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## **Guidelines for the pedagogical use of mobile devices in the European Schools**

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# Introduction

## 1. European Union context

The digital transition can be referred to as the ‘fourth industrial revolution’<sup>1</sup>. It is speedily bringing digital technologies into all areas of everyday life, affecting them in unprecedented ways. Over the past two decades, digital technology has completely changed the way in which we interact, communicate, inform, create, express ourselves, work, entertain, consume and learn.

The digital revolution is continuing to accelerate - bringing major changes in education systems. It is leading education systems to consider the importance of supporting learners so that they adopt a creative stance and develop a critical view of digital technology. Education systems play a leading role in taking ownership of and mastering digital technology. Today, they must not only adapt to the digital age, but above all harness its full potential for students and teachers<sup>2</sup>.

As summarised by Eurydice:

“Digital technologies have revolutionised our society, and children today grow up and live in a world where these are ubiquitous. The 4th industrial revolution [...] affects all aspects of life, from health to commerce, from social interactions to the way people work. Education systems are no less affected, not only because technology can impact on the way education is delivered, but also because education has a role to play in preparing young people for a tech-driven world. Moreover, as research shows, growing up in the digital age does not make ‘digital natives’ [...] inherently competent and confident with digital technologies [...]. Students still need support in acquiring the right skills, even though surveys indicate that the use of technology is to a great extent restricted to non-school leisure time activities, while engagement with technology for educational purposes in schools lags behind [...]”<sup>3</sup>

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<sup>1</sup> After the mechanical revolution in the 18th century, the electrical revolution in the early 20th century and the computer and telecommunications revolution in the 1970s. The term ‘fourth industrial revolution’ was originally coined by Schwab, K. (2016). *The Fourth Industrial Revolution*. New York: Crown Business. See also European Commission (2016). *The Fourth Industrial Revolution*. [online] Available at: <https://ec.europa.eu/digital-single-market/en/fourth-industrial-revolution> [Accessed 19 January 2020] and European Commission, European Political Strategy Centre (2019). *10 Trends Shaping the Future of Work in Europe*. [online] Available at: [https://ec.europa.eu/epsc/sites/epsc/files/10-trends\\_future-of-work.pdf](https://ec.europa.eu/epsc/sites/epsc/files/10-trends_future-of-work.pdf) [Accessed 19 January 2020].

<sup>2</sup> Adapted from Government of Québec, *Ministère de l'Éducation et de l'Enseignement supérieur* (2018). *Plan d'action numérique en éducation et en enseignement supérieur*. [online] Gouv.qc.ca. Available at: <http://www.education.gouv.qc.ca/dossiers-thematiques/plan-daction-numerique/plan-daction-numerique/> [Accessed 19 January 2020].

<sup>3</sup> Eurydice - European Commission (2019). *Eurydice Brief: Digital Education at School in Europe* [online]. Available at: [https://eacea.ec.europa.eu/national-policies/eurydice/content/eurydice-brief-digital-education-school-europe\\_en](https://eacea.ec.europa.eu/national-policies/eurydice/content/eurydice-brief-digital-education-school-europe_en) [Accessed 21 January 2020].

With this perspective in mind, and as part of delivering on the New Skills Agenda for Europe<sup>4</sup>, in 2018, the Council of the European Union proposed a revised European Reference Framework of Key Competences for Lifelong Learning<sup>5</sup> that sets out the knowledge, skills and attitudes which people need for life that fosters digital competence:

“Digital competence involves the confident, critical and responsible use of, and engagement with, digital technologies for learning, at work, and for participation in society. It includes information and data literacy, communication and collaboration, media literacy, digital content creation (including programming), safety (including digital well-being and competences related to cybersecurity), intellectual property related questions, problem solving and critical thinking.”

The European Commission has promoted and detailed digital competence across several frameworks<sup>6</sup>.

It is important to consider that, as a transversal competence, digital competence also helps with mastery of other key competences, such as communication, language skills, or basic skills in maths and science<sup>7</sup>.

In addition, following the Rome Declaration of March 2017, where EU Member States stressed their commitment to providing young people with the “best education and training”, the European Council called for training and education systems to be “fit for the digital age”<sup>8</sup>.

In this context, as part of the strategic framework for European cooperation in education and training (ET 2020)<sup>9</sup>, in 2018, the European Commission adopted the ‘Digital Education Action Plan’<sup>10</sup> to support technology use and the development of digital competences in education. As stated by the European Commission, “digital technology,

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<sup>4</sup> European Commission (2016). COM(2016) 381: A New Skills Agenda for Europe. [online] Available at: <https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX%3A52016DC0381> [Accessed 16 January 2020].

<sup>5</sup> Council of the European Union (2018). Council Recommendation of 22 May 2018 on key competences for lifelong learning (Text with EEA relevance).

<sup>6</sup> E.g. European Commission (2015). European Digital Competence Framework for Citizens (DigComp). [online] Available at: <https://ec.europa.eu/jrc/en/digcomp> [Accessed 17 January 2020].

<sup>7</sup> Vuorikari R. (2015). Becoming digitally competent: A task for the 21st-century citizen. [online] Available at: [https://www.schooleducationgateway.eu/en/pub/viewpoints/experts/riina\\_vuorikari\\_-\\_becoming\\_dig.htm](https://www.schooleducationgateway.eu/en/pub/viewpoints/experts/riina_vuorikari_-_becoming_dig.htm) [Accessed 31 January 2020].

<sup>8</sup> European Council (2017). EUCO 14/17: European Council conclusions of 19 October 2017. [online] Available at: <https://www.consilium.europa.eu/en/meetings/european-council/2017/10/19-20/> [Accessed 16 January 2020].

<sup>9</sup> European Commission (2018). European Policy Cooperation (ET 2020 framework). [online] Available at: [https://ec.europa.eu/education/policies/european-policy-cooperation/et2020-framework\\_en](https://ec.europa.eu/education/policies/european-policy-cooperation/et2020-framework_en) [Accessed 16 January 2020].

<sup>10</sup> European Commission (2018). Digital Education Action Plan. [online] Available at: [https://ec.europa.eu/education/education-in-the-eu/digital-education-action-plan\\_en](https://ec.europa.eu/education/education-in-the-eu/digital-education-action-plan_en) [Accessed 16 January 2020].

enriches learning in a variety of ways and offers learning opportunities, which must be accessible to all. It opens up access to a wealth of information and resources.” The Plan sets three priorities:

1. Making better use of digital technology for teaching and learning.
2. Developing digital competences and skills.
3. Improving education through better data analysis and foresight.

The Digital Education Action Plan includes initiatives supporting schools with high-speed broadband connections, scaling up a new self-assessment tool for schools on the use of technology for teaching and learning (SELFIE)<sup>11</sup> and a public awareness campaign on online safety, media literacy and cyber hygiene.

## 2. European Schools’ context

### 2.1. The mandate of the IT-PEDA strategy group

In December 2015, the Board of Governors created and gave a mandate to the IT Strategy Group<sup>12</sup>. This group is divided into two sub-groups:

- The IT-PEDA strategy sub-group’s remit is to deal with all subjects with a pedagogical objective.
- The IT-ADMIN strategy sub-group’s remit is to deal with all subjects from the administrative and financial angles.

#### Remit of the IT-PEDA strategy group:

- Suggest the actions required to ensure that pupils’ digital competence is properly enhanced at all stages of their education,
- Evaluate pilot projects launched in the schools involving pedagogical innovation in IT and deploy them in harmonised fashion in all the schools in the event of success,
- Propose models for IT use for pedagogical purposes, including for children with special educational needs,
- Review the role of IT in the organisation of studies and in syllabuses,
- Define guidelines and objectives for the training of teaching staff in IT,
- Put forward proposals to promote and facilitate the use of distance learning, in accordance with the European Schools’ strategy (observance of predefined technical and financial limits),

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<sup>11</sup> SELFIE (Self-reflection on Effective Learning by fostering the use of Innovative Educational Technologies) is a tool designed to help schools embed digital technologies into teaching, learning and student assessment. It can highlight what’s working well, where improvement is needed and what the priorities should be. See [https://ec.europa.eu/education/schools-go-digital\\_en](https://ec.europa.eu/education/schools-go-digital_en) and the internal SharePoint to assist European Schools SELFIE coordinators: <https://eursc.sharepoint.com/sites/ES-SELFIE>.

<sup>12</sup> European Schools (2015). 2014-11-D-13. Creation of a group responsible for indicating the IT strategy for communication, administrative and financial tools

- Put forward recommendations for the pedagogical use of environments for education and training, including remote ones,
- Ensure two-way communication with the end users of the European Schools' IT-PED system (pedagogical staff),
- Contribute to production of the annual ICT report by providing input in terms of uses of and pedagogical innovations associated with new information and communication technologies,
- Produce the multi-annual plan for IT-PEDA.

In the course of its work, the IT-PEDA strategy group was able to observe a number of school-led initiatives, some of which included projects to equip and use mobile devices for teaching and learning.

In particular, a BYOD pilot in Brussels IV has been implemented since 2015. As part of its mandate, the IT-PEDA strategy group followed and analysed this project, in order to learn from this pilot.

In addition, as part of its mandate, the IT-PEDA strategy group carried out a survey of more than 2,808 teachers in the system in 2017. This survey was conceived with regard to the use of new technologies for teaching purposes and in order to determine the current and future needs of teachers and to have more precise information on the current situation of the European Schools with regard to these new technologies. This survey also aims to better analyse the possibility of allowing the implementation of BYOD projects in other schools.

The results of this survey, as well as some recommendations resulting from it, are listed in the Report of the IT-PEDA strategy group (2018-01-D-22) and are appended to the ICT Report 2017 (2018-02-D-41)<sup>13</sup>. Among those recommendations, one question emerged as essential:

*“To what extent do we wish the European Schools to be digitally competent? Today, pupils are undeniably growing up with digital media and are using them in a most unaffected and uncontrolled way. In terms of skills, what would we wish them to achieve from which they could benefit in their future careers and lives?”*

In that connection, CoSup was asked in 2018 to help to obtain feedback concerning students who have recently left the European Schools. Although there is room for improvement in its administration, this feedback was not representative, but nevertheless highlighted the fact that a number of students interviewed noted that they were not sufficiently prepared for the use of new technologies. This is in line with European studies on the subject: because 'digital natives' are not digital experts and

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<sup>13</sup> European Schools (2018). 2018-02-D-41-en-3 ICT Report for 2017 + Annex: 2018-01-D-22-en-2 Draft Report on the IT-PEDA Survey.

because young people do not develop sophisticated digital skills just by growing up using digital devices<sup>14</sup>, proper training and digital learning are needed<sup>15</sup>.

The IT-PEDA strategy group learned from these experiences, which made it possible to specify some recommendations and proposals, such as in particular:

- digital competence is considered to be a key competence,
- measures are being taken by the European Commission to develop key competences and digital skills,
- expectations and needs are being expressed by the system's teachers,
- expectations are being expressed by several stakeholders in the European Schools for the development of digital competence in the system.

Consequently, it appeared that the IT Strategy Group should define as a priority a Digital Education Vision for the European Schools (DEVES). This priority was placed as objective No 1 (Operational objective) with absolute priority in the IT Multi-Annual Plan<sup>16</sup>.

## **2.2. Digital Education Vision (digital competence)**

The European Schools have for many years acknowledged and supported digitalisation in education.

More recently, understanding the need to put in place a more strategic and global approach to the development of digital competence as a key competence, whilst also focusing on its incorporation as a cross-curricular competence into school curricula. The Board of Governors of the European Schools approved the 'Digital Education Vision for the European Schools' (herein after referred to as the 'DEVES')<sup>17</sup>. The following is the key point:

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<sup>14</sup> Kirschner, P.A. and De Bruyckere, P. (2017). The myths of the digital native and the multitasker. *Teaching and Teacher Education*, 67, pp.135–142: “though learners in this generation have only experienced a digital connected world, they are not capable of dealing with modern technologies in the way which is often ascribed to them (i.e., that they can navigate that world for effective and efficient learning and knowledge construction)”.

