the qualitative texture in this report comes from that material.

What the numbers say

Nineteen of 26 respondents agree that digital tools are used regularly and 17 that their use supports the participation of different learner groups. Twenty agree that additional training is needed and 17 identify workload as a barrier.

On institutional support the sample divides exactly: nine agree, eight are neutral and nine disagree. It is the only even split recorded anywhere in the study, and the strongest indication in the Macedonian data that the constraint is organisational rather than technical.

Confidence in adapting tools stands at 10 of 26, with 11 respondents neutral — placing North Macedonia between the low Italian and Bulgarian figures and the higher Turkish one.

What people described

Three themes recur. The first is multi-format delivery: subtitled video with audio explanation, text-to-speech with adjustable type and contrast, accessible documents and presentations, and simulations that allow work at an individual pace regardless of location or family circumstances.

The second is the pairing of device access with home connectivity, expressed concretely as school-owned devices and mobile connectivity for families who need them, rather than as a general call for investment.

The third is the most distinctive contribution in the study: accessibility treated as a procurement and standards question. Respondents at institutional level argued that purchased materials, platforms and hardware should be accessible from the outset, and that this should be an obligation rather than a preference. Child online safety, screen time and the reliability of AI-generated content form a fourth, smaller theme.

What North Macedonia contributes

The national contribution presents three school-based practices: interactive quizzes with visual creation; mainstream resources combined with individually selected assistive technologies; and guided interactive worksheets with oral explanation and reading support.

Together they answer the demand that the same respondents expressed in the survey — for training in assistive digital technologies and for adapted material — with concrete examples from their own schools.

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COUNTRY PERSPECTIVES

TR

Türkiye

SURVEY	INTERVIEWS	STUDENTS	PRACTICES
25	8	40	3
Sixteen teachers and nine school leaders	Five teachers and three school leaders, the latter contributing as institutional stakeholders	Six groups	Documented on the common template, alongside further examples drawn from the interviews

The Turkish sample records higher agreement on teacher confidence than the other three samples. Its findings add a different perspective on training, support and adaptation within the participating settings.

What the numbers say

Regular use of digital tools attracts agreement from 18 of 25 respondents, accessibility barriers from 18 of 25 and additional training needs from 19 of 25. Teacher confidence in adaptation attracts agreement from 17 of 25 — a material difference from every other country in the study.

Fifteen of the 17 respondents who agreed that teachers are confident also agreed that further training is needed. The finding supports further development for experienced users as well as introductory provision.

Workload is reported as a barrier by 19 of 25. Thirteen respondents report adapting materials often or always, but only six regularly seek learner feedback — the widest gap between adaptation and consultation in the study.

What people described

The interviews distinguish equipment renewal and maintenance from the quality of use, and one specialist vocational school makes that distinction unusually concrete. Interactive boards are available across its classrooms and workshops, while the computers in three vocational classrooms are old and difficult to use. The school leader also observed that a board is not always used to its pedagogical potential — when attendance is low it may be used to show animations rather than for more individualised teaching. Availability and purposeful use are not the same achievement, and this is the clearest illustration of it in the study.

The same setting contributes two barriers no other partner documented: learners with more severe intellectual disabilities need more support to use digital tools independently, and heavy out-of-school digital use — social media in particular — was described as affecting students' sleep, attention and readiness for school. Digital inclusion, on this evidence, is also a question of meaningful and balanced use, not access alone.

Türkiye also records the consortium's highest demand for coordination with families, at 15 of 25 — a reminder that what counts as a support need is genuinely shaped by national context.

What Türkiye contributes

The widest range of documented approaches in the study: AI-assisted accessibility for learners with visual impairment, practical digital production with drones and 3D printing, gamified learning, interactive whiteboards and multimedia, digital project learning, teacher-guided digital activity, digital language tools, and vocational digital skills for learners with mild intellectual disabilities.

The contribution includes three full case records and additional approaches described in interviews and survey material. The different evidence types should be retained when considering transfer. An accessibility claim about an emerging technology requires review with intended learners.

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DOCUMENTED PRACTICES

08

Eleven documented practices

The portfolio contains eleven practice records compiled from national fieldwork and programme documentation. Each describes a participation problem, an approach and the conditions for using it elsewhere. The records provide examples for examination and adaptation; they do not constitute eleven independent evaluations of effectiveness.

How to read these

Each account answers four questions, and they are the four questions this report would put to any practice that claims to be inclusive.

What learning or access problem does it address? A practice that cannot name its problem is a technique looking for a use.

What must the learner be able to do? Every practice assumes something — a device, a reading level, a connection, a skill. Making that assumption explicit is what allows another teacher to judge whether it fits their class.

What support does it require? From the teacher, from a specialist, from the technical side of the school.

What would show that participation improved? Not whether learners enjoyed it, which they usually did, but whether more of them were able to take part.

One word carries a specific meaning throughout this chapter. *Transferable* means that an approach appears feasible in another suitable context. It does not mean that the same effect has been demonstrated elsewhere, and none of these practices has been independently evaluated for its effect on attainment or attendance. The judgement that they work belongs to the people who use them.

Software and platform names appear only where a practitioner named them in describing their own work. They are not recommendations, and nothing here should be read as advice to purchase anything.

1 **The problem**
The learning or access barrier

2 **The learner**
The skills and access required

3 **The support**
Teacher specialist or technical help

4 **The evidence**
How participation will be reviewed

Questions for transfer

Conditions to examine in transfer

Across the portfolio, the recurring considerations are purposeful learning tasks, teacher or specialist guidance, suitable resources and accessible participation routes. Their combination should be reviewed in each receiving setting. The study has not tested a universal set of sufficient conditions for inclusion.

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DOCUMENTED PRACTICES · BULGARIA

08

Three practices from one school

01 Interactive platforms and self-paced learning

The practice combines interactive exercises with immediate feedback and the opportunity to work at an appropriate pace. Its inclusion mechanism is a manageable sequence of tasks with visual support and repeated practice, accompanied by teacher explanation rather than replacing it.

