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# Technologies and Infrastructure

# Context

The main objective of the Strategic Partnership EICON is to **support organizations / institutions providing vocational education and training (VET) to become more inclusive using information and communication technology (ICT)**. Organizations / institutions that are active in VET are particularly in need for guidance on how to further develop, as they often have to work towards multiple aims simultaneously, i.e. inclusion usually is one among many other aims. **EICON particularly explores the inherent potential and synergies in the overlapping section between education, inclusion and digitalisation.**

EICON (Enhancing inclusion capacity of educational organizations / institutions providing VET with information and communication technologies (ICT)) is an ERASMUS+ KA2 Strategic Partnership for vocational education and training during 2018 - 2020 (Grant Agreement No.2018-1-DE02-KA202-005110). This list of inclusion opportunities has been developed in the context of EICON. It represents the results of discussions among the experts involved in the project as well as a subsequent public consultation process that involved a wider audience in reviewing the intermediate results.

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# How to use this list of inclusion opportunities?

There is no 'one best way' for any organization / institution active in VET to increase its inclusive capacity with ICT. Rather, each organization / institution needs to find its own solution that then fits perfectly to its respective situation and requirements. Therefore, this list of inclusion opportunities aims to guide organizations / institutions through a process of reflection and planning. List entries contain both examples of good practice and innovative examples and focus specifically on inclusion potential in an organisation.

Lists of opportunities may be used by different groups: **teachers**, **managers** of VET institutions / organizations and **facilitators** that support these organisations in organizational change processes. These lists have a slightly different focus depending on the respective role, so make sure you select the ones that fit to your role. Teachers use them, for example, to formulate requirements for their management with regard to the procurement of new ICT. Facilitators in turn can use the lists to discuss and decide on possibilities for specific ICT change projects together with the organisation's representatives. Managers can also use the lists to identify potential uses of ICT for inclusive leadership.

**Technologies and Infrastructure**

It is assumed, that most organisations offering vocational education and training find themselves in one of the following situations:

1. Information and Communication Technologies (ICT) are provided or largely **prescribed by external policies**, or the infrastructure is not considered an area to be changed (*see section 1 below*)
2. Information and Communication Technologies can be **freely chosen**, and infrastructure is **configurable**, to tailor both to the organisation and its (inclusion) requirements (*see section 2 below*)

The two options represent different levels of freedom for decisions and changes. Hence, different implications of either prescribed or open to choose technologies and infrastructure need to be reviewed. In reality, an organisation might neither fit 100% into the one or into the other category; rather it will be a mixture of conditions. It is therefore recommended to go through both sections of guiding questions and skip those questions that are not relevant for your specific situation.

# Section 1: Making best use of given technologies or infrastructure

In situations where technologies are provided or prescribed by external policies (i.e. policies that neither can be influenced nor ignored by an educational organisation), or where the infrastructure is not seen as something that needs to be adjusted to the specific requirements of an educational organisation, it is essential to find out about the **impact of the prescribed technology configuration on the organisation’s inclusive capacity**.

**The following questions may be useful to reflect on the potential or already observable impact of such policies:**

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| 🞐 Which external policies on ICT or infrastructure (may) create inclusion barriers (e.g. for specific target groups) or reduce an organisation’s inclusive capacity? (For example, locked computer rooms, no open Wi-Fi, use of mobile phones forbidden in educational organisation) |
| 🞐 Are there any alternatives left to your organisation to compensate potential negative implications of external policies on the organisation’s inclusive capacity? |
| 🞐 Are there enough solutions available for the technical platform prescribed by external policies that support inclusion? |
| 🞐 Are there options for additional non-standard, specialised solutions / approaches where the standard (prescribed by external policies) does not suffice?(For example, learners with autism who often do not communicate with others have been observed in communicating with humanoid robots without problems) |
| 🞐 Are there alternatives to school-owned ICT and / or infrastructure, e.g. making use of ICT or infrastructure provided (e.g. lent, sponsored, shared, made temporarily available) by others / third parties?(Some examples: * a virtual reality roadshow with simulators for different farming machines visits schools around the country, yet is owned and operated by a public authority;
* teachers bring their own devices to school and use them for teaching;
* private support / donations by parents, local businesses, stakeholders to buy ICT equipment.)
 |
| 🞐 Is staff sufficiently trained to use the inclusive potentials of the given technologies and infrastructure for all target groups? |