See also Key findings from the International Computer and Information Literacy Study (ICILS) 2018. Fraillon, J., Ainley, J., Schulz, W., Friedman, T. and Duckworth, D. (n.d.). *Preparing for Life in a Digital World IEA International Computer and Information Literacy Study 2018 International Report* [online] Available at: <https://www.iea.nl/sites/default/files/2019-11/ICILS%202019%20Digital%20final%2004112019.pdf> [Accessed 31 January 2020].

<sup>15</sup> 44% of Europeans lack basic digital skills and less than 20% of ICT professionals are female, when 90% of future jobs will require digital skills. European Commission. (2019). *Digital Education Action Plan*. [online] Available at: [https://ec.europa.eu/education/resources-and-tools/document-library/digital-education-action-plan\\_en](https://ec.europa.eu/education/resources-and-tools/document-library/digital-education-action-plan_en) [Accessed 31 January 2020].

<sup>16</sup> European Schools (2018). 2018-01-D-79 - IT Multi-Annual Plan approved by the Board of Governors in April 2018. Absolute priority: the achievement of the target is vital for the correct functioning/improvement of the information system and/or the mitigation of a critical risk.

**“Every pupil and student develops throughout his/her European School education the digital competence to foster confident, critical, responsible and creative use of, and engagement with, digital technologies for learning, at work, and for participation in society.”**

This vision embraces pupils, teachers, schools and the system alike. It allows for coordination of the concrete actions enabling digital education to be developed in the European Schools. The document is an important step forward in the system’s development.

It is fully in line with the European Union’s strategy, associated in particular with the eight key competences for lifelong learning that young people ought to have acquired at the end of the compulsory education and training period – but also as adults during their life – thanks to formal, informal and non-formal learning opportunities. Digital competence, as one of the eight key competences, is also promoted in the recent ‘Proposal for a Framework for Key Competences for Lifelong Learning in the European Schools’<sup>18</sup>.

The European Schools are therefore encouraged to use technology for teaching and learning and to develop digital competence in all subjects and at all levels of education.

### **2.3. Current actions to support the DEVES**

The Board of Governors has mandated the IT-PEDA Strategy Group to develop measures to facilitate the implementation of this Digital Education Vision for the European Schools (DEVES). These measures will be developed gradually, which should then integrate them as new priorities, whilst respecting the Multi-Annual IT Plan<sup>19</sup>. At each stage, these measures will be accompanied, if necessary, by a document setting out the financial, human and technological needs related to their implementation.

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<sup>17</sup> European Schools (2019). Digital Education Vision for the European Schools system (DEVES) – 2018-12-D-7. Approved with immediate entry into force by the Board of Governors at its meeting of 9-12 April 2019: 2019-04-D-12-en-3. This document was based in particular on a survey conducted by the IT-PEDA strategy group during 2017 of more than 2,808 teachers in the system, which considered the use of new technologies for teaching purposes and assessed the current and future needs. The results, as well as some recommendations resulting from it, are listed in the Report of the IT-PEDA strategy group (ref: 2018-01-D-22) and are appended to the ICT Report 2017 (2018-02-D-41).

<sup>18</sup> European Schools (2018). Proposal for a Framework for Key Competences for Lifelong Learning in the European Schools (2018-09-D-67-en-3). This proposal received a favourable opinion from the JBI (October 2018, 2018-10-D-13-en-1) and was approved by the JTC (through written procedure No 2018-47), for immediate entry into force. See document 2018-09-D-69.

<sup>19</sup> European Schools (2018). 2018-01-D-79 - 2018-2022 IT Plan of the European Schools.

Some of the measures have already been adopted by the Joint Teaching Committee, the Budgetary Committee or the Board of Governors itself.

- Digital competence training courses are now part of the **amended Framework for Continuous Professional Development** in the European Schools<sup>20</sup>. In parallel with this decision, a specific budget has been granted to schools in order to be able to organise training courses on digital technology for teaching.
- Steps towards **online continuous professional development for teachers**, notably a range of **digital means of collaboration** gradually being put in place to foster professional learning communities, within schools and between schools: central hubs and chat-based workspaces (Microsoft teams), online webinars, MOOCs (e.g.: European Schoolnet Academy<sup>21</sup>, School Education Gateway “Teacher Academy”<sup>22</sup>), short-term and long-term projects (e.g. Teaching with Europeana<sup>23</sup>), etc.
- A **digital terminology list** is now in use in the European Schools<sup>24</sup>, and an extended version is currently being approved.
- A **common framework for digital competence**<sup>25</sup>, to be approved in October 2020 for immediate entry into force, is currently under development by the IT-PEDA strategy group. It will be supported by a set of **examples of learning activities**, in annexes to syllabuses, to help teachers implement digital competence.
- The development of annexes to syllabuses containing teaching and **learning activities on both digital and entrepreneurial competences**, with immediate effect in February 2021<sup>26</sup>. From a European viewpoint, it is apparently a clear

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<sup>20</sup> European Schools (2019). 2016-01-D-40 - Framework for and organisation of continuous professional development in the European Schools. Amended by: Decision of the Budgetary Committee at its meeting of 5 and 6 March 2019 in Brussels (2018-09-D-37-en-3).

<sup>21</sup> <https://www.europeanschoolnetacademy.eu/courses>

<sup>22</sup> [https://www.schooleducationgateway.eu/en/pub/teacher\\_academy.htm](https://www.schooleducationgateway.eu/en/pub/teacher_academy.htm)

<sup>23</sup> <https://teachwittheuropeana.eun.org>

<sup>24</sup> European Schools (2018). 2018-12-D-24 - Digital Terminology for the European Schools system. Approved by the Joint Teaching Committee at its meeting of 7 and 8 February 2019.

<sup>25</sup> European Schools (2019). 2019-09-D-50 - 'Common Framework for Digital Competence' (2018-09-D-32-en-1) – follow-up on Action 1.2. Approved by the Joint Board of Inspectors on 9 October 2019.

<sup>26</sup> European Schools (2019). 2019-09-D-50-en-2 – 'Common Framework for Digital Competence' (2018-09-D-32-en-1) – follow-up on Action 1.2”.

In the context of the European Schools, digital competence and entrepreneurial competence have been identified as currently not being sufficiently developed in the curricula. See Proposal for a Framework for Key Competences for Lifelong Learning in the European Schools, *ibid.*, p. 19-20.

It should be emphasised that while all eight key competences should be developed in the same way, European Commission stakeholders have a clear strategy of combining as much digital competence and entrepreneurship as possible in various actions and policies. See, for example, European Commission (2017). Stakeholders conference on the Digital Competence Framework for citizens (DigComp) and the Entrepreneurship Competence Framework (EntreComp). [online] Available at: <https://ec.europa.eu/jrc/en/event/conference/conference-digcomp-and-entrecomp> [Accessed 10 January 2020].



strategy to combine as much digital competence and entrepreneurship as possible in various actions and policies.

- A new **procedure for the approval of digital learning resources** within the European Schools has been established<sup>27</sup>.
- A new **Pedagogical Material site** (SharePoint) in place of the decommissioned Learning Gateway, as a common repository of digital teaching and learning resources.
- A new **Pedagogical Development Unit site** (SharePoint), to disseminate in particular guidelines and resources for professional development and implementation of the eight key competences.

The European Schools now benefit from a **unified digital environment**, for all staff and pupils. This set of cutting-edge digital tools offers cloud-based applications and services and allows there to be effective and secure work, communication, collaboration and sharing. It provides teachers with many opportunities for modern Continuous Professional Development, especially through peer learning and online communities of practices. It permits the sharing of pedagogical resources.

## 2.4. Context linked to the new digital tool for mathematics

The group of experts responsible for the choice of technological tool updated the recommended tool to be used in May 2019. Based on an analysis of comparative use of various technological tools in class, the group proposed the use of GeoGebra as a digital tool for teaching, learning and assessment in mathematics and physics<sup>28</sup>. For the other science subjects, it may be used for teaching, learning or assessment depending on needs.

Based on its different analyses, notably of the GeoGebra application, the WG issued recommendations and proposals for use of the tool in classrooms and examinations. These are contained in document 2020-01-D-76, also submitted to the JTC for approval in February 2020<sup>29</sup>.

In particular:

The Experts Working Group recommends, for the next school year (2020-2021), accompanying the entry into force of the new Mathematics and Physics S5 syllabuses by the following:

1. Teachers should use GeoGebra software in year S5 (just like for year S1) (open source application, free of charge, multilingual, multiplatform and with an exam mode).

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<sup>27</sup> European Schools (2020). 2020-01-D-9 - Annex to MEMO 2019-12-M-3/GM - Procedure to approve the use of a Digital Learning Resource within the European Schools.

<sup>28</sup> See Memo 2019-05-M-9

<sup>29</sup> European Schools (2020). 2020-01-D-76-en-1. A digital tool for teaching, learning and assessment in Mathematics and Sciences.

To avoid any impact on the Wi-Fi or on the IT structure of the school, the software could be used in offline mode.

Time for information about and teacher training in use of the GeoGebra software program has been scheduled for the next decentralised training course to be organised in spring 2020.

2. In view of the recommendations made by the IT-PEDA and IT-ADMIN strategy groups, and their conclusions concerning the pedagogical use of devices in the European Schools, pupils in year S5 must bring their own device to use the GeoGebra application in the classroom – at least in offline mode – from the next school year onwards. The Experts Working Group proposed some minimal technical recommendations for such devices (see Annex 1), and if the 'Guidelines for pedagogical use of mobile devices in the ES' (2020-01-D-14) are approved, recommends to the schools that they take it into account.
3. The decision of the Experts WG will have no financial impact on the European Schools' budget for the next school year.

The proposals made by the group of experts were the subject of in-depth analysis and collaborative work between the IT-PEDA and IT-ADMIN strategy groups, as well as with the group of experts in charge of choosing the technological tool. This led to the need to develop guidelines to support schools in educational use of mobile devices, particularly in a BYOD context.

## 2.5. The need to train the teachers

Experimental evidence suggests that the provision of digital technologies can lead to improved learning outcomes and that the positive effects of digital learning technologies are consistent across a range of educational outcomes<sup>30</sup>.

As technology cannot compensate for poor teaching<sup>31</sup>, the central role of teachers in the effective educational use of digital technologies cannot be overstated. To ensure successful integration of digital technologies into education, a good level of digital skills on the part of teachers is crucial.

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<sup>30</sup> European Commission - Joint Research Centre (2017). Digital Education Policies in Europe and Beyond: Key Design Principles for More Effective Policies. [online] Available at: <https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/digital-education-policies-europe-and-beyond-key-design-principles-more-effective-policies> [Accessed 21 January 2020]. See in particular § 3.2 and 3.3.

<sup>31</sup> "technology can amplify great teaching, but great technology cannot replace poor teaching": OCDE (2015). Students, Computers and Learning: Making the Connection [online] Available at: <https://doi.org/10.1787/9789264239555-en> [Accessed 21 January 2020].

With that in mind, the OECD Schools for 21st-Century Learners study<sup>32</sup> identifies three key ingredients required to embed technological innovation into effective 21st century schools:

1. Teachers' confidence in using digital technologies in a pedagogically meaningful way.
2. Teachers' willingness to innovate through these technologies.
3. Strong school leaders, who are assumed to establish the school-level conditions that enable the first two ingredients to flourish.

In parallel with these general considerations, the IT-PEDA strategy group reached the same conclusions, in particular through the survey launched in 2017 and presented in 2018 (2018-01-D-22). This survey clearly showed a lack of digital competence on the part of teachers and the need to develop a specific training policy for effective educational use of digital technologies.

Developing measures to enhance the digital competence of teachers already in post and new teachers is essential. In this respect, the expected level of proficiency in digital literacy, as mentioned in the 'Teaching standards' document (2012-09-D-11), should be enhanced.