A school considering it should check accessible navigation, the language and reading demands, the devices available, and above all whether the feedback helps a learner understand an error rather than simply recording it. Self-paced work still needs a route to teacher assistance, and that route has to exist before the activity begins.

02 Choice of assignment format

Learners demonstrate their understanding through a format they choose — a presentation, a video, a piece of written work. The transferable mechanism is flexibility in how the learning objective is met, with teacher guidance helping each learner select a format that is accessible to them and appropriate to the task.

Transfer requires shared assessment criteria and an equivalent low-bandwidth or non-digital route. A school should avoid grading production sophistication when the objective concerns subject understanding; otherwise the practice quietly advantages the learners with the better equipment at home.

03 Lending devices and supporting connectivity

The practice addresses unequal access directly by making a device or connection available to learners who would otherwise struggle to take part. It is an enabling arrangement rather than a teaching method, and its usefulness depends on whether the equipment suits the actual task and can be maintained.

A receiving school needs a practical lending process, technical support, accessible content and a plan for what happens when connectivity fails. The account is notably honest about the limits: the practice removes one access constraint and cannot by itself resolve a skill, language or learning-support need.

These three practices cover the three things this study identifies as necessary: accessible content, a route through the task, and the means to take part at all.

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DOCUMENTED PRACTICES · ITALY

08

Networks and authorship

01 Classi in Rete — collaborative learning across isolated schools

Rural lower-secondary schools in Abruzzo coordinate learning across small or geographically separated classes, combining shared activities with both live and asynchronous communication. The inclusion problem is specific and often overlooked: limited peer interaction and access to a wider learning community in very small schools.

The transferable element is the coordinated teaching design — joint preparation, a clear shared task, structured opportunities for interaction and several ways to contribute. A basic transfer can begin with a short sequence between two classes, using common learning objectives and materials that work with the connection and devices actually available.

Coordination time and teacher moderation are material requirements rather than details. Unequal connectivity, incompatible timetables or inaccessible content can undermine participation, and partners should agree fallback activities rather than assume that connecting classrooms automatically gives every learner an equal voice.

The account draws on documentation of an existing programme. Its value here is the mechanism it demonstrates, not a measured effect within this research.

02 Students as digital authors

At an upper-secondary institute near Naples, learners contribute to creating multimodal learning materials under teacher supervision. The approach began in a single language department and grew from there. It reflects Universal Design for Learning through varied ways to engage with material, access information and express understanding.

A feasible transfer is a single limited subject task in which learners produce an accessible explanation for their peers. The teacher retains editorial responsibility and sets the learning criteria. Captions, transcripts, readable structure and alternative formats belong in the production process rather than being added once the resource is finished — which is, in miniature, the argument this whole report makes.

Authorship gives learners a reason to explain and revise their understanding. It also creates barriers if it demands advanced devices, complex software or unsupported reading and writing. Scaffolding, shared roles within a group and a simpler alternative are essential, and rights to third-party text and images need checking before anything is published.

The practice is designed for all students rather than only for learners formally identified as having special educational needs, with disengagement and early school leaving named as an additional inclusion dimension.

Related framework: CAST Universal Design for Learning Guidelines [R8].

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DOCUMENTED PRACTICES · NORTH MACEDONIA

08

Three schools, three mechanisms

01 Interactive quizzes and visual creation

Interactive quizzes and visual production are used to encourage active response and to make learning more visual. The transferable mechanism is the combination of a clear question, feedback, and a supported opportunity to create or explain an answer — the creating matters as much as the answering.

Transfer requires device access, appropriate reading demands and an alternative participation route. One caution comes from the account itself: competitive speed should not become the criterion for successful learning, because the learners it excludes are precisely those the practice is meant to include.

02 Mainstream and assistive technologies together

A resource centre combines ordinary digital resources with assistive approaches selected around individual needs — communication, reading and sensory supports, including augmentative communication and specialist equipment where appropriate. The inclusion mechanism is individual fit between the learner, the task and the support.

A receiving setting needs specialist assessment, staff preparation and maintenance arrangements. Device selection must reflect the individual learner's needs and professional judgement. This practice relates directly to the demand for training in assistive digital technologies expressed in the Macedonian survey.

03 Guided interactive worksheets

A teacher-mentor creates or adapts interactive worksheets and combines them with oral explanation and reading support. The practice addresses three things at once: comprehension of instructions, motivation for practice, and uneven access to resources at home.

Transfer begins with a specific learning objective, a manageable worksheet, a demonstration, and an accessible alternative for when the platform or the connection is unsuitable. Teacher-created material can be reused and adapted — which is its main economy — but preparation time and the continuity of the platform remain real constraints.

Applying these approaches

These practices address participation in ordinary activities, individual support needs and teacher adaptation of materials. Their relevance depends on the learners, the task and the support available in a receiving setting.

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DOCUMENTED PRACTICES · TÜRKIYE 08

Approaches and evidence types

The Turkish evidence documents the broadest range of approaches in the study. Three are recorded as full case studies on the common template used across the partnership; the remainder are practical examples drawn from the interviews and the survey, described here because the mechanisms they illustrate are useful in their own right. The table distinguishes the approach, the participation mechanism described and the source of the account. Transfer requires review of the conditions in the receiving setting.

Approach	Inclusion mechanism described	Who described it
AI-supported accessibility	Support for learners with visual impairment	Teacher interview
Drones and 3D-printing workshop	Practical digital production and participation	Teacher interview
Gamified digital learning	Engagement through interactive tasks and immediate feedback	CASE STUDY
Interactive whiteboards and multimedia	Visualisation and supported classroom explanation	Survey, adult and student evidence
Digital project-based learning	Active and collaborative production around an authentic problem	CASE STUDY
Teacher-guided digital learning	Demonstration, support and structured use	Adult and student evidence
Digital language-learning tools	Individual practice, repetition and rapid feedback in an additional language	CASE STUDY
Digital tools in vocational training	Participation of learners with mild intellectual disabilities	School-leader interview

What the range tells us

The accounts cover varied approaches in the participating settings. The vocational example adds experience involving learners with mild intellectual disabilities. These descriptions cannot establish the direction of the Turkish education system as a whole.

