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QUALITATIVE AND QUANTITATIVE DIMENSION OF EVALUATION

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Preface

As outlined in the ATS2020 research proposal, this is the policy recommendations document (Deliverable 5.4).

Responsibilities for the development of WP5 (Evaluation) is shared by both leading partners (ERI and CERE) . Here we are presenting policy recommendations based on qualitative and quantitative evaluation.

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ATS2020 qualitative evaluation

Summary of the results

This section draws from results reported in Deliverable 5.3B.

To begin with, in all country reports, the model appeared to work well in case studies. Partners discussed aspects and factors that were more and less successful (Table 1). The different contexts and educational systems led to modifications in the implementation of the ATS2020 model. *ePortfolio* was, for example, one of the main aspects modified. In some countries it was understood and discussed as a product/showcase (e.g. **CY),** while in other countries it became a part of students' assessment and self-evaluation (e.g. **LT**) and a way to observe students' progress and learning (e.g. **IE**). Modifications were involved to accommodate and facilitate the implication of the ATS2020 model and connect it to the school and class context, based on teachers' skills and understanding. The modifications seemed to be influenced by factors, such as the presence of the concept of transversal skills in the educational system and curriculum, and teachers' understanding of the skills, as well as approaches in teaching and learning. Hence, allowing flexibility for adjustments would allow for implementation of the ATS2020 model, in line with each country's context and system.

Table 1: Participants' satisfaction and difficulties on the critical aspects of the model

	Satisfaction	Difficulties
Transversal Skills	• Information Literacy (e.g. **CY**, **HR**, **EE**, **SI**) • Collaboration/Communication (e.g. **CY**, **HR**, **EE**, **SI**, **GR**, **IE**) • Autonomous Learning (e.g. **IE**, **BE**, **SI**) • Creativity/Innovation (e.g. **BE**)	• Information Literacy (e.g. **ES**, **GR**, **EE**) • Collaboration/Communication (e.g. **ES**, **GR**, **EE**) • Autonomous Learning (e.g. **HR**)
ePortfolio	• Satisfied with the outcome (e.g. **LT**)	• Time consuming (e.g. **CY**, **ES**, **GR**, **IE**) • Confusing and difficult fields (e.g. **CY**, **ES**, **GR**, **IE**, **LT**, **HR**) • Questioning *ePortfolio* (e.g. **EE**)
MyLearning Journal	• Satisfaction (e.g. **LT**) • Useful for students' self-assessment and self-reflection (e.g. **CY**) • Student-centred approach (e.g. **IE**)	• Time consuming (e.g. **CY**, **GR**, **LT**, **HR**) • Understand the fields setting goals and strategies (e.g. **CY**, **LT**, **IE**, **HR**)
Assessment	• Satisfaction (e.g. **ES**, **GR**)	• Unfamiliar participants (e.g. **ES**, **HR**, **EE**) • Self-assessment and its wording (e.g. **CY**, **LT**) • Monotonous procedure (e.g. **BE**)

Innovative learning approaches using online environments and digital tools	• Great satisfaction from all countries • Mahara (e.g. **ES**) • Virtual environments (e.g. **GR**) • Students' satisfaction (e.g. **CY**, **HR**, **EE**) • Opportunities offered (e.g. **IE**)	• Technical issues (e.g. **CY**, **HR**, **EE**) • Schools' infrastructure (e.g. **CY**, **HR**, **EE**) • Teachers familiarity with technology (e.g. **HR**) • Difficulties with platforms (e.g. **ES**, **GR**, **EE**, **LT**, **HR**)

On the basis of the qualitative report, it can be argued that students' transversal skills were developed through this project. Participants overall acknowledged that the implementation allowed them to address transversal skills in their teaching. Yet, transversal skills were not emphasized at the same level by all countries. Participants' satisfaction levels varied in regard to the development of each transversal skill of the ATS2020 model: Information Literacy [**CY, HR, EE, SI**], Collaboration/Communication [**CY, HR, EE, SI, GR, IE**], Autonomous Learning [**IE, BE, SI**] and Creativity/Innovation [**BE**]. In addition, positive attitudes towards the model and its implementation were reported by most countries (**CY, GR, IE, BE, FI, HR, EE**).

In regard to the critical aspects of the ATS2020, participants seemed to be overall satisfied, despite the difficulties or obstacles. The involvement of *transversal skills* in teaching and learning was a positive aspect of the implementation for the implementation. The level of skills' development varied, which applied for the selection of targeted skills in each country. Despite modifications and difficulties faced, the next critical aspect, *ePortfolio*, was implemented quite successfully. The difficulties discussed in detail on a country by country basis mainly related to the *ePortfolio* being time consuming and having confusing and difficult fields. A similar picture emerged for the MyLearning Journal aspect. In regards to the assessment, some countries were satisfied, even though instances were reported that participants were unfamiliar with assessment and self-assessment and the wording used. Finally, technology, was an aspect that satisfied all participants, as discussed earlier. Difficulties and problems occurred but the participants were still satisfied with technology's involvement in teaching and learning.