In addition to in-service training courses, both general and specific horizontal training should be organised, in which form an important channel for exchange of good practices (e.g. subject-related practices) and other information could be provided.

The IT-PEDA strategy group survey concluded that overly teacher-centred application of ICT and lack of interactivity were obstacles that needed to be tackled. It was also stated in the report on the survey that the use of ICT should become a more natural part of teaching and learning. As regards the training needs of teachers, the survey demonstrated that there are some areas which need to be targeted. Training courses should

- enhance creation of digital materials capability,
- encourage teachers to exploit the interactivity of ICT tools (according to the survey, many teachers tend to use tools for frontal teaching),
- also target subject-specific areas.

Digital competence training courses are now part of the amended Framework for Continuous Professional Development in the European Schools<sup>33</sup>. In parallel with this decision, a specific budget has been granted to schools in order to be able to organise training courses on digital technology for teaching.

As stated in the amended CPD framework, digital training could be done system-wide (at central level) or at school-level. At a third level, every teacher is responsible for his

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<sup>32</sup> Schleicher, A. (2015). Schools for 21st-Century Learners: Strong Leaders, Confident Teachers, Innovative Approaches, International Summit on the Teaching Profession. Paris: OECD Publishing.

<sup>33</sup> European Schools (2019). 2016-01-D-40 - Framework for and organisation of Continuous Professional Development in the European Schools. Amended by: Decision of the Budgetary Committee at its meeting of 5 and 6 March 2019 in Brussels (2018-09-D-37-en-3).

or her further professional development in this area. In addition to this, it is supported by online courses offered free of charge centrally.

## **2.6. The need for recommendations for digital equipment**

Digital competence is essential for learning, work and active participation in society. The only way to develop it is by learning digitally.

With that in mind, to help teachers to develop pupils' digital competence and digital literacy<sup>34</sup>, as well as general learning outcomes, it appeared necessary to make recommendations to the European Schools for connected mobile equipment to be used by pupils.

The next section presents concepts, examples and general recommendations. It concludes with a table of equipment recommendations according to school cycles.

The document also contains several annexes:

- Annex 1: Guide to educational projects based on the use of mobile devices.
- Annex 2: Draft Project Plan ES, Munich Project Plan 'Media Education at the ESM'.
- Annex 3: Bring Your Own Device Policy – Example.
- Annex 4: Criteria for choosing mobile devices and related technologies.

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<sup>34</sup> Digital literacy refers to “students’ ability to use computers to investigate, create and communicate in order to participate effectively at home, at school, in the workplace, and in the community”. See IEA (International Association for the Evaluation of Educational Achievement) ed., (2018). ICILS - International Computer and Information Literacy Study. [online] Available at: <https://www.iea.nl/studies/iea/icils> [Accessed 19 January 2020].

# General recommendations for mobile equipment and services in schools

## 1. General recommendations

The basic equipment<sup>35</sup> of a classroom, across all school cycles, should involve mobile devices (individual or shared) allowing:

- transmission of the signal from a tablet or laptop to a collective screen, interactive writing,
- high-speed, secure and high-performance internet connection thanks to professional-quality Wi-Fi terminals with low electromagnetic radiation,
- secure and, in accordance with data protection regulations, certified cloud storage space.

**Minimum technical standards** must be followed, with each school remaining in control of their application. They should cover in particular:

- One device per teaching station, ideally comprising a graphical user interface and allowing mobile use, including standing in front of the pupils.
- According to cycle, sufficient digital tools for use in small groups (e.g. Nursery to S3) or, progressively, one device per pupil (such as a touch tablet for younger pupils); BYOD must be practised at upper secondary level (S5-S7).
- A protected cloud, with individualised storage spaces allowing both exporting and loading of data in a secure environment (this solution is currently available to the European Schools with Microsoft O365).
- Electrical equipment with sufficient connection sockets.
- A secure and high-performance Internet connection, with high speed for a small school and ultra-high speed for a larger establishment; the speed will be adapted to the intensity of activity and simultaneous connections, as well as to the specific tasks carried out in the courses of study present in the establishment.
- Wi-Fi access points of professional quality and low radiation, allowing multiple simultaneous connections, to be adapted according to the type of establishment and according to technological developments.
- Technical solutions should reduce electromagnetic radiation in the classroom, ideally 'smart Wi-Fi'; in particular, it is possible to equip classrooms, in certain

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<sup>35</sup> Some of the general recommendations proposed in this section are based on *Conférence intercantonale de l'instruction publique de la Suisse romande et du Tessin (2018). Adoption d'un plan d'action et lancement des travaux de coopération en faveur de l'ÉDUCATION NUMÉRIQUE dans l'espace latin de formation*. [online] Available at: [https://www.ciip.ch/files/2/CIIP\\_Decision\\_Plan-action-numerique\\_2018-11-22.pdf](https://www.ciip.ch/files/2/CIIP_Decision_Plan-action-numerique_2018-11-22.pdf) [Accessed 19 January 2020].

year groups, with a repeater box that can be disconnected by the teacher so that access to the network can be blocked in certain situations.

- A means of large-format projection per class, allowing remote interactivity, with sufficient sharing and brightness criteria (e.g. touch screen or TV with integrated speakers, allowing writing by means of dedicated software on the tablets); in the future, interactive whiteboard (IWB) solutions should be replaced by devices that are less prone to rapid obsolescence by relying on remote interactive systems (transmission of the signal from a tablet or laptop to a screen); the collective projection of the digital signals must be guaranteed and wiring should be kept to the minimum required.
- A Mobile Device Management (MDM) system is recommended, taking a mid-term view, to ensure the security of the devices (school-owned or personal) and to ensure compliance with the GDPR and data protection issues. A user-friendly MDM system helps teachers to keep the lead during lessons.
- Security measures concerning web filtering, data loss and device theft that must protect users. This implies auditing tools, strong authentication processes, updated IT policies and charters.

Technological change is rapid and will need to be considered in the gradual introduction of equipment.

## **2. Pedagogical benefits of mobile devices**

The use of mobile digital devices in schools is increasingly well documented, making it possible to clearly define the pedagogical advantages of these new practices.

### **2.1. Examples in major subject areas**

The many pedagogical scenarios resulting from the use of digital tools can relate to all disciplines. The few examples below illustrate different pedagogical activities<sup>36</sup>.

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<sup>36</sup> The following example are adapted from Republic and Canton of Geneva, *Secrétariat du Grand Conseil* (2019). *Projet de loi PL 1294 du 17 avril 2019*. [online] Available at: <https://ge.ch/grandconseil/data/texte/PL12494.pdf> [Accessed 19 January 2020]. These elements from research in educational sciences have been gathered in particular by the TECFA research unit at the University of Geneva.

### **Cross-curricular activities**

Use of the device to enrich the portfolio (Nursery and Primary levels) and document pupils' accomplishments and progress.

Search for data and information online, share data and information with other through technologies.

Regardless of the subjects, the devices will help developing students' digital skills.

More generally, the eight key competences can be facilitated by the use of digital technologies in class.

**Languages.** Comprehension and production of the spoken word benefit from the recording and sound broadcasting functionalities of mobile equipment. The same is true with word processing software and writing, which complement learning on paper. This diversification of pedagogical approaches strengthens the integration of pupils with special educational needs.

**Scientific approach.** A digital mobile device facilitates research, observation and analysis. Students can access interactive animations online. For example, they can photograph and analyse the different stages of a plant's life cycle or the shadows related to the path of the sun. He or she can record the key stages of an investigation and then share it with the whole class.

**Mathematics.** Many online applications offer targeted training, e.g. on the four operations, keeping track of the trials and can be adapted according to student errors. In geometry, photographing objects allows students to reproduce them. Access to easy-to-use online 3D models or tutorials also provides significant added value.

**Human Sciences (history and geography).** The official teaching aids offer pupils the opportunity to create digital documents combining text, images and sound.

The Internet, for its part, is full of historical and geographical information, such as interactive maps and plans, photos of yesterday and today. With capture tools (camera, recorder, etc.) pupils can make their own records (especially with a tablet).

Comparisons with documents obtained on the Internet and those completed or produced in class allow students to address such essential concepts as permanence and change, rigour, reality, etc.

**Art.** Digital equipment promotes awareness of different artistic expressions. It is easy to project a film, to broadcast a musical work and to show a masterpiece with such a tool. The teacher can also encourage the development of pupils' creativity by illustrating different musical, film or pictorial genres, drawing on huge databases. Then by proposing teaching activities that enable pupils to produce their own works, even if it means mixing artistic expressions: adding sound to a film, moving a painting, hijacking a photograph, etc.

**Physical education.** The use of digital technologies has become essential in the field of sport. It is indeed possible to compare, by watching it, an action or a succession of movements of a sportsman with what is expected. In a school setting, this will enable pupils to improve their practices.

## **2.2. Differentiation**

For any group of pupils, no matter the age range, the use of mobile devices is particularly suitable, as it allows for pedagogical differentiation. In addition to its usefulness in written and oral production projects, it can play a role in translation, listening (work on phoneme distinction) and lexical reinforcement.

## **2.3. Inclusive Education and Educational Support**

While there has been a gain in autonomy, increased motivation, facilitated collaboration and the possibility of differentiating the pace of work, it appears that mobile devices also promote the aims of the inclusive school.

Indeed, in the care of young children with special educational needs, the use of tactile tablets (or equivalent) may support development of specific skills in areas such as fine motor skills, communication (in particular by empowering, through verbal communication support, some children with autism spectrum disorders), the development of social skills, the development of general knowledge, through the use of ad hoc applications, developed specifically in the field of intellectual and sensory impairment.

Devices can also offer assistive technology (like text-to-speech) that can greatly improve the progress of students with learning differences or a combination of any of a broad range of unique learning abilities.

The mobile device is recognised as a particularly suitable tool in the field of specialised pedagogy, especially for the prospects of differentiation when implementing complex individualised educational projects aimed at best meeting the particular needs of young people benefiting from adapted measures.

As part of the discussion on special arrangements, the Board of Inspectors (Secondary) (June 2019) mandated the IT-PEDA strategy group to carry out a market analysis and identify the digital tools that can be used in the context of educational support, particularly during examinations. This analysis still needs to be carried out. The IT-PEDA strategy group will make recommendations to the Educational Support Policy Group which will decide whether to take them into account or to include them in the procedural document on educational support (2012-05-D-15).

## **3. Recommendations on mobile devices per cycle**

The following recommendations are intended to provide guidance to schools and are not mandatory.

In this context, in the document 'Digital tool for teaching, learning and assessment' (2020-01-D-76) related to the GeoGebra software/application, the Experts WG



considered that in order to run this software/application, the possession and classroom use of a digital device by each student are compulsory from S5 onwards. To avoid any impact on the Wi-Fi or on the IT structure of the school, the related application could be used in offline mode.

However, it is up to each school, from the start of the next school year, to decide the level of implementation according to their progress in a BYOD-type project.

In the table below, no device brands are mentioned or benchmarked.

Cycle-Level	Device type	Distribution	Configuration	Ownership	Status	Remarks
Nursery	tablet	shared <sup>37</sup> or 1 per class <sup>38</sup>	Scenario '1: many': shared devices between several classes (mobile carriers: trolley, case)	School	Highly recommended	A tablet is preferred for portability and multifunctionality.
	2-in-1					
	laptop computer					
Primary (P1-P3)	tablet	Shared or 1:1	Shared devices between several classes (mobile carriers: trolley, case) or assigned to a class (shelf with electric loading).	School	Highly recommended	1:1 could be applicable for certain learning environments
	2-in-1					
	laptop computer					
Primary (P4-P5)	tablet	Shared or 1:1	Shared devices between several classes (mobile carriers: trolley, case) or assigned to a class (shelf with electric loading)	School	Highly recommended	1:1 could be also emphasised in P5 for the transition to S1.
	2-in-1					
	laptop computer					
Secondary cycle 1 (S1-S3)	tablet	Shared or 1:1	Shared devices between several classes (mobile carriers: trolley, case) or assigned to a class (shelf with electric loading)	School	Highly recommended	
	2-in-1					
	laptop computer					
Secondary cycles 2-3 (S4-S7)	tablet	Shared or 1:1	S4: shared devices between several classes (mobile carriers: trolley, case) or assigned to a class (shelf with electric loading) or BYOD <sup>39</sup>  S5-S7: 1:1 with BYOD	School or student	Highly recommended in S4  Compulsory in S5-S7 <sup>40</sup>	
	2-in-1					
	laptop computer					

N.B.: Smartphones (multifunction mobile phones) are not highly recommended, but may be used with pedagogical benefit when appropriate within schools' guidelines.