It also illustrates a risk that Italian participants named directly: a school system can adopt approaches faster than it can support them. The Turkish survey's own finding that workload is a barrier for 19 of 25 respondents sits alongside this list, and the two should be read together.

A note on AI-assisted accessibility

One of these approaches deserves particular care. An accessibility claim attached to an emerging technology is still a claim, and it has to be tested with the learners it is meant to serve rather than accepted because of what the technology is called. The account should describe the access problem addressed and how usability was checked — which is the same standard this report applies to every other practice in the portfolio, and no higher.

Four questions for any transfer

Taken together with the other eight practices, the Turkish set suggests the four questions set out at the start of this chapter. What learning or access problem is addressed? What must the learner be able to do? What teacher, specialist or technical support is required? And what evidence would show whether participation actually improved?

These are proposed as a shared way of reviewing practice, not as a scoring system. Their purpose is to make the assumptions in a practice visible before another school inherits them.

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ANALYSIS BY INSTRUMENT

09

Survey: use and participation

The survey provides a descriptive comparison of 93 adult responses: Bulgaria 25, Italy 17, North Macedonia 26 and Türkiye 25. The analysis below separates reported use, inclusive planning and barriers. It complements the thematic figures with an instrument-level interpretation.

Agreement statement	BG n = 25	IT n = 17	MK n = 26	TR n = 25
Regular use of digital tools	17/25 68.0%	11/17 64.7%	19/26 73.1%	18/25 72.0%
Sufficient basic equipment access	17/25 68.0%	11/17 64.7%	16/26 61.5%	17/25 68.0%
Use supports different learner groups	13/25 52.0%	10/17 58.8%	17/26 65.4%	18/25 72.0%
Disadvantage considered in planning	9/25 36.0%	10/17 58.8%	12/26 46.2%	18/25 72.0%
Accessibility barriers are significant	14/25 56.0%	12/17 70.6%	14/26 53.8%	18/25 72.0%
Language barriers affect resource use	17/25 68.0%	7/17 41.2%	10/26 38.5%	9/25 36.0%

Table 2. Agree/strongly agree, with valid denominators. BG = Bulgaria; IT = Italy; MK = North Macedonia; TR = Türkiye. The first four rows describe provision or practice; the final two identify problems. Sources: [R2-R5].

Use and inclusive participation

Agreement on regular use is relatively close across samples (64.7-73.1%). Agreement that use supports different learner groups ranges more widely (52.0-72.0%). In Bulgaria, Italy and North Macedonia, the latter attracts fewer positive responses. This is an item-level contrast; it does not identify which respondents experience a gap.

Equipment and planning

Sufficient equipment access varies by 6.5 percentage points, compared with 36.0 points for consideration of disadvantage in planning. Similar agreement on equipment therefore accompanies different perceptions of inclusive planning. The survey does not explain the causes of this variation.

Accessibility remains a shared concern

A majority in every sample identifies significant accessibility barriers (53.8-72.0%), alongside majority agreement on sufficient equipment. These statements concern different dimensions of access and can coexist. Neither item measures whether a particular learner can complete a task.

Language changes the local priority

Agreement that language barriers affect resource use reaches 68.0% in Bulgaria, compared with 36.0-41.2% elsewhere. This identifies a priority in the participating Bulgarian setting. It cannot establish a national difference independent of recruitment or learner composition.

Key finding. Reported digital use provides a starting point for inclusion. The survey identifies additional needs in planning, accessibility and language support that equipment availability alone does not describe.

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ANALYSIS BY INSTRUMENT

09

Survey: capacity and support

The second set of indicators examines the conditions for adapting teaching. Confidence, training demand, sufficient support and workload are separate constructs. Their percentages should be read together without combining them into a single performance score.

Survey indicator	Bulgaria	Italy	North Macedonia	Türkiye
Confidence in adapting tools	3/25 12.0%	3/17 17.6%	10/26 38.5%	17/25 68.0%
Additional training needed	23/25 92.0%	16/17 94.1%	20/26 76.9%	19/25 76.0%
Institutional support sufficient	15/25 60.0%	6/17 35.3%	9/26 34.6%	12/25 48.0%
Time/workload is a barrier	14/24 58.3%	14/17 82.4%	17/26 65.4%	19/25 76.0%
Frequent adaptation of material	NC	2/17 11.8%	10/26 38.5%	13/25 52.0%
Frequent learner feedback	NC	2/17 11.8%	10/26 38.5%	6/25 24.0%

Table 3. First four rows: agree/strongly agree. Final two: often/always. NC = not comparable, because the Bulgarian questions differed. The workload denominator in Bulgaria is 24. Sources: [R2-R5].

Training at different starting points

Training demand exceeds three quarters in every sample, while perceived confidence ranges from 12.0% to 68.0%. In Türkiye, 15 of the 17 respondents agreeing on confidence also request further training. This verified overlap supports development for experienced users as well as introductory provision.

Feasibility and learner feedback

Workload is a majority concern in all four samples. Frequent feedback is reported by only 11.8-38.5% in the three comparable samples. Türkiye records a 28-point adaptation-feedback gap. Equal totals in Italy and North Macedonia do not show that the same respondents selected both answers.

The form of support differs

On the separate multiple-choice item, training leads in Italy (17/17) and North Macedonia (19/26). In Türkiye, adapted materials (17/25) and family coordination (15/25) precede training (13/25). The ordering differs from simple agreement that additional training is needed.

Learner groups and written responses

All 17 Italian respondents identify SEN, disability or accessibility needs as a barrier category. Socioeconomic disadvantage is the most selected category in the Macedonian and Turkish samples. Macedonian written answers add examples from 25/26 respondents and priorities from 26/26; this richer detail is not a measure of national need.

Key finding. Professional learning is a shared priority, accompanied by usable materials, preparation time, support and learner feedback. The survey supports locally differentiated provision; it does not assess competence or the effects of training.

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ANALYSIS BY INSTRUMENT

09

Adult interviews: implementation

Thirty semi-structured interviews add explanations and examples to the survey. The synthesis compares themes reported in national accounts. It does not count theme prevalence across a fully recoded set of 30 transcripts, and the professional composition differs by country.