On the basis of these findings, policy recommendations are presented next.

Policy recommendations

• *Approaching transversal skills*

A place for transversal skills in school curricula

To begin with, it seems important for transversal skills to be addressed in the national curricula. The development of these skills could adopt a hierarchical structure. For instance, CY suggested that Autonomous Learning should go last in priority in the targeted skills of a lesson as other transversal skills should be developed before.

Teaching approaches

With regards to the lessons, teachers could design the LCs, focusing on the development of a specific transversal skill and not all of them (**CY**). Teachers could allow time for students to understand and set prior knowledge, goals and strategies, which should be changing and considered when developing the lessons (**CY**). Regarding group work, it was suggested that this be emphasized, and attention is given to observe how each group works, how it works well and that group members are changing roles on a regular basis (**FI**). Finally, instructions and assessment should be clearly stated and explained (**FI**). In regard to students, they should be encouraged to discuss with the teachers what is not clear or what requires more time or explaining (**CY**), while their role in the lesson should be active (**GR**). Teachers should constantly monitor the process and allow time to reflect on the teaching practice and student learning. In this respect, teachers could make the necessary modifications according to the needs of the classroom.

- *Addressing teachers*

Digital skills

Teachers' digital skills and familiarity with ICT were seen as either a supportive factor or an impediment; while teachers' expertise in ICT skills was identified as a supportive factor, limited digital skills were related to implementation challenges (e.g. **CY, HR).** Also, teachers who were familiar with ICT and had digital skills could be able to cope and resolve such incidents and proceed with their lessons. Hence, the need was identified for training and support to teachers (**CY, ES, IE, FI, EE**).

A more successful implementation would require participants to have digital skills, so that progress is not restricted (**ES**) and participants can adapt to change suggested by or involved in the model (**GR, HR**). It was also recommended that more support be provided to the participants to facilitate the implementation (**IE**). Teacher training prior to any implementation is a crucial factor for future implementation of the ATS2020 learning model or of similar models targeting transversal skills (Yoko, 2015). ATS2020 consists of a range of basic elements (*My Learning Journal, ePortfolio, formative assessment, transversal skills, online learning environments*) which require time, elaboration and intensive engagement on part of the teachers in order for them to be able to incorporate them in their teaching. Therefore, ongoing, better and more seminars should be offered to the participants (**CY, GR, HR**), often with a practical perspective (**HR**). It could be suggested that more dedicated trainings to different aspects of the learning model should be offered prior to implementation. Digital skills and digital pedagogy should be prioritized. A combination of practical hands on experience as well as of theoretical knowledge should be sought for each one of the basic elements of the model in the framework of the training program. Material and resources should be available (**IE**) along with sharing successful examples (**LT**) and sample ePortfolios (**IE**).

Teacher motivation/accountability

A set of measures could be taken to facilitate implementation of the ATS2020 learning model and provide additional incentives to teachers to design and implement their lessons according to the model (Yoko, 2015: 20). The adoption of *new innovative assessment approaches* could also include *ePortfolio* as part of standardized assessment could be a useful tool. These measures could increase accountability which seems to be much needed with reference to the integration of transversal skills in Education

(Yoko, 2017: 18) Certain initiatives could also engage teachers more systematically in experiential professional learning, and pilot activities with a view to enable a shift in the teaching practice.

- *Providing support*

Time

Based on the findings of the case study reports by the partners it was recommended that time be allowed for the implementation to be prepared (**LT, FI**) so that participants become familiar with the terms and resources included (**CY**). Perhaps certain transversal skills should be targeted for longer period, in order for change to take place. Likewise, teachers could allow more time for the *My Learning Journal* or for familiarization of the students with the online learning environments.

Technical infrastructure

Another recommendation related to involving more technological and interactive tools (**ES, LT, BE**). Interestingly, online environments and digital tools were identified as one of the key strengths and matters participants were satisfied with. Technical issues and difficulties are often anticipated when technology is involved. A good infrastructure would, therefore, be considered important for successful implementation, since technical issues and difficulties with ICT were identified to a great extent and detail (lost or forgotten passwords, lack of equipment, slow internet connection). Classes should be equipped with the necessary infrastructure (one computer per student) in order to implement the model. Unobstructed access to computers is a prerequisite in order for schools to mitigate any issues connected with time limitations etc. Additionally, it should be ensured that a strong internet network is in place at all times in order for students to work in the online space, and be able to perform their work without interruptions.