<sup>37</sup> 1: many (e. g. 1 device for 2 pupils). Ratio for shared tablets: ideally, one tablet for two students should be provided.

<sup>38</sup> The teacher can then work successively with small groups. It is hardly possible to conceive of an autonomous pedagogical activity on a mobile device at nursery school level.

<sup>39</sup> BYOD: Bring You Own Device, within the technical specifications recommended by the school.

<sup>40</sup> Compulsory implementation of a 1:1 model, at least in S5 in 2020-2021 (linked with the mathematics and physics syllabuses). Nevertheless, within the framework of their budget and resources, the schools may choose to provide devices to pupils.

## 4. Proposal

These guidelines for pedagogical use of mobile digital devices in the European Schools are intended to respond to the mandate given by the Board of Governors to the IT Strategy Group (and in particular to the IT-PEDA strategy group). They have been drawn up in collaboration with and with the assistance of the IT-ADMIN strategy group, as regards in particular the administrative, technical and security dimensions. The Legal Assistant and the Data Protection Officer of the Central Office were also involved in drawing up these guidelines. All the system's stakeholders were represented in both working groups.

The content of these guidelines is based on several recommendations emanating from the various surveys, observations, research and consultations carried out by the IT-PEDA strategy group regarding, on the one hand, the level of digital competence of teachers and of pupils in the European Schools and, on the other, implementation in a school of a BYOD project.

These guidelines are intended to serve as **recommendations** to schools as they consider the pedagogical implementation of digital competence, as one of the eight key competences to be fostered, and the digital equipment to support such implementation, including BYOD projects. **The following recommendations are intended to provide guidance to schools and are not mandatory.**

These guidelines are closely linked with the introduction of a **new compulsory digital tool** associated with the new mathematics and physics syllabuses from the start of S4 in the 2019-2020 school year, replacing the TI-Nspire graphing calculator. This tool (GeoGebra software/application) requires individual use of a digital device starting in S5, at the beginning of the 2020-2021 school year.

In this context, in the document 'Digital tool for teaching, learning and assessment' (2020-01-D-76) related to the GeoGebra software/application, the Experts WG considered that, in order to run this software/application, the possession and classroom use of a digital device by each student are compulsory from S5 onwards. To avoid any impact on the Wi-Fi or on the IT structure of the school, the related application could be used in offline mode.

On the basis of the recommendations made in a coordinated effort by the various working groups on the subject (IT-PEDA, IT-ADMIN and Experts WG in charge of choice of the technological tool), and in order to be able to implement the new S5 mathematics and physics syllabuses from the 2020-2021 school year onwards, it appeared that the most suitable conclusion was to make it compulsory for pupils, from S5 onwards, to have a personal mobile digital device for classwork (BYOD). Nevertheless, within the framework of their budget and resources, the schools may choose to provide devices to pupils.

This obligation, which concerns S5 in particular for next year (2020-2021), will gradually become compulsory for years S6 and S7 (from the year 2021-2022). However, it is up to each school, from the start of the next school year, to decide the level of implementation according to their progress in a BYOD-type project.

This means that although the use of an individual digital device from S5 at the beginning of the next school year (2020-2021) is compulsory, this does not make it compulsory to introduce a full BYOD project for schools next year, covering all subjects. The schools naturally retain their autonomy to decide the most appropriate time to implement such a project, according to the progress of their pedagogical project (if applicable) and depending on the resources that they will require from a technical, human and financial viewpoint to implement it.

## **5. Opinion of the Joint Board of Inspectors**

The Joint Board of Inspectors gave a favourable opinion on the *Guidelines for pedagogical use of mobile devices in the European Schools* and recommended to the Joint Teaching Committee to approve it with an entry into force as September 2020.

## **6. Decision of the Joint Teaching Committee**

The Joint Teaching Committee approved the *Guidelines for pedagogical use of mobile devices in the European Schools* providing guidance for implementation of pedagogical projects with digital devices. The guidelines would enter into force as of September 2020. The document would be regarded as constantly evolving and would be adapted in the light of current digital innovations. In case of major changes made to the document, it would be resubmitted for approval. This document will also be subject to updating in accordance with the various decisions taken by the respective Boards that may have an impact on these guidelines.

Furthermore, the Joint Teaching Committee mandated the IT PEDA WG to conduct, in three years' time, an evaluation of the recommendations for mobile digital devices by cycle and to revise the table on mobile devices if needed. Based on the needs and progress of digital teaching and learning projects in schools, the IT PEDA WG might make further recommendations to the Joint Teaching Committee as to whether the 'highly recommended' should become 'compulsory'.



# Annex 1

## Guide to educational projects based on the use of mobile devices

### 1. Key Concepts<sup>41</sup>

#### 1.1. Objectives and positioning of the document

This document is a guide to using mobile devices / BYOD projects. As such, it aims to be a practical and operational entry point for mobile devices project holders.

It thus brings together a set of advice, recommendations and good practices that are useful, and even necessary, for developing and implementing a mobile devices project. In this way, it constitutes a guide which, through a pragmatic approach, allows to gather all the elements that can provide support on the various issues specific to mobile devices projects by dealing with technical, organisational, legal and pedagogical aspects.

This document is not a master plan providing complete requirements for the realisation of specifications. It is based on existing reference documents when necessary.

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<sup>41</sup> Main sources used in this section:

- French Ministry of Education (2018). Guide des projets pédagogiques s'appuyant sur le BYOD/AVEC V1.2 (MàJ du 26/07/2018), [online] Available at: <https://eduscol.education.fr/cid128686/guide-des-projets-pedagogiques-s-appuyant-sur-le-byod-avec.htm> [Accessed 10 January 2020].
- European Schoolnet. (2020). BYOD - Bring Your Own Device - FCL. [online] Available at: <http://fcl.eun.org/cs/byod> [Accessed 8 January 2020].

## 1.2. Definition of a mobile equipment

The types of devices that fall within the scope of this document are as follows:

- tablet
- convertibles (2 in 1)
- laptop computer

Mobile phones (not smartphones) and other digital products (e.g. connected clothing) are not included in the scope.

Smartphones (multifunction mobile phones) may be used with pedagogical benefit when appropriate, within schools' guidelines.

## 1.3. Definition of a mobile device project

A mobile device project is a project to consider digital equipment in the life of the school. A mobile device project:

- begins as soon as there is a will of the school (except when compulsory at system level);
- is based on a pedagogical school project;
- can exist with or without integration into the institution's network infrastructure, both modes (online and offline) are included in the scope;
- can be part of an institutional project proposing mechanisms facilitating the acquisition of equipment and its implementation in schools: financial assistance to families, framing of devices for the purchase of equipment (guidance, negotiation...), infrastructure...

## 1.4. Definition of BYOD project

BYOD (Bring Your Own Device) refers to use in the school setting of personal digital equipment for which the responsibility does not lie with the school or the community.

The school environment is defined as the time and place where the student is placed under the responsibility of the educational institution and where the internal rules of the establishment, school or boarding school apply.

### 1.5. Mobile device strategy - Control versus Risk/Support Complexity

Finding the right balance between control and risk/support complexity and deciding what are acceptable levels of risk are key elements in the development of a school strategy<sup>42</sup>.

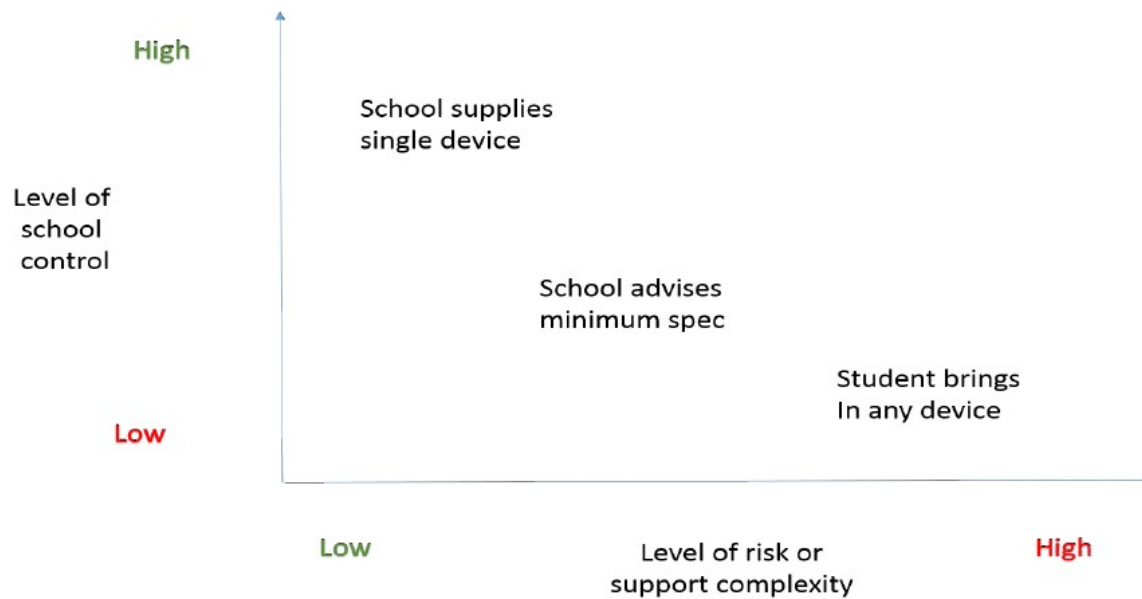


Figure 1: Mobile Device Strategy - Control v Risk/Support Complexity

<sup>42</sup> Attewell, J. (2017). BYOD - Technical Advice for School Leaders and IT Administrators. [online] European Schoolnet. Available at: <http://fcl.eun.org/cs/byod> [Accessed 14 January 2020].



# 1. THE MAIN STAGES OF A MOBILE DEVICE PROJECT

The school director and the pedagogical team lead the project, in collaboration with all the stakeholders: parents, students, school staff and other community members.

The development of a project can be schematized around major stages:

<b>1. Defining the project and forming a project team</b>	<b>2. Identifying initiatives and triggers</b>	<b>3. Define the objectives of the project and the implementation process</b>	<b>4. Determining necessary actions for organisational, technical and legal components</b>	<b>5. Teacher training</b>	<b>6. Starting operation and supervision of the project</b>
<b>7. Driving change</b>					
<b>8. Evaluating and adapting</b>					

Table 1: Steps of a project

## 1.6. Step 1: Defining the project and forming project team

Defining the mobile device / BYOD project is the result of a joint decision and a shared vision within the school. It can be part of a strategy to respond to local objectives and constraints, for example, taken by considering the overall socio-economic context, the relationship with local partners, with parents' associations, with associations or local economic actors...

The project team should include representatives of the school management, IT department and teachers.

### 1.7. Step 2: Identify initiatives and triggers

In order to prepare a project, it is important to identify the elements that will facilitate the subsequent stages: feedback from projects and documentary sources can help to draw up an inventory.

Identify already existing projects

An overview of existing literature

### 1.8. Step 3: Define project objectives and implementation approach

This stage involves setting up a simplified project management methodology after having defined structured objectives with the project partners.