Contribution	Context and findings	Analytical contribution
Bulgaria **11 interviews**	Adult evidence from the participating school concerns practical adaptation, support and interactive resources. The available forms do not reliably distinguish all professional roles.	Shows how reported needs arise within one school. Separate teacher, leadership and policymaker comparisons cannot be made reliably.
Italy **6 interviews**	An experienced urban teacher with IT responsibilities, three rural teachers and two teachers using a foreign language for curricular teaching describe different capacities for selection, adaptation and troubleshooting.	Explains variation within a country. Accounts of occasional training, informal colleague support and complex platforms identify implementation conditions.
North Macedonia **5 interviews**	A teacher-mentor, two school leaders and two institutional stakeholders discuss multi-format resources, assistive technologies, equipment preparation and accessible resource selection.	Connects classroom adaptation with school and institutional responsibility. Procurement, staff preparation and individual support address different parts of access.
Türkiye **8 interviews**	Five teachers and three school leaders describe home access, equipment renewal, technical support, workload and purposeful use. A specialist vocational setting distinguishes available boards from outdated computers.	Qualifies a general equipment narrative: needs vary by task, learner and setting. Teacher guidance and vocational relevance remain central even where equipment is present.

Table 4. Interview coverage and illustrative findings. Sources: national interview syntheses and partner clarifications [R2-R5]. The interview sample may overlap with survey respondents.

Practical knowledge and support

The interviews explain why generic digital familiarity may leave teachers uncertain about adapting resources. Italian accounts distinguish professional profiles; Macedonian accounts identify specialist preparation; Turkish accounts describe formal learning, self-learning and colleague support.

Continuity is part of implementation

Maintenance, resource ownership, subscriptions and access to help recur in adult accounts. These factors can interrupt use after a tool is introduced. Their reported importance supports examining the full preparation and support process.

Different problems require different responses

The Turkish vocational account illustrates both ageing hardware and underused existing equipment. Institutional accounts in North Macedonia add accessibility requirements at selection. These examples locate responsibility at more than one level; they do not prove the relative effect of each factor.

What this instrument can establish

Interviews identify perceived mechanisms, contextual explanations and contrasting experiences. Selection, role differences and reliance on accounts limit prevalence claims. A well-described example is not evidence that its experience is typical of every school.

Key finding. Implementation depends on the fit between the learning task, teacher preparation, learner support and the arrangements that keep resources usable. The interview evidence explains these connections without establishing causality.

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ANALYSIS BY INSTRUMENT

09

Focus groups: learners' experience

Twenty focus groups involved 150 learners: Bulgaria 42 in six groups, Italy 40 in four, North Macedonia 28 in four, and Türkiye 40 in six. The unit of analysis is the reported group discussion. The total of 150 is not a denominator for percentages of learners endorsing a theme.

Theme	What learners described	Interpretation for the study
Engagement and understanding	Bulgarian accounts value visual, interactive and game-based activities with feedback. Turkish groups value interactive, multimedia, gamified and teacher-guided learning.	Positive engagement is linked in these accounts to the way an activity is organised. Enjoyment does not establish improved attainment or equal participation.
Guidance and purpose	Italian learners explicitly request a reason for using a tool and access to teacher help. The wider learner synthesis records demonstrations, clear instructions and explanations.	The availability of assistance changes the experience of a digital task. Independent activity still needs preparation and a route to help.
School and home access	Italian accounts distinguish school support from shared household devices and the limits of smartphones for extended work. Turkish groups also describe unequal devices and connectivity.	Access needs to be checked for the actual task and location. Homework can require equipment and support that are easier to obtain at school.
Friction and balanced use	The learner synthesis includes technical problems, uneven skills, screen fatigue and platform overload. Turkish groups add family restrictions, distraction, online safety and misinformation.	More digital activity is not a sufficient indicator of inclusion. Usability, manageable demands, safety and appropriate support require attention.
Emerging uses of AI	Older students in the Turkish national account describe AI use for language learning, writing, translation and explanation.	This is reported use in particular groups. The study does not measure its prevalence, reliability or learning effect. It should remain distinct from the adult candidate accessibility example.

Table 5. Learner themes, examples and interpretation. Sources: national focus-group syntheses [R2-R5]. Statements summarise accounts; they are not verbatim quotations or frequency estimates.

What learners add to adult accounts

The discussions show how access is experienced during an activity: understanding the purpose, getting help and coping with equipment or platform demands. They complement adult judgements about provision and suggest questions that routine classroom feedback can address.

Coverage requires care

The Macedonian groups comprised learners aged 15, with one explicitly identified as facing disadvantage. Italian groups averaged ten participants. Turkish inclusion-category totals were not recorded. These differences limit subgroup comparisons and claims that all needs were represented.

Key finding. Learners describe useful digital learning as supported, understandable and feasible with the equipment available to them. Their accounts support direct consultation when materials are selected, adapted and reviewed.

ANALYSIS BY INSTRUMENT

09

Practice records: how inclusion works

The eleven records describe approaches and the conditions needed to use them. This comparison groups their proposed participation mechanisms. It assesses the logic and transfer requirements of the accounts, without assigning effect sizes or treating the records as independent impact evaluations.

Record / setting	Participation mechanism described	Requirement to examine in transfer
BG: self-paced interactive activities	Manageable steps, repetition and feedback provide time to practise.	Accessible navigation, suitable language and explanations that help learners correct errors.
BG: choice of assignment format	Alternative response formats allow learners to demonstrate a shared learning objective.	Common assessment criteria and a feasible alternative for limited equipment or connectivity.
BG: devices and connectivity	Lending arrangements address a material barrier to taking part.	Task-suitable devices, maintenance, connectivity and support beyond initial provision.
IT: Classi in Rete	Coordinated work across small rural classes broadens opportunities for peer interaction.	Joint preparation, compatible timetables, moderation and fallback activities.
IT: students as digital authors	Learners explain understanding by creating multimodal material for others.	Scaffolding, shared roles, accessible output and teacher editorial responsibility.
MK: quizzes and visual creation	Active response, feedback and supported production make participation visible.	Appropriate reading demands and alternatives to competitive speed.
MK: mainstream and assistive tools	Individual fit between the learner, task and communication, reading or sensory support.	Specialist assessment where needed, staff preparation and maintenance.
MK: guided interactive worksheets	Structured practice combines digital activity with oral explanation and reading support.	A clear objective, demonstration, preparation time and an accessible alternative.
TR: gamified digital learning	Interactive tasks and feedback are used to encourage engagement.	Check pace, navigation, task demands and whether every intended learner can contribute.
TR: digital project learning	Collaborative production connects digital activity to a purposeful task.	Explicit roles, feasible tools, teacher guidance and review of individual participation.
TR: digital language tools	Repetition and rapid feedback support additional-language practice.	Appropriate language level, usable feedback and a route to teacher assistance.