School leadership

School administration should take initiatives to create a supportive culture in the school, one that would place 21st century skills and innovative learning approaches at the fore. In this respect schools could promote the introduction of more non-teaching time to teachers as well as a collaborative teaching approach in the schools. Schools should celebrate initiatives of innovative learning so as to encourage more active involvement of teachers.

References

Yoko, S. (2015). 2013 Asia-Pacific Education Research Institutes Network (ERI-Net) Regional Study on Transversal Competencies in Education Policy & Practice (Phase I). *Regional Synthesis Report.* UNESCO Bangkok.

ATS2020 quantitative evaluation

Summary of the results

This section draws from the results reported in Deliverable 5.3A.

The implementation of the quantitative evaluation required sampling of schools and students and their teachers within these schools as respondents of the study's instruments. Within the partnership it was decided that the experimentation will include students from upper-primary and lower secondary schools in participating countries. The participating schools were chosen through a convenience sample. Different instruments were developed (student –pre and –post test, questionnaires for teachers and students), all of them were electronically delivered.

In regard to the main research question of the ATS2020, *"To what extent did the ATS2020 learning model promote the development and the assessment of the transversal skills defined for the purposes of the project?"* the quantitative evaluation analysis showed significant differences between control and experimental classes in post-test, in almost half of the countries (Belgium, Croatia, Lithuania and Finland). These results, however, must be interpreted while accounting for the countries' educational context. For example, some countries, like Ireland, Finland and Spain, already have policies towards development of transversal skills at school. In addition, practices towards transversal skill in teaching and learning taking place at school and even class level have to be accounted for as well.

Interestingly, in most countries (Croatia, Estonia, Finland, Ireland, Lithuania and Spain) girls outperform boys in regard to the transversal skills. This appears in the results from both the pre- and post-test. This is inline with the results from other studies on related constructs like the International Computer and Information Literacy Study (ICILS) 2013 where girls performed better on the test (Fraillon, Ainley, Schulz, Friedman, & Gebhardt, 2014). The results show, however, that in some cases the differences between boys and girls decreased from the pre- to post-test. That is, the intervention mitigated the gaps to some extent.

In most cases the older students outperformed younger ones and the differences increase gradually with the actual student age. That is, the development of the transversal skills is related to age or to the number of years of schooling. Additional research on this association is needed.

Important part of the ATS2020 quantitative evaluation is the context of learning, especially in regard to transversal skills and the relationship of the contextual factors with the performance on the test, as well as the student and teacher attitudes. In some cases, the attitudes towards transversal skills became more positive (i.e. more valued) both in teachers' and students' opinion. In more than half of the countries, a positive association between students' attitudes towards transversal skills (i.e. their importance) – Croatia, Cyprus, Greece, Ireland, Slovenia and Spain. That is, the more the students find transversal skills important, the higher they tend to achieve. This is also true for teachers' attitudes towards transversal skills – in most countries, the higher importance teachers give to transversal skills, the higher the performance of their students tends to be.

For many of the skills in many countries students responded that they acquired them by themselves and not through the educational systems' efforts.

Policy recommendations

The quantitative evaluation of the ATS2020 learning and assessment model involved students, teachers (schools) in 10 piloting countries. This section provides a summary of the policy recommendations stemming from the ATS2020 quantitative evaluation findings.

In response to the research question *"To what extent did the ATS2020 learning model promote the development and the assessment of the transversal skills defined for the purposes of the project?"* the quantitative evaluation analysis showed significant differences between control and experimental classes in post-test in almost half of the countries (Belgium, Croatia, Lithuania and Finland). On the other hand, however, the qualitative evaluation analysis of results showed that most partners have the opinion that students' transversal skills were developed to a great extent. Having in mind those results we can make several policy recommendations, like:

1. Implementing and developing transversal skills and technology-enhanced learning design are complex processes for both teachers and students that require time to be adopted;
2. Both teachers and students need longer engagement in activities promoting transversal skills and **assessing student prior and achieved learning, needs to have longer period in between**;
3. In most cases (Croatia, Estonia, Finland, Ireland, Lithuania and Slovenia) girls outperformed boys, both before and after the intervention. This result is in alignment with the findings for the majority of countries participating in different international large-scale student assessments covering different literacies (computer and information literacy, reading literacy, civic and citizenship literacy, mathematics and science literacy), like IEA' ICILS 2013 study, different cycles of PIRLS and ePIRLS 2016, ICCS and OECD PISA study as well (see international reports accessible from studies websites or common website http://ilsa-gateway.org/studies). This shows that **education systems need to introduce approaches to ensure that boys have the same potential and opportunity to develop transversal and other skills, as girls**. In addition, the results pointed that **teaching and assessment of transversal skills should use proper balance between textual and visual items. However this hypothesis should be further tested,** as this project did not aim to do so, and tested in other project yet. Thus, there is a need for a project with this particular focus.
4. In most cases the older students outperformed the younger ones, leading to the indication that **development and assessment of transversal skills approaches and tools, should take into consideration the age**.
5. In most cases (Croatia, Cyprus, Ireland, Slovenia, Spain and Greece) there was a positive association between students' attitudes towards (the importance of) transversal skills and student performance for most of sub-domains. This was found in Belgium, Estonia, Finland and Lithuania. This correlation compels us to stress that **practices supporting students' positive attitudes and interest, towards the development of transversal skills, as well as creating motivation towards their deployment in various aspects in their lives are needed**.
6. In most countries, students whose teachers give higher importance to transversal skills have higher performance. Furthermore, the qualitative evaluation analysis showed that **teachers'**