Describe structured objectives

The definition of the project's objectives seems to be an obvious step. Their formalisation is very often drowned in the midst of short-term actions for project launch and constraint management. It is strongly recommended to establish precisely (in a dedicated document, which can be reused during the actions of communication/support) the objectives to be achieved through the implementation of the project in the school.

There are several methods for concretely defining objectives. The example below illustrates the SMART method which is based on a simple principle: any objective must be structured to deliver the desired result.

<b>S</b>	<b>M</b>	<b>A</b>	<b>R</b>	<b>T</b>
Specific	Measurable	Ambitious	Realistic	Time-based
G	O	A	L	S

According to the SMART method, the project objectives must meet the following five criteria:

- **S** for Specific and simple: the objectives must be clearly and precisely defined. If they are too general, they are usually unattainable. The objectives must also be expressed simply and intelligibly so that they can be understood by as many people as possible.
- **M** for Measurable: Objectives must be quantifiable and quantifiable. This makes it possible to define the value of the measure to be achieved. It will thus be possible to monitor progress throughout the project and potentially to make any necessary adjustments.
- **A** for Ambitious and Achievable: the objectives must be ambitious enough to encourage the involvement of the different actors but at the same time achievable and concrete enough to allow the measurement of an evolution in their achievement.
- **R** for Realistic: the objectives aim to adapt to the reality and context of the project. For this, it is necessary to ensure the involvement of the main actors of the project but also the availability of means human and financial resources essential to the project.
- **T** for Time-based: the objectives must be delimited in time to facilitate the monitoring of the project schedule and avoid potential drifts that could be a source of additional costs.

#### 1.9. Step 4: Determine the necessary actions for organisational, technical and legal aspects



## Organisational Modalities

Once the objectives and approach have been established, the activities addressing the organisational, technical and legal aspects of the mobile device / BYOD project must be carried out to launch the project.

Define the **logistic organisation** to be anticipated before the arrival in class:

1. Invite students to verify that the necessary applications are installed on personal equipment
  2. Ensure that personal equipment is in good working order
- Define the organisation of **pedagogical activities** and the **use of personal equipment** during the mobile device / BYOD sequence.



## Technical Modalities

- Analyse the **means of connection** necessary for the uses targeted by the mobile device / BYOD project. N.B.: some pedagogical applications can be used offline (e.g. GeoGebra).
- Ensure that the **Wi-Fi** network is designed to ensure a high quality of service, in conjunction with community partners. For this, it will be necessary to:
  1. Identify the different types of target uses of the school's network (downloading content, sending educational productions to storage spaces, video streams, etc.). This step will help to define the school's needs in terms of the bandwidth required for educational uses.
  2. Estimate the number of equipment simultaneously connected to the Wi-Fi network in order to measure its capacity to accommodate equipment.
  3. Determine the perimeter of users (students, teachers, staff) likely to connect to the school's Wi-Fi network.

4. Locate where a network connection is required in order to establish a Wi-Fi network coverage map within the facility.
- Define how users can **access the Wi-Fi network** from their equipment (e.g. how the user connects to the network, with what level of security...).
  - Ensure that the Wi-Fi network is **secured** to make it less vulnerable, for example, by setting up firewalls and antivirus software to prevent equipment from being infected by malware (malicious software). This approach will also avoid the use of the network infrastructure by inappropriate people or programs seeking to access personal data.
  - Ensure that a **filtering system** is put in place to meet regulatory obligations and can be ideally set according to the needs of various categories of users.
  - Set up the **modalities for sharing pupil/teacher resources** within the framework of a mobile device / BYOD project (data storage and sharing tools, connection with the services of the ENT, collaborative tools...).
  - Setting up **secure electrical recharging solutions** for students' personal equipment.



#### Juridical Modalities

- Make changes to the internal regulations and to the **digital usage policy/charter** concerning the use of mobile equipment within the establishment.
- Follow the **recommendations and good practices** (compliance of processing operations with the GDPR and the national applicable laws, etc.).

### 1.10. Step 5: Teacher Training

The arrival of digital technology in the school environment has changed teaching practices. The mobile device / BYOD brings changes that students, pedagogical teams and especially teachers must grasp. Some good practices can usefully be put in place to take advantage of personal equipment while ensuring compliance with the internal rules and the charter of digital usage.

With reference to local training, each school should set up a training plan.

- Inviting experts/trainers is an obvious starting option.

- Most teachers could be reached by a series of peer-to-peer trainings: when e.g. a member of the staff who is already skilled in this area could organise demonstrations/workshops where the practical classroom application of the devices is demonstrated and discussed.
- Members of the project team could play an active role here.

With reference to the centralised training, Inspectors have been invited to enforce the digital competence throughout the syllabuses during their training sessions.

With reference to the individual training, teachers are invited to participate on online training, especially through communities of practices.

Digital competence training courses are now part of the amended Framework for Continuous Professional Development in the European Schools<sup>43</sup>. In parallel to this decision, a specific budget has been granted to schools in order to be able to organise training courses on digital technology for teaching.

**It is highly recommended that schools plan at least six months of training prior to the implementation of a BYDO project, in order to create a prior digital culture.**

### **1.11. Step 6: Start Project Operation and Supervision**

The implementation of the mobile device / BYOD at the service of the pedagogical practices and educational missions of the establishment really starts once the stages of preparation of the organisational, technical and legal modalities have been carried out and the initial information/training actions undertaken. From then on, the project enters the so-called "operation and supervision" phase.

Operating and supervisory activities are aimed at monitoring and ensuring, for all stakeholders, compliance with the following the rules put in place and the proper functioning of the services.

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<sup>43</sup> European Schools (2019). 2016-01-D-40 - Framework for and organisation of continuous professional development in the European Schools. Amended by: Decision of the Budgetary Committee on its meeting on 5 and 6 March 2019 in Brussels (2018-09-D-37-en-3).

## 1.12. Step 7: Driving Change

Change management is a key factor in the success of any project. mobile device / BYOD introduces new possibilities of use in the school, and consequently new rules. It represents a major upheaval for all stakeholders:

- **Teachers** will have to consider an environment where students are equipped with a variety of materials and are technically more autonomous. To this end, training and support for teachers and supervisory staff must be part of the mobile device / BYOD project and should be carried out in collaboration with the OSG and in-service teacher training;
- **Students** will be encouraged to develop the uses they make of their personal equipment (rules defined in the "Rules of the Road" section by the teacher and consistent within the institution). Within the framework of a mobile device / BYOD project, the uses are supervised and subject to the rules defined by the teacher. They must also comply with the rules and the digital usage policy/charter. It is, therefore, necessary to inform students about their responsibilities and to support them in using and complying with the new terms of their responsibilities.
- The **administrative and school life staff** will also have to adapt and accompany pupils and teachers in the use of the new devices that may be put in place during the mobile device / BYOD project (such as the provision of equipment in case of unavailability of personal equipment or the storage of equipment). They must also ensure compliance with the new rules set out in the internal regulations and the policy/charter of digital practices.
- **Parents** (or legal guardians) must be made aware and mobilised from the very first stages of the project. Indeed, whatever the method of equipment acquisition adopted, parents must authorise their children to use their personal equipment for the following purposes pedagogical. It seems relevant to check that parents have fully understood the specificities and impacts of the project by submitting for their signature authorization for the use of the personal equipment in the school. Information and training for parents must be planned from the very beginning of the project to obtain their adhesion (in particular in the case of financial participation) and so that they can be informed educational activities carried out by their children on their personal equipment.

In order to accompany the transformation linked to mobile device / BYOD, change management is necessary throughout the project because it allows to identify possible points of tension and rejection factors while facilitating the adhesion of the actors. A support plan should be determined from the start of the BYOD project in order to identify all the actions to be taken: information, training, communication and accompaniment.

### 1.13. Step 8: Evaluate and Adapt

In order to carry out the evaluation, it must be organised from the beginning of the project around three main axes:

1. **Choosing indicators and tools:** It is important to define upstream and share the different indicators that will be used to evaluate the project, whether they are indicators for monitoring the project (output and result indicators) or impact indicators (pedagogical practices, pupil results, etc.).
2. **Collecting and analysing data:** The data collected through the indicators and tools should then be analysed, then synthesised and reported back to the steering committee. It is therefore essential to define from the start of the project who is responsible for these actions and to allocate the necessary resources. The information can be automated feedback or be collected through surveys or polls. Their analysis must aim to highlight the most significant results as well as blocking points.
3. **Adapt the objectives and implementation modalities:** It will be necessary to take into account the information provided, decide whether adjustments are necessary.

In this perspective, the **SELFIE** tool proposed by the European Commission will be very useful: [https://ec.europa.eu/education/schools-go-digital\\_en](https://ec.europa.eu/education/schools-go-digital_en)

A dedicated SharePoint site is available to European Schools coordinators: <https://eursc.sharepoint.com/sites/ES-SELFIE>



**EXAMPLE:** the following table is a proposal to guide the implementation in the schools.

Aims	Possible actions
Definition of the Mobile device project	<ul style="list-style-type: none"> <li>• To agree on the project in the Management</li> <li>• To set up school's specific goals</li> <li>• To create a project group to specify the project's objectives</li> </ul>
Validate the project	<ul style="list-style-type: none"> <li>• Project is presented in the Educational Council and SAC</li> <li>• Project is approved by the Admin Board</li> </ul>
Communicate about the project to all the stakeholders (staff members, parents, pupils, institutions, etc.)	The project is presented in the general conference and discussed in the departments and with the pupils (grade meeting).
Make an inventory of the existing situation regarding infrastructure, devices, budget, digital skills of teachers, digital content and licences	<ul style="list-style-type: none"> <li>• Receive feedback from coordinators, IT technicians and DDFA</li> <li>• Research about digital school books and school licences</li> <li>• Use SELFIE</li> </ul>
Set up a teachers' training plan	<ul style="list-style-type: none"> <li>• Define priorities (starting with Teams and OneNote)</li> <li>• Clarify the proposed training levels</li> </ul>

	<ul style="list-style-type: none"> <li>• Create a team of trainers for in-service trainings and for using on-line trainings (<a href="#">Microsoft Educator Center</a>)</li> <li>• Use the pedagogical days</li> </ul>
Focus the discussion on the pedagogical aims	<ul style="list-style-type: none"> <li>• Identify digital learning objectives, based on the existing syllabi</li> <li>• Identify digital resources and skills in each subject</li> <li>• Identify cross-curricular digital resources and skills (cf. common framework)</li> <li>• Include media education (topics: cyber-bullying, data protection, fake news, etc.)</li> </ul>
<p>Teachers' needs (content and licences) are communicated.</p> <p>Decisions are made (DPO-Director) to develop the digital resources</p>	<ul style="list-style-type: none"> <li>• Coordinators inform the management about the need</li> <li>• Teachers are informed about the decisions.</li> </ul>
Check/Improve the IT infrastructure	<ul style="list-style-type: none"> <li>• Bandwidth</li> <li>• Wi-Fi</li> <li>• Security issues</li> <li>• Charging infrastructure (consider fire prevention)</li> </ul>
Define minimum specifications	<ul style="list-style-type: none"> <li>• Set a price limit for the devices</li> </ul>

for the pupils' devices and communicate them to the parents	<ul style="list-style-type: none"> <li>• Involve the IT technicians</li> </ul>
Train the concerned pupils and again teachers.	Use the end of the school year for this. If possible with their own devices.
<b>The project is starting</b>	
Provide support for teachers (hardware & software)	<p>The IT Team is responsible for providing support:</p> <ul style="list-style-type: none"> <li>• First level (basic skills)</li> <li>• Second level</li> </ul>
Evaluate the project concerning the aims	<ul style="list-style-type: none"> <li>• Ask teachers, pupils and parents</li> <li>• Use SELFIE</li> </ul>
Readjust the project on base of the results	

## Annex 2

### Draft Project Plan ES Munich Project Plan "Media Education at the ESM"

*Draft of 27.11.2019*

#### 1) Starting point: Effects of digital media on professional learning, on cross-curricular competences and learning motivation

Important results on the effects of digital media on learning, mainly gained from metastudies, can be found in the short report "Effects of digital media on the acquisition of knowledge and skills in schools" by the authors Prof. Frank Fischer, Christof Wecker and Karsten Stegmann (LMU Munich, Chair of Empirical Education and Educational Psychology) of October 2015.