# Section 2: Selecting technologies and configuring infrastructure tailored to the organisation

In other cases, educational organisations will find themselves in the role to select specific technologies, and to adjust / configure established (or elsewhere tested) infrastructure solutions to their own needs and requirements. Availability of technologies and respective vendors who provide essential services (e.g. repair, replacement etc.) may vary depending on the location of the VET organisation. Yet, most probably a smaller set of alternative technologies, operating systems or infrastructure solutions would be shortlisted. What would then be the selection and configuration criteria if the aim is to raise the organisation’s inclusive capacity?

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| Reflect on hardware or software that … |
| 🞐 supports initial steps in educational pathways because they are simple, easy, and more accessible?(in opposite to solutions that come with a wide range of functionality where only few would be used in the beginning and therefore might be overwhelming for novice users) |
| 🞐 is capable to “grow” (with regard to functionality and utility) with their users during their individual educational pathways? |
| 🞐 motivates learners to stay in education? |
| 🞐 provides new possibilities for expression for some of the learners? (e.g. software or hardware emphasizing expression or creativity) |
| 🞐 provides new options to show learners’ capabilities or (soft) skills to teachers and others? |
| 🞐 opens a new channel of communication that comes with an added value? |
| 🞐 provides new means of assessment? |
| 🞐 supports differentiated instruction design? |
| 🞐 allows to create a safe learning environment for teachers to train specific situations in a classroom (e.g. via virtual reality applications) |
| 🞐 compensates shortcomings / barriers / inaccessibilities in the built environment, transportation, teaching or training materials? |
| 🞐 simulates / replicates the corresponding technologies / infrastructures that students will be called upon to manage later in their professional careers? |
| Critically assess hardware or software to avoid ICT that … |
| 🞐 inhibits the development of competence? |
| 🞐 contradicts VET school culture and / or VET values? |
| 🞐 contradicts the aims and objectives of the organisation?(for example software that does not allow learners to explain their own communication needs to others and hence requires help of a third person for this task) |
| 🞐 can hardly be localised to the respective language and hence might exclude potential users / learners from making best use of it? |

Beyond the technologies and infrastructure to be acquired by the organisation, learners themselves often possess technologies that are essential to them. To make best use of it in the context of learning:

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| 🞐 Do teachers know well enough the students’ special needs and the software and hardware they individually use? |

In reality, focusing on inclusion-related considerations only does not suffice. Specifically budgetary limitations are also important and might lead to the need for finding **compromises between economic and pedagogic considerations**. The following areas point out some options with budget implications to be discussed. However, none of the options *per se* is positive or negative with regard to inclusion. But it is assumed that in the context of developing inclusion *capacity*, it is preferable to choose options that ensure rather stable budgetary foundations for the procurement and maintenance of ICT:

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| 🞐 Does your educational organisation need to own the devices learners use? (e.g. renting hardware; support / donations from parents, local businesses, other stakeholders) |
| 🞐 Do your learners may use their own devices for their learning (i.e., Bring Your Own Device – BYOD - approach)? |
| 🞐 Whenever there is a need for new software, does your organization check if it exists as open source? |
| 🞐 Which costs and dependencies come with the procurement of a commercial product for the specific purpose? |
| 🞐 Does a lump sum / one-time payment for software include future, potentially critical or essential updates? |
| 🞐 Which future budgetary implications need to be considered with licence fees or rental costs for ICT? |
| 🞐 Will donations or sponsoring provide sufficient means to buy, maintain and renew required ICT permanently? |
| 🞐 Are there any financial sources available / usable to provide a permanent (i.e. non-temporary) IT budget? |
| 🞐 Is it economically more efficient to (hire and) pay internal permanent IT staff or to use pay-per-service contracts or framework agreements with external IT consultancy / services? |
| 🞐 Instead of buying software with a licence for your whole school, are there alternatives to test different software and to buy the necessary software to a smaller number of students? |



Please help us to further improve these results by taking part in our short survey.