Table 6. Comparative reading of the eleven records [R2-R5]. Transfer requirements are the report's analytical interpretation. The Bulgarian records were systematised from collected evidence; Classi in Rete draws on programme documentation. Turkish interview examples beyond the three case records are not counted as additional cases.

Across the records, flexible formats, manageable pacing, guidance and material access provide complementary routes to participation. Reported benefits draw on practitioner experience and qualitative observation; the synthesis has no common outcome measure, comparison group or follow-up.

Key finding. The transferable unit is a supported learning activity with explicit access conditions. The portfolio offers practical designs for review, while improved attainment, attendance and sustained inclusion remain unverified outcomes.

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WHOLE-STUDY SYNTHESIS

09

How the evidence fits together

The instruments answer different questions: how respondents describe provision and need; how adults explain implementation; how learners experience tasks; and how practices are organised. Bringing them together supports the following analytical conclusions.

Theme	Survey signal	Interview / learner evidence	Practice contribution	Integrated finding
Functional access	Majority agreement on both sufficient equipment and significant accessibility barriers.	Accounts distinguish suitable devices, readable material, clear purpose and available help.	Device lending, accessible formats and individual assistive support address different constraints.	Review the full learning task, including its equipment, content, demands and support.
Teacher preparation	Training demand is 76.0-94.1%; perceived confidence varies substantially.	Adult profiles differ in adaptation and troubleshooting. Learners request explanation and demonstration.	Guidance accompanies worksheets, interactive practice and supported production.	Professional learning should connect practical adaptation with classroom use and review.
Feasibility and continuity	Workload is a majority concern; sufficient support attracts 34.6-60.0% agreement.	Adults describe maintenance and support gaps; learners describe technical friction.	Network coordination, preparation and specialist support are explicit requirements.	Resource development needs time, ownership and support arrangements alongside teaching guidance.
Learner feedback	Frequent feedback is reported by 11.8-38.5% in comparable samples.	Focus groups identify difficulties with instructions, purpose, equipment and help.	Cases illustrate possible responses, without a common measure of learner consultation.	A systematic feedback route is a development priority whose feasibility and effect need testing.
Local variation	Language, learner-group and support priorities differ between samples.	Professional profiles, school settings, home access and individual support requirements differ.	Rural networks, device lending, specialist support and language practice address distinct needs.	Use a common review framework with local selection and adaptation of resources.

Table 7. Integration of the evidence streams [R2-R5]. Each row is an interpretive synthesis, not a statistical model. Agreement across streams does not imply that each stream is independent: participants and source material may overlap.

Where the evidence is most consistent

Professional development, practical access and the need for support recur across numerical findings and contextual accounts. This consistency strengthens their relevance as development priorities within the study. It does not establish their prevalence in the four national education systems.

Where the evidence remains provisional

The cases describe plausible ways to respond, but the study does not compare their effectiveness. Claims about learning gains, retention, cost savings, the relative value of tools or benefits for specific inclusion categories require further evidence.

Key finding. Inclusive digital teaching emerges here as a connected set of conditions: accessible resources, purposeful activities, prepared educators, feasible support and learner input. The study provides a basis for developing and testing that combination.

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WHOLE-STUDY SYNTHESIS

09

Patterns, differences and priorities

The patterns below describe the evidence collected in this research. There is no repeated measurement over time, so they should not be read as trends in national progress, growth in digital use or changes in teacher competence.

1. Use is established; inclusion varies

Regular digital use is reported by around two thirds or more in each sample. The wider variation in inclusive planning and adaptation confidence suggests that frequency of use is an incomplete description of readiness. The qualitative accounts add the task-level conditions that frequency measures leave out.

2. Confidence and training demand coexist

The Turkish response-level overlap shows that confidence does not remove demand for development. The Bulgarian sample combines comparatively high agreement on institutional support with low agreement on adaptation confidence. These contrasts support different entry points to training and separate examination of organisational and practical needs.

3. Adaptation needs a feedback process

The Turkish adaptation-feedback difference is a specific finding. Italy and North Macedonia show no aggregate gap on these two items, although frequent feedback is still reported by a minority. Across the study, learner discussions demonstrate the kind of information that feedback could contribute; they do not prove that a particular routine improves results.

4. Priorities reflect participating settings

Bulgaria brings a strong language-barrier signal; Italy emphasises SEN, disability and accessibility. Macedonian responses combine substantial training demand with divided views on institutional support. Türkiye gives particular weight to adapted materials and family coordination. Sample composition and context remain possible explanations.

5. Enthusiasm requires usable conditions

Learners value interactive and visual activities while describing technical problems, unclear purpose and uneven home access. Turkish accounts add safety and misinformation concerns. The synthesis therefore supports purposeful, supported use with suitable alternatives; positive engagement alone cannot demonstrate inclusion.

6. Promising practice needs outcome evidence

Across the portfolio, flexibility, guidance and access support provide plausible routes to participation. The available evidence describes implementation and perceived benefit. It does not show which approach works best, for whom, at what cost, or whether benefits persist. These are questions for subsequent classroom review.

Implications for the research as a whole

The study supports three connected priorities: develop teachers' practical adaptation skills; make usable resources and implementation support available; and include learner feedback in review. Local choices should respond to the documented barrier and learning task. The conclusions on the next page answer the five research questions; the recommendations translate them into actions.