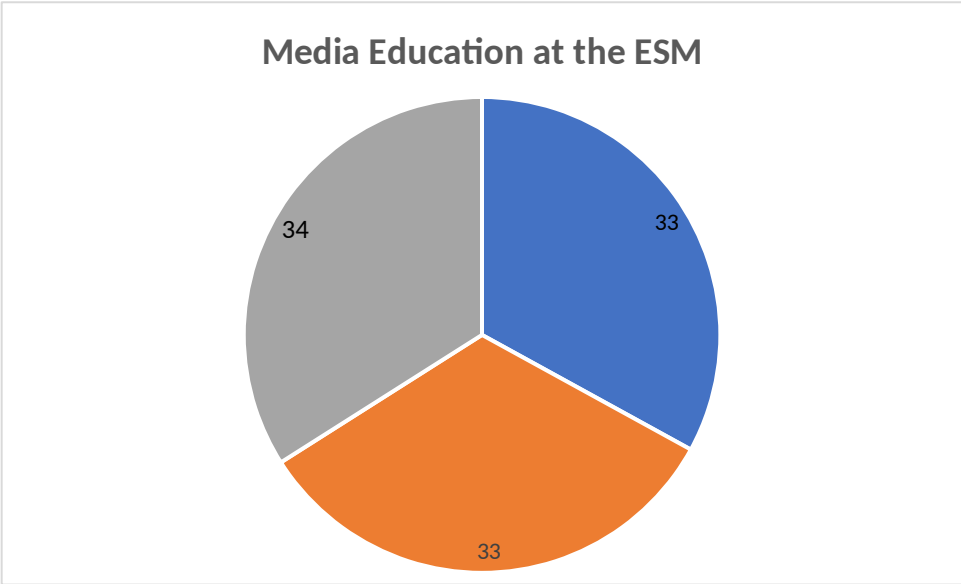
The most important ones for us can be summarized as listed below:

- **Basically:** Digital media have a verifiable positive effect on average, but in comparison to other measures (such as tutoring programs) they have a rather small positive effect.
- **Optimization of effects:** The effects are all the stronger the more strongly the media used stimulate cognitively active (e.g. taking notes) and constructive (e.g. arguing) activity on the part of learners. For example, the effects of digital presentations are low, those of creating term networks with concept mapping applications the strongest. The effects are more pronounced if the learning success criteria are not based on factual knowledge, but on more demanding measures such as the development and representation of one's own position.
- **Intensity of use:** In math lessons, the best effects are achieved at a medium level (30-75 min/week). For reading comprehension, on the other hand, a high intensity (more than 75 min/week) proves to be most favourable.
- **Type of use:** The effects are greater for digital media that are linked to and support teaching than for technologies that provide independent instruction independent of teaching.
- **Effects on students:** boys and girls benefit equally from the use of digital media, as do generally pupils with low, medium and high cognitive abilities. For reading comprehension, there are indications that lower and medium gifted learners benefit more from the use of digital media than higher gifted learners.

- **Effects in the individual subjects:** Between the subjects studied, the effects vary to a limited extent in the area of small effects. An exception is spelling promotion, for which significantly greater effects could be demonstrated.
- **Promotion of reading and writing skills:** Computer-based tutors achieve low positive effects in this area, which are significantly weaker compared to tutoring by older pupils. The use of word processing software leads to longer and better-quality texts compared to paper and pen.
- **Effects of use on other cognitive abilities:** Positive effects can be found above all in the promotion of problem-solving competence.
- **Effects on the competence to cooperate:** Unstructured cooperative learning also leads to sub-optimal learning outcomes with digital media. The effects of cooperative learning on cooperation competences (e.g. argumentation competence) are, however, of significant magnitude if, in the case of cooperation, additional graduated aids are available which support the learners in their cooperation and, in particular, in picking up on and further developing the contributions of the learning partners.

**Conclusion:** The positive effects of using digital media are rather small compared to other measures. In order to achieve a positive return on investment, the focus must be on pedagogical aims. Therefore, **the starting point of the project must be pedagogy, not technology.**

## 2) Project aims



<b>Aim 1:</b> Creation of an action plan "Digital Competence"	sectors: <ol style="list-style-type: none"> <li>1. Technology &amp; devices</li> <li>2. In-service training</li> <li>3. Subject-specific objectives (based on the curricula)</li> </ol>	School year 2019/2020
<b>Aim 2:</b> Implementation I	"Roll-out" of: <ol style="list-style-type: none"> <li>1. BYOD in s5</li> <li>2. In-service training</li> <li>3. especially for teachers in s5</li> <li>4. Subject-specific objectives for s5</li> <li>5. First evaluation</li> </ol>	School year 2020/2021

	<p>Creation:</p> <p>Subject-specific objectives for s4, s6 and s7</p>	
<b>Aim 2: Implementation II</b>	<p>“Roll-out” of:</p> <ol style="list-style-type: none"> <li>1. BYOD in s4, s5 and s6</li> <li>2. In-service training</li> <li>3. Second evaluation</li> </ol> <p>Creation:</p> <p>Subject-specific objectives for s1-3</p>	School year 2021/2022

### 3) Project organisation

**Project management**

Kieran Kiely (IE), Thomas Riser (AT)

**Media Curriculum, policies and subject specific objectives**

Christophe Conot (FR), Steven Ash (GB)

**Training and professional development**

Andrew Lyons (GB), Benjamin Feiler (DE)

**Survey and evaluation**

Robert Cobelens (NL)

<b>4) Project plan: steps</b>
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## Aim: Creation of an Action Plan "Digital Competence"

### 1. Team building

- Determine members / structure
- Clarify distribution of tasks
- Inform the college and boards
- Allocation of budget (remuneration etc.)
- Create overall project plan with schedule
- Plan team meetings (also together with Primary school)

### 2. Carry out an inventory

- "Learning with and about media"
  - Use of media in teaching: analyse statistics (survey Brussels), if necessary create, carry out and evaluate own survey
  - Analyse curricula and guidelines
- "The College's training needs."
  - Clarify procedures (external/internal training, dates,...)
  - Prepare, execute and evaluate survey
- "Media Equipment and Organization"
  - "ICT Report for 2018" (2019-02-D-17-en-3)
  - Equipment with licenses and hardware
  - Utilization of computer rooms and iPads
  - Integration of the media library
  - Analysis of responsibilities
  - Obtain feedback on usability if necessary: Prepare, execute, evaluate survey
- Documentation of the central results in the action plan

### Clarify project objectives

- Collect and formulate pedagogical, educational, organisational and technical equipment goals.



- Inform the college, student and parent representatives about the goals, discuss them and obtain their consent.
- Finalize goals
- Define indicators for the achievement of objectives and evaluation instruments
- Document and communicate goals in the Action Plan
- Define timeframes and responsibilities for each objective

### **3. Plan actions**

- Plan actions to achieve individual goals - Areas:
  - specific plans for all subjects (also: media education – cybermobbing, data protection,...; clarify the role of the media library)
  - organise structured training courses
  - efficient distribution of equipment (especially with a view to the transition between Primary and Secondary school)
- Determine the timeframe and the persons responsible for the individual measures
- Dividing measures into work steps
- Documenting actions in the Action Plan

### **4. Implement actions**

- Introduction of the Action Plan
- Start of the implementation of the training program
- Review of implementation

### **5. Self-evaluation of the effectiveness of the actions implemented**

- Prepare evaluation instruments
- Perform and interpret evaluation
- Record results of Action Plan evaluation
- Making the results available

## Annex 3

### Bring Your Own Device Policy – Example



EUROPEAN SCHOOLS

The following policy is presented under the supervision of the legal assistant of the Office of the Secretary-General of the European Schools. It is an example to be adapted by each school.

#### **FOREWORD**

The European School ..... strives to offer its pupils the best conditions for learning and working with digital equipment. To support this effort, the strategy calls for permitting pupils to use personal devices (of their own and of their choice) for school-related activities by connecting them to the School's network.

Pursuing this educational goal requires adopting a "Bring-Your-Own-Device Policy" (hereafter "BYODP") to clarify what may or may not be considered as an acceptable use. The present BYODP outlines the rules for the proper use of personal devices from an ethical and legal point of view. It is also meant to protect the security and integrity of the School's data and technology infrastructure.

This policy constitutes an annexe to the internal rules of the School and is part of the binding regulatory framework to which students are subject. For it, the term "device" refers to a mobile digital device (tablet or laptop computer) which can be connected to the School's Wi-Fi.

## **ACCESS TO THE SCHOOL'S NETWORK**

Students may access the School's network for pedagogical purposes only. It entails having access to:

- both shared and personal data storage on the School's servers Network software;
- Office365 (including the e-mail service) managed by the European Schools;
- proprietary or open-source software;
- Internet and Wi-Fi.

Accessing the School's network is a privilege, not a right. The School reserves the right to revoke this privilege if students do not abide by the rules outlined in the present policy.

Access codes are granted by and under the supervision of a member of the educational team.

## **CONFIDENTIALITY**

Access to network accounts are personal and individual, and may not be shared.

Access codes are confidential, and may not be divulged to third parties, except for the student's legal representatives. Students must report any problem they would encounter with their account to their education counsellor.

As regards confidentiality, the following will be regarded as a breach of the present policy (it being understood that the list is not exhaustive):

- trying to find out another person's password;
- logging in with another person's username and password;
- opening, editing, or deleting the files belonging to another person and/or generally trying to access another person's account;

## **ACCEPTABLE USE POLICY**

Each student is personally responsible for his/her actions in accessing and using a device on the School's network. Failure to comply with the rules for acceptable use will result in disciplinary action, which may also include suspension of computer privileges, resulting in a failing grade for work requiring the device in class.

The School defines acceptable use of personal devices as school-related activities in connection with the mission of the European Schools. Students are blocked from accessing certain websites<sup>44</sup> during school hours/while connected to the School's network at the discretion of the School and are not authorised to connect to chat services, discussion forums, or social networks without the express permission of a member of the educational staff.

Devices may not be used at any time to illegal or harmful purposes.

The following list, though not covering every situation, specifies some of the conduct that violates the acceptable use of the device:

- intentional damage to hardware or software, or the creation or distribution of viruses, worms or other forms of digital mayhem;
- creating, displaying or transmitting threatening, racist, sexist, pornographic, negationist, abusive or harassing language or materials;
- storing or transmitting illicit materials;

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<sup>44</sup> Forbidden websites include, but are not limited to... The following apps are/are not allowed: ...

- unauthorised use of a computer account or distribution of a password;
- plagiarism or intruding into other people's files;
- using electronic mail to harass or threaten others, including sending repeated, unwanted e-mails to another user. This is in line with the School's anti-bullying policy;
- using e-mail lists or personal information for purposes other than those that are pedagogical or educational in nature;
- giving your name, address, or phone number to anyone over the Internet<sup>45</sup>;
- downloading and/or installing any software including, but not limited to, executable files, games, MP3 files or players, video files, zip files, where these are not authorized by a teacher;
- viewing a website which was not approved by your teacher or viewing a website not in line with instructions for your work during class.

## **DEVICES AND SUPPORT**

Smartphones (multifunction mobile phones) are allowed (the list should be as detailed as necessary including models, operating systems, versions, etc.).

Tablets are allowed (the list should be as detailed as necessary including models, operating systems, versions, etc.).

Connectivity issues will be supported by ....

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<sup>45</sup> Under no circumstances should the pupil give out his/her full name, photo, address, telephone number, or any other indicator facilitating his/her identification on the Internet.