expertise in Information and Communication (ICT) skills proved to be a significant factor in determining the effectiveness of the ATS2020 learning model in class. Therefore, we stress the **need to adopt and enrich further policies on teachers' professional learning and development in the area of ICT competence, as well as the importance of transversal skills and their development**.

7. From the experiment results we can infer that **teachers and school matters, but are not the only players in acquiring transversal skills by students** – students reported that the great part of the transversal skills is acquired by themselves, from peers, etc. Given the level of critical thinking for 8th graders in Europe facilitated by the digital technologies (see especially the ICILS 2013 results) **teaching practices should be adjusted** for it. Teachers, however, should be trained in foreseeing and guiding future development of transversal skills.

8. The ATS project results also showed **that some of the everyday myths are questionable. For example, that younger teachers are better with new technologies and that men are better in using new technologies – those myths are not supported by the data gathered**. From the quantitative data we see that teachers' age is highly correlated with teaching experience which is related to students' transversal skills. Therefore, teacher exposure to adequate INT and CPD in teaching transversal skills is essential. Computer literacy is one of the components in using technologies. Information literacy (what you do with the information) is the key to solving a problem. We did not find any clear evidence that teachers' age or gender will be essential for students acquiring transversal skills.

Other recommendation that arise from the quantitative evaluation processes, results and their interpretations are as follow:

1. From the very beginning of the quantitative evaluation, experts on test items development and experts on specialized areas (for example creativity and innovation) shall be involved. Also, all project partners should be involved in the test and item design and the item writing process. Deploying a digital environment that can host different test items design from the early beginning of the project is essential.

2. A pre-piloting of the items and the entire test in real classroom situations in all countries is necessary to validate the test items and to exercise the testing procedures, as the context in a multinational experimentation varies a lot.

3. For such policy experimentation projects, the time needed should extended, so as to cover two consecutive school years, as the experimentation is closely related to the school year schedule. Thus, **a five-year time span is needed** to allow the experimentation project to define the intervention, design the research methodology, develop the tools and procedures, adapt them to the participating countries national language and context, implement a pre-pilot, refine the tools and procedures, implement the actual experimentation for a whole school year, collect and analyse data, and report the findings.

4. If the partners want to compare results between the countries (not only within the country) the design of the evaluation, as well as the intervention in all of the countries, should follow the same approach. In addition, **proper sampling should be employed too to ensure that the samples represent the population of the target group of students in the country and to allow for cross-country comparisons**. Also, **different timing and different tests for different populations has to borne in mind**.

5. From the countries' interpretation of their results the conclusion that **transversal skills need to be approached not only subject matter but cross-curricular, i.e. that whole school approach is needed, arose**.

6. We found out that **teacher attitudes towards and opinions on the importance of transversal skills on different levels (education system, school and teaching practice) vary.** Therefore, more attention should be paid to teacher training and CPD to encourage them to collaborate more with each other and ensure they feel comfortable implementing projects in digital environment. Further attention should be paid to the sources of transversal skills developmental support (e.g. multidisciplinary, cross-curricular teaching).

7. **Developing transversal skills should be a whole school approach, encouraged by the national curricula.** It has to be borne in mind that **involvement of transversal skills in country's' curricula, practice (and policies) varies a lot within Europe.** Future project could prior to the application stage and formation of the methodology employed discuss the possibility **to design the policy experiment in a way to allow the feedbacks on student/school level**. As European practice in some international large-scale assessments already exists, e. g. European regional module in the IEA' ICCS study, taking into account a proper sampling, to **add "European module" in transversal skills in these studies – international large-scale assessments would be an effective and efficient** way to collect and compare data within and between different European educational systems.

References

Fraillon, J., Ainley, J., Schulz, W., Friedman, T., & Gebhardt, E. (2014). *Preparing for life in a digital age: the IEA international computer and information literacy study (International report)*. Dordrecht: Springer Open.