Interpretation is bounded by purposive recruitment, different role and learner profiles, non-comparable items, possible overlap between sources and the absence of common outcome or longitudinal measures. Sources: [R1-R5].

Key finding. The contribution of this research is a comparative account of needs, implementation conditions and promising responses. It supports context-sensitive development and classroom testing, with national rankings and causal claims outside its scope.

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CONCLUSIONS

10

What we conclude

The evidence provides a coherent basis for developing inclusive digital teaching resources while preserving differences between countries that are real and worth keeping. The conclusions below answer the questions the research set out to ask, and state the limits within which they should be used.

The question	What we conclude	Evidence and limits
Use of digital tools	Regular use can support learning, alongside attention to participation barriers.	Agreement on regular use ranges from 64.7% to 73.1%. Qualitative accounts describe useful activities and access constraints.
What access requires	Functional access combines equipment, accessible content, understandable tasks and available support.	Agreement on equipment access varies by 6.5 percentage points; inclusive planning by 36.0 points. These are separate survey statements.
What teachers need	Professional development is a shared priority, with starting points that differ between settings.	Training demand ranges from 76.0% to 94.1%; perceived confidence from 12.0% to 68.0%. Confidence was not assessed independently.
Transfer of practice	Adaptation, guided participation and flexible response options merit local examination.	Eleven practice records describe these approaches and their conditions. They do not establish independently measured causal effects.
What should change	Connect professional learning, accessible resources, maintenance and learner feedback.	The recommendation draws on the four evidence streams. Feasibility and effects require review in the intended settings.

The strength of comparing four countries

The central themes recur across different kinds of evidence, but not with equal intensity everywhere. Türkiye's confidence results, the concentration of the Bulgarian survey in one school, and the narrow age profile of one learner group all prevent an undifferentiated account.

Preserving those differences makes the recommendations more usable, not less. They specify what to examine and what to support, rather than prescribing a single technology or a single training level for four unlike school systems.

What this research does not establish

It does not measure how common any of these conditions are nationally, it does not assess teacher competence, and it does not demonstrate that any practice described here causes an improvement in attainment, attendance or retention.

The evidence can inform priorities for development and questions for piloting. Decisions about wider adoption require further examination of feasibility, access and learning in the intended settings.

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RECOMMENDATIONS 11

For classrooms and schools

These are proposals for practice, not requirements. Each one follows from a finding in this report, names the level that can act on it, and suggests what evidence would show whether it made a difference.

Recommendation	What it means in practice	Evidence for review
Check access for the intended task.	Check devices, connection, formats, navigation and routes to help. Review when the activity or learner requirements change.	A brief record of barriers identified and adaptations made.
Prepare equivalent routes.	Provide readable instructions and suitable response options alongside the main activity.	The task, alternative route, learning criterion and learner feedback.
Connect training to preparation.	Allow a manageable preparation slot; teachers adapt an activity and review it after use.	A reusable example, preparation time and a short reflection.
Gather learner feedback routinely.	Use brief accessible questions after an activity, with different ways to answer. Make changes in response.	An anonymised account of feedback and any resulting change.
Limit unnecessary platform changes.	Maintain a manageable core set. Introduce a new tool with preparation and follow-up support.	What remains in active use, what was retired and why.
Guide emerging-tool use.	Show how to check outputs and handle personal data. Retain human responsibility for assessment and access.	A reviewed example showing how verification informed use or correction.

Keeping it proportionate

Every recommendation above was written against the workload finding. Begin with one task and reuse what is learned from it. A short record of the barrier, the adaptation and the learner response is feasible in a working week; a new reporting form for every lesson is not, and would be abandoned within a term.

Shared resources should carry the conditions under which the task worked — the devices assumed, the reading level, the preparation time — so that the next teacher can adapt it rather than repeat the same preparation from scratch. That single habit is what converts individual effort into something a school keeps.

Recommendations need to remain feasible within normal teaching workloads.

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RECOMMENDATIONS

11

For institutions and policy

Priority	Suggested responsibility and action	The question to ask afterwards
Differentiated professional development	School leaders and teacher-development providers begin with a short assessment of practical need, then offer a foundation strand and an advanced strand rather than one course for everyone.	Did the activity meet the teacher's actual adaptation need, or the one that was assumed?
Continuity and technical support	School leadership and responsible bodies assign maintenance and resource ownership, name a contact for help, and plan for continued access after any external support ends.	Can the school keep the practice usable in two years without the people who introduced it?
Accessibility as a condition of acquisition	Education authorities and institutions require accessibility by design in the digital materials, platforms and hardware they purchase, and make task usability part of how resources are reviewed and chosen.	Can the intended learners use this resource with the support that is actually available?
Coordination with families and specialist services	Schools agree a workable route for home use and involve specialists where individual access needs require it — without transferring responsibility for accessibility to families.	Did the arrangement reduce a barrier that had been documented, or only redistribute it?
Evidence-informed consultation	Findings, national differences, limits and practical examples are presented to educators and policymakers for review rather than published as settled conclusions.	Which recommendations are feasible here, what resources would they need, and what should change before wider use?

The European policy context

These findings sit comfortably alongside the European Digital Education Action Plan's emphasis on inclusive and accessible digital education, and they connect with the European framework for the digital competence of educators in the areas concerned with digital resources, teaching and learning, assessment and empowering learners.

These frameworks provide a reference for professional development and resource design. They were not measurement instruments in this study and do not validate its samples or establish teacher competence.

A closing word on procurement

Considering accessibility when acquiring resources can reduce avoidable adaptation work for teachers and improve the starting conditions for classroom use.

Teachers and specialists will still need to adapt learning activities for individual needs. Responsibility for accessible provision should also extend to those selecting and supplying the resources.

Frameworks: Digital Education Action Plan and DigCompEdu [R6-R7]. Technical checks for web resources can draw on WCAG 2.2 [R9].

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FROM RESEARCH TO THE CLASSROOM 12

Turning evidence into classroom practice

This chapter translates the findings into priorities for developing accessible teaching resources and proposes how their use can be examined in classroom piloting.