Devices' camera and/or video capabilities must be disabled while on-site, except in the case of a request from teachers in the pedagogical framework.

## **SECURITY**

In order to prevent unauthorised access, devices must be password protected using the features of the device. A strong password is required to access the School's network. The School's password policy is: (e.g. passwords must be at least six characters and a combination of upper- and lower-case letters, numbers and symbols...).

As regards security, the following is strictly prohibited policy (it being understood that the list is not exhaustive):

- installing software or making a copy of software present on the network;
- deliberately disrupting network operation, including the use of programs to circumvent security or introduce malware (viruses, spyware or others);
- diverting or attempt to bypass protection systems in place (firewalls, antivirus...);
- using VPN<sup>46</sup>.

## **RISKS AND LIABILITIES**

Students maintain complete responsibility for their device. As stipulated in Article 34 of the General Rules of the European Schools: *“The school shall not be responsible for objects brought to school by pupils”*.

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<sup>46</sup> In computing, a Virtual Private Network, abbreviated VPN – Virtual Private Network, is a system for creating a direct link between remote computers, isolating this traffic in a kind of tunnel.

While the School will take every precaution to prevent the student's personal data from being lost, it is the student's responsibility to take additional precautions, such as backing up email, contacts, etc.

The School reserves the right to disconnect devices or disable services without notification.

Lost or stolen devices must be reported to the School within 24 hours. Students are responsible for notifying their mobile carrier immediately upon loss of a device.

Students are liable for all costs associated with their device.

Students assume full liability for risks including, but not limited to, the partial or complete loss of personal data due to an operating system crash, errors, bugs, viruses, malware, and/or other software or hardware failures, or programming errors that render the device unusable.

The School reserves the right to take appropriate disciplinary action up to and including definitive exclusion for noncompliance with this policy.

## **PENALTIES**

Any student who violates the present policy will be subject to disciplinary proceedings as per the General Rules of the European Schools and the internal rules of the School, as well as penalties and criminal proceedings prescribed by law. Teaching staff will exercise strict control in order to ensure respect of the rules by the students they are responsible for.

The network administrator must ensure the proper working order and use of the School's technology infrastructure. To this end, the monitoring makes it possible to detect anomalies (excessive use of the network, excessive storage space, attempted cyber-attack, etc.). In the event anomalies are detected, the IT administrator will ask the School's management to agree on the measures to be taken. But in case of absolute urgency, and to protect the computer system of the Schools, the IT administrator may make the decision to immediately block accounts for one or more students, then immediately inform management.

This type of intervention can only be carried out for clearly defined purposes, namely:

- the prevention of unlawful or defamatory acts, acts contrary to morality, or likely to undermine the dignity of others;
- the protection of the confidential, economic, or financial interests of schools, as well as the fight against those responsible for attempting any such unwarranted access;
- the security and/or proper working order of the IT systems, including the control of related costs, as well - as the physical protection of the school's facilities;
- ensuring respect for the principles and rules regarding the good faith use of available technologies.

## **PROTECTION OF PERSONAL DATA**

The School undertakes to process personal data collected in connection with the use of personal devices in strict compliance with the General Data Protection Regulation.

## **SIGNATURE**

The signature of this policy is mandatory for any student willing to connect a personal device to the School's network.

Name:

Signature:

Class:



## Annex 4

### Criteria for choosing mobile devices and related technologies

The choice of mobile devices is an essential point in the digital equipment of institutions and schools. Indeed, mobile equipment often comes with an ecosystem in which it is integrated: hardware management tool, software management tool, application acquisition process, information security and personal data protection. The hardware support and the different stages of preparation of a mobile device are also important points in the choice of equipment and associated services.

This chapter is intended for stakeholders involved in the acquisition of mobile devices or mobile classrooms (schools) or BYOD terminals (responsible for students or others) who will find recommendations to guide them in their choice<sup>47</sup>.

#### **Key words to indicate requirement levels**

The following chapters provide recommendations to help project leaders formulate their requirements for the choice of mobile equipment and the various services needed for the success of their project.

The remarks concerning “Hardware Features”, “Accessories” and “Security” are valid for all kind of mobile device projects. Those to “Mobile Device Management” and “Classroom management tool” are related only to projects for which a use of those has been decided – they are a possible add-on.

The requirement levels in the recommendations are expressed using specific words, based on the RFC 2119<sup>48</sup> terminology:

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<sup>47</sup> Main source used : French Ministry of Education (2018). CARMO - Cadre de référence CARMO version 3.0 [online] Available at: <https://eduscol.education.fr/cid137345/cadre-de-reference-carMO-version-3.0.html> [Accessed 24 January 2020].

<sup>48</sup> <https://www.ietf.org/rfc/rfc2119.txt>. The Internet Engineering Task Force (IETF) is an open standards organization, which develops and promotes voluntary Internet standards; Requests for comments (RFCs) are a numbered series of documents published by the IETF and describing the technical aspects and specifications of the Internet, or of different computer hardware.



1. **MUST**
2. SHOULD
3. MAY
4. SHOULD NOT
5. **MUST NOT or SHALL NOT**

Figure 1: Required level of recommendations

MUST <sup>49</sup>	the element is an <b>absolute requirement</b> of the specification
SHOULD	there may be valid reasons in particular circumstances for ignoring a particular element, but all <b>implications must be understood</b> and <b>carefully weighed</b> before choosing a different path
MAY <sup>50</sup>	the element is <b>truly optional</b>
SHOULD NOT <sup>51</sup>	there may be valid reasons in particular circumstances where a particular behaviour is acceptable or even useful, but <b>all implications should be understood, and the case carefully weighed</b> before implementing any behaviour described with this notation
MUST NOT <sup>52</sup>	the element is an <b>absolute prohibition</b> of the specification

Table 2: Signification of the level of recommendation

<sup>49</sup> Other terms: "REQUIRED" or "SHALL".

<sup>50</sup> Or the adjectives "OPTIONAL" or "RECOMMENDED".

<sup>51</sup> Or the phrase "NOT RECOMMENDED".

<sup>52</sup> Or "SHALL NOT".

## 1. Hardware Features

Mobile devices must comply with a set of characteristics and recommendations to ensure proper use in schools

Feature	Recommendation for mobile device	Reason
screen size	<b>SHOULD</b> be greater than 9 but to a maximum of 14 inches	A size smaller than 9 inches penalizes the possibilities of reading and producing content. A screen size bigger than 14 inches might be too big for the schoolbag and the table during lessons
resolution	<b>SHOULD</b> be min 1080p	To display documents, graphs, tables and text properly and to work on the device the resolution should be 1080p (FHD) or more. 720p (HD) is possible, but for proper work in Office it is too less.
weight	<b>SHOULD NOT</b> exceed 1.2 kg excluding accessories	For the same reasons as above.
connectivity	<b>MUST</b> have Wi-Fi, Bluetooth (minimum 3.0)	Students and teachers need to connect to the internet via the school's network and to wireless accessories (headphones, mouse...)
screen cast	<b>SHOULD</b> be able to wirelessly connect to a beamer or screen.	This encourages the sharing of students' work in the classroom and collaborative work.
battery life	<b>SHOULD</b> offer sufficient battery life for one school day.	The classrooms are not equipped to load all the students' mobile equipment. Note that during a normal school day, the device is not necessarily permanently switched on.  In case of a smaller device (< 10 inches) 30 Wh and in case of a bigger device 50 Wh are good.
storage	Available memory <b>SHOULD</b>	The mobile device also <b>MAY</b> be equipped with an external memory such as a micro SD card to

Feature	Recommendation for mobile device	Reason
	be at least 32 GB and <b>SHOULD</b> be a Flash Memory (SSD, EMMC...) <b>MAY</b> be equipped with an external memory.	expand its memory capacity. A spinning hard drive (HDD) is not so durable in a mobile device.
RAM	Tablets (Android, IOS) <b>SHOULD</b> have at least 2 GB of RAM. Laptops or convertibles (Windows, Linux, MAC OS, Chrome OS) <b>MUST</b> have at least 4GB	The device gets very slow when the RAM is fully used by the OS and the applications. For proper work enough RAM is very important.
camera	<b>SHOULD</b> have at least one camera	In order to make photos of documents or students' work and make small videos for learning reasons. The quality of the camera <b>SHOULD</b> be adapted to the use <sup>53</sup> .

## 2. Accessories

Feature	Recommendation for mobile device	Reason
protection	Protective cover or shell	To sustain the lifetime the device <b>SHOULD</b> be protected in some way to avoid damages on

<sup>53</sup>. For a videoconference, the use of lip-reading by the hearing-impaired depends on the quality of the image captured (as well as its transport over the network and its restitution according to the quality of the software and the screen).

Feature	Recommendation for mobile device	Reason
	<p><b>SHOULD</b> be associated with the MD (if it is not reinforced to limit damage).</p>	<p>screen and device.</p> <p>The protective cover <b>SHOULD</b> allow the mobile device to be placed in an upright or tilted position, not just flat, making it easier to view the media.</p>
keyboard	<p>A physical keyboard <b>SHOULD</b> be associated with the MD</p>	<p>Tablets all have virtual keyboards, which are not suitable for mass content production, especially in Secondary. Thus, a physical keyboard compatible with the mobile equipment <b>SHOULD</b> be associated with the mobile equipment.</p> <p>However, the virtual keyboard has the advantage of being able to adapt to the context of use of the device (e.g. various languages) and offers a solution to the problem of specific characters.</p>
accessories	<p><b>MAY</b> be associated with the mobile device, but <b>MUST</b> be adapted so as not to interfere with its use</p>	<p>Mobile equipment must be able to respond to many situations and allow a variety of uses. Accessories <b>MAY</b> be associated with the mobile device (e.g. pointing pen, fine-tip stylus for writing with the hand, technical probes, etc.), depending on the educational uses expected in the school or establishment, or special needs (e.g. disability compensation).</p> <p>Several subjects or situations (modern languages, music education, school outings, podcasting, certain cases of visual impairment) require the use of headphones or earphones.</p> <p>The accessories selected to complement the mobile equipment <b>MUST</b> be adapted so as not to degrade its use. For example, make sure that the protective cover does not obstruct the camera, microphone, speakers, plugs, buttons...</p>

### 3. Mobile Device Management (MDM)

Deployed mobile devices <b>MUST</b> be able to be registered using the MDM function.
The MDM function <b>SHOULD</b> be able to control access to the parameterization of the mobile devices.
The MDM function <b>SHOULD</b> make it possible to forbid access to certain applications (e.g. the store).
The MDM function <b>SHOULD</b> be able to send notifications to mobile devices.
The MDM function <b>MUST</b> be able to propose the creation of groups of mobile devices for differentiated uses.
The MDM function <b>MUST</b> be able to control how mobile devices are secured.
Operating systems (ROM) in use on mobile devices <b>MUST</b> be monitored.
The update of operating system security patches <b>MUST NOT</b> be automatic.
An administrative security function <b>MAY</b> be proposed to block a mobile device
The MDM function <b>MUST</b> be able to audit mobile devices. The project <b>MUST</b> specify the precise functionalities that are expected.
Administrators of the MDM feature <b>MAY</b> use its functionality to perform security-related operations on mobile devices
The MDM function <b>MUST</b> be able to keep pace with updates to the operating systems of mobile devices.
The MDM function <b>MUST</b> provide support in English
Access to MDM functionality and data <b>MUST</b> be secured in accordance with data protection and security recommendations.
The implementation of the MDM function <b>MUST NOT</b> result in the blocking of applications or configurations intended for students with disabilities.
Mobile device / MDM compatibility <b>MUST</b> be verified in order to benefit from the full functionality of MDM, in particular the version of the operating system or the manufacturer's customizations.
The MAC address <b>SHOULD NOT</b> be used by the MDM function as the unique identifier of the mobile equipment (risk of spoofing).
The data controller (director of a school) <b>MUST</b> ensure that the data processing implemented is carried out in compliance with the provisions of the GDPR.
The MDM function <b>MUST</b> be able to interface with the identity repository in compliance with data protection provisions and in particular with the

principles of purpose, proportionality and minimisation.
The MDM function <b>MUST</b> be able to manage all the mobile devices within its perimeter.
The MDM function <b>MUST</b> be able to partition the management of mobile equipment by organisational structure in a totally sealed manner.
A service and maintenance range <b>MUST</b> be defined.
The expected availability during the service range <b>MUST</b> be defined.
The technical solution chosen for the MDM function <b>MUST</b> be in line with the deployment strategy and therefore be scalable in order to predict the load.
The technical solution for the MDM function, if selected by the OSGES, <b>MUST</b> allow for the delegation of roles to schools.
The MDM function <b>MUST</b> be able to interact technically with its partners in compliance with data protection provisions and in particular with the principles of purpose, proportionality and data minimisation.
The MDM function <b>MUST</b> be able to automatically collect information from the identity repository or <b>MUST</b> be updated by replication.
The MDM function <b>SHOULD</b> be able to make the necessary information available to the service provider responsible for preparing the mobile device.

Table 3: Summary of Recommendations - Mobile Device Management (MDM)

## 4. Security

Those involved in a mobile device deployment project <b>MUST</b> implement the appropriate technical and organisational measures to ensure a level of security appropriate to the risk.
Protection mechanisms (filtering...) <b>MUST</b> be put in place in the school setting (outside this framework, it is up to the legal authorities to ensure the control of these accesses).
Security objectives for mobile devices <b>MUST</b> be integrated into the school' s IT security policy.
The WPS (Wi-Fi Protected Setup) function of access points <b>MUST</b> always be disabled.
Wi-Fi network code <b>MUST NOT</b> be disclosed
User installation of an alternative operating system (ROM) <b>SHOULD</b> be prohibited except for projects without BYOD equipment pool management
Operating systems (ROM) being deployed <b>MUST</b> be monitored from the MDM function including for projects using BYOD fleet management
A random check of mobile devices <b>SHOULD</b> be set up.
The publisher <b>MUST</b> specify the hardware prerequisites (and other incompatibilities) of its resources.
The school <b>MUST</b> define the minimum set of applications (involving teachers).
Equipment <b>MUST</b> be selected according to planned resources
The selected resources <b>MUST</b> be supported by the hardware.
The masters <b>MUST</b> be compatible with the device (power required and total space occupied on the mobile equipment).
The image (applications + data + configuration) of the mobile equipment (with the exception of BYOD equipment not managed by a fleet management tool/MDM) <b>MUST</b> be backed up to restore an identical mobile equipment (restoration)
The data in the pedagogical area <b>MUST</b> be saved securely and in compliance with the legal and regulatory provisions in force.
The data in the private area <b>MUST NOT</b> be saved (the charter will mention this exclusion).
The mobile device <b>SHOULD</b> be able to be geolocated, in compliance with legal and regulatory provisions, following an official declaration of loss or theft made by the legal authorities and in the case of a judicial requisition.
Notifications <b>MAY</b> be sent on lost or stolen mobile devices



The mobile device <b>MUST</b> be able to be blocked remotely. This also applies to projects using BYOD equipment fleet management.
The configuration data (account, Wi Fi...) <b>MAY</b> be deleted remotely.
The operating system of the mobile device <b>MUST</b> be kept up to date with safety patches at all times.
Solutions for the analysis of resource usage, network traffic... <b>MAY</b> be implemented in compliance with legal and regulatory obligations.
An antivirus <b>SHOULD</b> be installed on the mobile device during the preparation phase.
The geolocation feature of the mobile device <b>MUST</b> appear visibly when activated and its activation <b>MUST</b> have the consent of the user.
Any access by an application to the user's contact list <b>MUST</b> obtain the user's consent.
The individual mobile device <b>SHOULD</b> be equipped with a parental control tool with a default setting. The access code for the setting is provided to the parents.
The individual mobile device <b>MUST</b> include a pedagogical space
The individual mobile device <b>SHOULD</b> include a private space for private data
Personal space <b>MUST</b> be defined (e.g. location, boundaries) and unambiguously named (e.g. PERSONAL). Irreversible data erasure processes <b>MUST</b> be provided for each case of use (change of user, end of the planned data retention period, etc.). Personal data stored in the Cloud <b>MUST</b> be located in the European Union.
Access to a user's personal space <b>MUST</b> be reserved for him/her to the exclusion of any other person. Without possession of the user's means of authentication, the data <b>MUST NOT</b> be able to be consulted / modified. In particular, the technical administrators of the storage spaces manage the capacity of the spaces but <b>MUST NOT</b> access the content of the personal space (clearly identified as such) without the agreement of the user or a judicial authority.
Without possession of the means of authentication of the user the data <b>MUST NOT</b> be able to be consulted/modified.
An alert threshold <b>SHOULD</b> be set to warn the user. One threshold per space (pedagogical and private) <b>MAY</b> be defined
Productions <b>SHOULD</b> be able to be deleted remotely
The MDM solution <b>SHOULD</b> be able to offer the user the possibility to delete their personal data.
Re-installation of the operating system by a user <b>SHOULD</b> be prevented.
Access to application installation systems by profile (teacher versus student) <b>MUST</b> be controlled.

The local administrator of the institution or school <b>MUST</b> be able to update the private store with the applications purchased by the institution or school (when the devices are enrolled using an MDM).
Students and teachers <b>MUST</b> be able to install, uninstall or update an application from a private store.
The MAM function <b>SHOULD</b> be used to deny access to certain applications (e.g. store).
The MDM solution <b>SHOULD</b> be able to control access to the configuration of mobile devices, including for projects using BYOD equipment fleet management.
The mobile application distribution solution <b>MUST</b> offer a reliable and responsive service
The prerequisites concerning the infrastructure services for the school <b>MUST</b> be put in place in compliance with legal and regulatory provisions.
Access to the mobile device <b>MUST</b> be secured by a password in accordance with the data protection and security recommendations.
A device lock with a secure standby mode after a few minutes of inactivity <b>MUST</b> be proposed.
The individual mobile device (excluding BYOD terminals) <b>SHOULD</b> be protected by the login/password of the online workplace account.
Access to applications with sensitive or confidential personal data <b>SHOULD</b> be secure.
Applications that can be downloaded to the mobile device <b>MUST</b> respect the principle of requesting prior authorization from the user before accessing their files.
The conventional device <b>MUST</b> specify to users the conditions of use of the mobile device
A charter of use <b>MUST</b> be put in place and shared.
Application editors <b>MAY</b> propose applications respecting an SSO mechanism.
Only the information necessary for the operation of the MDM or class management solution <b>MUST</b> be used. The legal principles of proportionality, finality and minimization <b>MUST</b> be respected.
MDM / class management solutions <b>MUST</b> provide secure mechanisms (protocols and exchange formats) for integration with external directories; often LDAP or Active Directory is used.
Fleet management solutions (MDM and/or asset management) and class management services <b>MAY</b> be populated from pre-existing identity repositories but <b>MUST</b> only include the data strictly necessary for their functions.

Table 4: Summary of Recommendations – Security



## 5. Classroom management tool

The teacher <b>SHOULD</b> be able to disseminate a resource to students in his or her class.
The teacher <b>MUST</b> be able to authorize, restrict or temporarily block students' access to the Internet, depending on the pedagogical objectives of the sequence.
The teacher <b>SHOULD</b> be able to view the students' screen on his/her workstation or mobile device. This is to monitor the progress of the work, to identify students who need help, and to identify students who need to be supported.
The teacher <b>SHOULD</b> be able to display the screen of his/her workstation or mobile device on the screen of his/her students' mobile devices.
The teacher <b>SHOULD</b> be able to remotely lock students' mobile devices to avoid distractions when the mobile device is not in use in class.
The teacher <b>MUST</b> be able to allow or block certain applications, for a particular piece of work, or during a test.
The teacher <b>SHOULD</b> be able to consult the list of mobile devices in the classroom and their status (battery, connectivity) to ensure their availability for all students.
The teacher <b>MAY</b> create anonymous or pseudonymous surveys and view the results.
The teacher <b>SHOULD</b> be able to create virtual groups.
The teacher <b>MAY</b> block or allow copying of data to or from a device such as an SD card or USB stick.
The teacher <b>MAY</b> allow a student to display what he or she is doing on the screen of other mobile device in the class or group.
The teacher <b>MAY</b> play an audio or video file simultaneously to all students or to a group.
The teacher <b>SHOULD</b> be able to darken the screen of the students' mobile devices
Teacher <b>MAY</b> set up discussion sessions
The teacher <b>SHOULD</b> be able to use the microphone to talk to a student or group.
The teacher <b>SHOULD</b> be able to listen to what a student is saying into the microphone.
The teacher <b>SHOULD</b> be able, in a simple way, to provide recordable written comments on the student interface of the mobile device.
The teacher <b>MUST</b> be able to easily collect student work (audio, video or document).

Classroom management functionalities <b>MUST NOT</b> be used for the purpose of measuring student activity or cognitive abilities outside of an experimental and contractual framework where the solution's subcontractors commit to hosting and exploiting the data for educational pedagogical purposes (data enhancement)
The digital workplace and the individual mobile device <b>SHOULD</b> share a storage space which <b>MUST</b> be associated to the user's profile as soon as he is authenticated.
The controller (school principal) <b>MUST</b> ensure that the data processing operations implemented are carried out in accordance with the provisions of the GDPR.
The functionality of the classroom management solution <b>MUST</b> be easy to use and effective.
The class management solution <b>SHOULD</b> also integrate other connected equipment (e.g. projector, interactive whiteboard).
Teachers <b>MUST</b> have been trained (course or self-training) in the use of the tools.
In particular, in compliance with the principles of purpose, proportionality and data minimisation defined by the GDPR, the class management solution <b>MUST</b> be able to integrate with the identity repository or the repository used by the MDM solution.

*Tableau 4: Summary of Recommendations - Classroom Management Tools*

## 6. Mobile classrooms

The configuration of rooms and buildings <b>MUST</b> be considered when selecting the container in order to ensure the movement required for the intended use.
The container <b>MUST</b> have an electrical recharging device for mobile equipment.
If this electrical recharging device requires the mobile equipment to be connected to the container via cables, the cables <b>MUST</b> be of sufficient, but not excessive size.
The container <b>MUST</b> be capable of being connected to electricity and the mains even when closed and secured.
The container <b>MUST</b> be adequately equipped to store external cables when moving.
The storage volume of the container <b>MUST</b> consider the volume of available accessories.
For use in mobile classrooms, an accessory <b>SHOULD</b> allow two helmets to be connected to the same mobile equipment at the same time.
If the establishment is not equipped with a permanent Wi-Fi, the mobile class <b>MUST</b> be equipped with a Wi-Fi terminal to relay the network (accessible from an RJ45 socket).
The Wi-Fi hotspot used with a mobile classroom <b>MUST</b> be easily activated or deactivated by the teacher (e.g. via a switch).
In the case where the school is not equipped with a sedentary Wi-Fi, a second removable terminal <b>CAN</b> be added to the device
Hardware and applications available as part of a mobile class <b>SHOULD</b> be managed via MDM solutions.
Deployment of updates and applications <b>SHOULD</b> be scheduled outside the range of use of the mobile class terminals.
Teacher <b>SHOULD</b> have dedicated device
The controller (school principal) <b>MUST</b> ensure that the data processing operations implemented are carried out in accordance with the provisions of the GDPR.
If the use of the terminals in an extracurricular context is envisaged, a charter co-written by the school principal and the head of the animation team <b>SHOULD</b> be put in place.
The storage location of the mobile class <b>MUST</b> allow electrical connection and access to the network.
Users of a mobile classroom <b>MUST</b> have a secure storage space external to the terminal to store the students' productions and retrieve them at each

session.

Table 5: Summary of recommendations - Mobile classroom