Selecting and adapting existing resources

Captions, transcripts, text-to-speech, adjustable typography, accessible documents and interactive exercises are already available through many existing tools. Their suitability still depends on the intended task, learners and setting.

The partnership's work is to select resources, check access, adapt material for learner needs and national contexts, and integrate it into a classroom activity that can be used in ordinary teaching practice.

Selection, adaptation, teaching guidance and piloting form a connected process. This does not require the production of new applications.

Existing software can offer maintenance and support, but continuity is not guaranteed. Selection should consider cost, account requirements, future access, responsibility for updates and alternatives if a service changes.

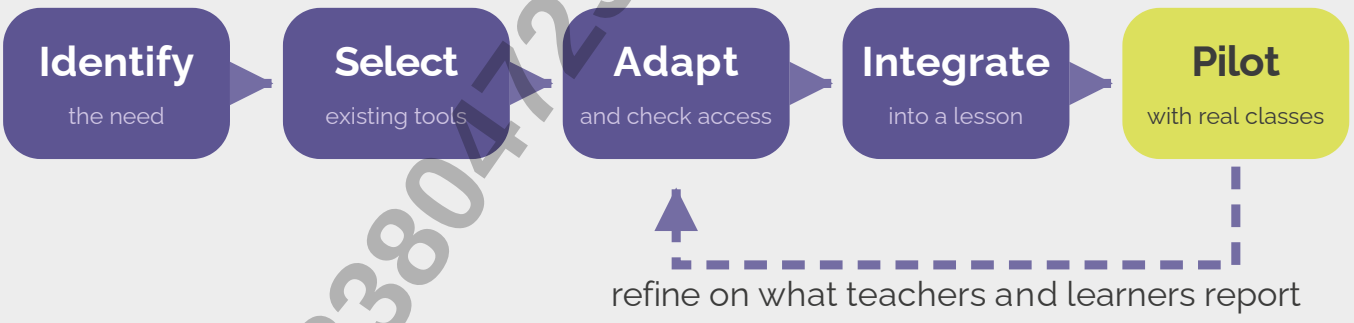


Figure 6 From research to classroom use. The proposed development cycle includes review and revision.

The proposed resource package

A structured resource organised by inclusion need, with suitable tools, accessibility guidance, adaptations, a worked classroom activity and concise teacher instructions. Classroom piloting should inform revision before open publication.

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FROM RESEARCH TO THE CLASSROOM 12

Eight needs, and what answers them

The research points to eight recurring inclusion needs. The table links each need with relevant resource categories and a question for checking suitability. These are proposed development priorities, to be reviewed through use.

Inclusion need	Resource categories	Question for review	Evidence source
Content cannot be perceived	Captions, transcripts, audio description and accessible documents.	Can intended learners access the information in a suitable format?	Accessibility needs in adult accounts across the four contributions.
Reading or comprehension load	Text-to-speech, readable typography, simplified parallel text and structured worksheets.	Can the learner understand the instructions and adjust presentation?	Adaptation examples in national practice records.
Language of instruction	Glossaries, translation support and visual or audio vocabulary support.	Is subject meaning clear and preserved?	Language barriers were reported most frequently in Bulgaria.
Limited devices or connectivity	Offline and low-bandwidth formats, printable equivalents and device-light tasks.	Can the activity be completed with the access actually available?	Learner and adult accounts, including home access.
One route for showing understanding	Audio, video or written responses and structured collaborative production.	Is the learning criterion consistent across response formats?	Practices in Bulgaria and Italy.
Unsuitable pace or limited practice	Self-paced exercises, explanatory feedback and revisitable material.	Can learners repeat the task and obtain help when needed?	Practices in Bulgaria and North Macedonia; learner accounts.
Individual assistive requirements	Specialist support selected around the learner and combined with mainstream resources.	Does selection reflect individual assessment and available support?	Macedonian resource-centre practice; Italian survey priorities.
Irregular learner feedback	Brief accessible feedback with different response modes.	Can learners contribute, and does their feedback inform revision?	Frequent feedback: Italy 2/17; North Macedonia 10/26; Türkiye 6/25.

Figure 7 Eight inclusion needs and the tools that answer them.

The tool categories describe kinds of resource rather than named products. Where participants named specific platforms in describing their own practice, those names appear in the practice chapter; they are not recommendations, and any tool selected will have to pass the accessibility check in the third column before it enters the teaching resource.

Keeping development manageable

Focused packages can connect each priority with checked resources and a worked classroom activity. Piloting should establish the support and preparation time required. Further examples can be added as teachers document use and adaptation.

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FROM RESEARCH TO THE CLASSROOM 12

How we will know whether it works

Principles for development

Begin with a learning task. Identify the objective, the participation barrier and the support needed before selecting a resource.

Provide two entry levels. Offer introductory guidance and more advanced adaptation tasks, reflecting the different confidence and training patterns.

Prepare equivalent routes. Include suitable formats and response options, with a common assessment purpose.

Check feasibility. Record preparation time, teaching time and the assistance required in the actual setting.

Build in accessibility. Review the resource before use and retain responsibility for addressing access problems.

What a classroom trial should record

State the learning objective, intended learners, setting and participation barrier. Describe the activity, alternative routes and support provided. Invite accessible feedback from learners and teachers, including those unable to complete the task.

Where counts are reported, state the number observed and the relevant denominator, when and how the observation was made, and any missing information. A small pilot can guide revision without establishing a causal effect.

Questions for review

Can learners obtain, perceive, understand, navigate and respond to the material? Can the teacher prepare and use it within the available time? Does it address the intended needs and fit the learning objective?

Review these questions before, during and after use. Record changes to the material and what prompted them. Describe participation prospectively and protect learners' privacy in the records.

The practical value of this research will depend on whether the resulting resources improve participation in real classroom activities.

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ANNEX A

The survey in one table

Selected comparative survey items. Cells show the number agreeing out of valid responses. The final two rows report frequency. Multiple-choice support needs and learner-group responses appear in their thematic chapters.

Survey statement	Bulgaria	Italy	North Macedonia	Türkiye
Digital tools are used regularly for teaching and learning	17/25 68.0%	11/17 64.7%	19/26 73.1%	18/25 72.0%
Teachers have sufficient access to basic equipment and platforms	17/25 68.0%	11/17 64.7%	16/26 61.5%	17/25 68.0%
Digital tools are used in ways that support different learner groups	13/25 52.0%	10/17 58.8%	17/26 65.4%	18/25 72.0%
Learners facing disadvantage are sufficiently considered in planning	9/25 36.0%	10/17 58.8%	12/26 46.2%	18/25 72.0%
Accessibility barriers are a significant issue	14/25 56.0%	12/17 70.6%	14/26 53.8%	18/25 72.0%
Language barriers affect the use of digital resources	17/25 68.0%	7/17 41.2%	10/26 38.5%	9/25 36.0%
Teachers feel confident adapting digital tools for inclusive teaching	3/25 12.0%	3/17 17.6%	10/26 38.5%	17/25 68.0%
Additional training on inclusive digital teaching is needed	23/25 92.0%	16/17 94.1%	20/26 76.9%	19/25 76.0%
Leadership or institutional support is sufficient	15/25 60.0%	6/17 35.3%	9/26 34.6%	12/25 48.0%
Time and workload make inclusive implementation more difficult	14/24 58.3%	14/17 82.4%	17/26 65.4%	19/25 76.0%
Materials are adapted for different learner needs — often or always	—	2/17 11.8%	10/26 38.5%	13/25 52.0%
Learners are asked for feedback on barriers — often or always	—	2/17 11.8%	10/26 38.5%	6/25 24.0%

A dash means the question was asked differently in that country and the answers are not comparable; it does not mean zero. One Bulgarian respondent did not answer the workload question, so that denominator is 24.

Reading the figures

Higher agreement on accessibility barriers, language barriers and workload indicates a problem. Training need indicates demand for development. The rows cannot be added into a score. One response changes a percentage by 4.0 points in a sample of 25 and 5.9 points in a sample of 17.

Sources of the counts

Bulgarian and Macedonian counts were checked against response exports, and Turkish counts against the coded workbook. Italian figures use the corrected national aggregate. The final Bulgarian items were not comparable. Sources and limitations are described in the methodology and references.

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REFERENCES

Evidence sources and frameworks

Project evidence

[R1] DigiBridge partnership (2026). Common research methodology, version 1.2; research instruments and approved project application. Internal project documentation.

[R2] Bulgarian national research team (2026). Revised national contribution; questionnaire response export (25 responses); partner clarification of 11 September 2026.

[R3] Italian national research team / CRHACK LAB FOLIGNO 4D ODV (2026). Revised national report, version 2, 15 September 2026; corrected survey aggregate (17 responses) and partner clarifications.

[R4] Macedonian national research team / European Citizenship - Action (2026). National contribution and questionnaire response export (26 responses), supplied in September 2026.

[R5] Turkish national research team / ILMEM (2026). National report; coded survey workbook (25 responses); implementation and ethics log; case records and partner correspondence, including 15 September 2026.

Source material and clarifications available through 15 September 2026 informed this synthesis. These are project records, not independent peer-reviewed publications. Underlying material remains subject to participant confidentiality and partner arrangements.

Wider frameworks

[R6] European Commission. Digital Education Action Plan 2021-2027. European Education Area.

https://education.ec.europa.eu/focus-topics/digital-education/actions/plan

[R7] European Commission, Joint Research Centre. European Framework for the Digital Competence of Educators (DigCompEdu).

https://joint-research-centre.ec.europa.eu/scientific-activities/key-competences-lifelong-learning/digcompedu/digcompedu-framework_en

[R8] CAST. Universal Design for Learning Guidelines, version 3.0.

https://udlguidelines.cast.org/

[R9] World Wide Web Consortium. Web Content Accessibility Guidelines (WCAG) 2.2.

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THE PARTNERSHIP

Who carried out this research

DigiBridge - Digital tools for inclusive teaching is an Erasmus+ Cooperation Partnership in School Education (2025-1-BG01-KA220-SCH-000363350). This report presents the international synthesis of its research phase (WP2), informing the development and classroom testing of accessible teaching resources.

BULGARIA · COORDINATOR

Centre for Educational Integration of Children and Students from Ethnic Minorities

A national body working on the educational integration of children from ethnic minorities and on equal access to quality education. Coordinates the partnership and leads on quality assurance and on the translation and publication of the teaching resources.

ITALY

CRHACK LAB FOLIGNO 4D ODV

A digital innovation and civic technology organisation working on digital literacy, accessibility and open knowledge. Led the stakeholder fieldwork for this research and leads the development of the teaching resources that follow from it.

NORTH MACEDONIA

European Citizenship – Action (ECA), Bitola

A civil-society organisation working at the intersection of civic participation, European integration and public policy in education. Designed the research methodology, led the national research and prepared this international synthesis.

TÜRKIYE

Istanbul Provincial Directorate of National Education (ILMEM)

The regional education authority for Istanbul, responsible for schools across one of Europe's largest metropolitan education systems. Publishes this report and leads the school-based testing of the resources developed from it.

With thanks

The partnership thanks the 93 survey respondents, 30 adult interview participants and 150 learners, as well as the schools and national teams that supported this work. The survey and interview totals may include some of the same people; they are not a count of unique adults.

We also thank colleagues who documented practices and described their context, support requirements and limitations. These contributions provide the basis for the international comparison.

Using the research

The next phase connects the findings with resource selection, adaptation, teacher guidance and piloting. The proposed checks in Chapter 12 support review of accessibility, feasibility and participation in classroom use.

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We welcome accounts of how the findings are used and feedback on where they may not transfer to another context.

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Inclusive digital teaching requires accessible materials, suitable tasks and support for learners.

DigiBridge brings together evidence from teachers, school leaders, institutional stakeholders and 150 students in Bulgaria, Italy, North Macedonia and Türkiye. This report presents their experiences, national differences and priorities for practical development.

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DigiBridge

Digital tools for inclusive teaching

Co-funded by the European Union

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