

SNBI

Schweizerisches Netzwerk für Bildungsinnovation
Swiss Educational Innovation Network

Designing effective ICT-solutions in education and VET

A guide to foster innovation in learning and teaching

This guide helps you to use ICT effectively as a means to support learning and teaching. It may help you in the development of a new ICT-solution or in the improvement of an existing one.

The guide is based on our experience from several hundred projects from across the worldⁱ and specifies several aspects of the “*Framework for effective decision making*”ⁱⁱ. Please let us know, if it is helpful for you. We also appreciate your ideas how to further improve it!

We wish you an inspiring engagement with this exciting topic, leading to solutions that help especially disadvantaged learners to acquire the necessary knowledge and skills to thrive in social and economic life. Do not hesitate to contact us if you have any questions or challenges you would like to discuss. We are happy to support anyone in this important mission.

November 2019, Urs Gröbriel and Christoph Pimmer

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1 Develop effective options

In the first step, **develop a rough idea** of how you could effectively address the learning needs and goals of your target group by drafting 2-3 possible solutions that can help learners to reach their goals.

1.1 Define the goals for the learners

In answering the following question, put yourself in the position of the learner.

- Which **learning demands** do your learners have?
- Which **learning goals** do you want to reach: What should learners know and be able to do? What kind of learning goals are adequate from a programme / organisation perspective?

1.2 Draft possible solutions

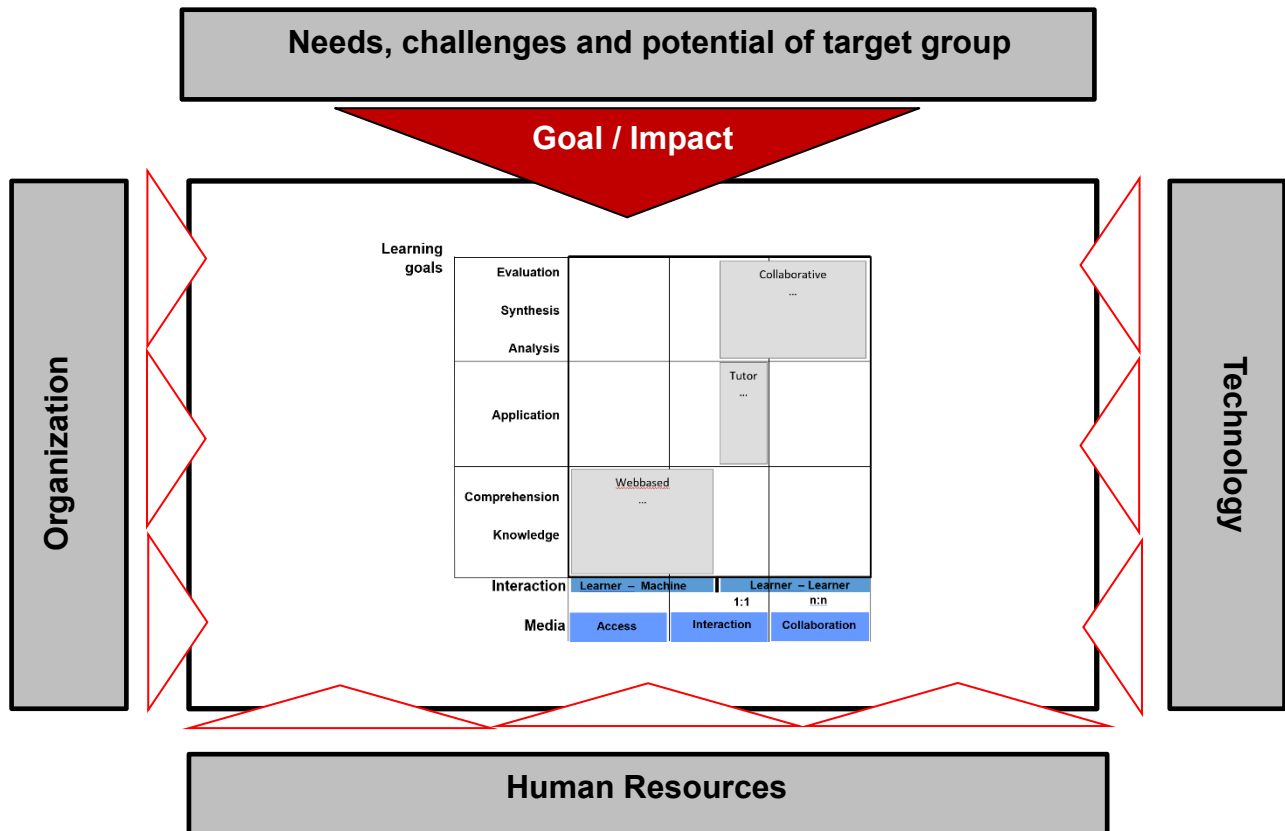
- Which **learning activities** are most appropriate to reach the learning goals?
- Which **digital tools and platforms** could enable and support these learning activities?
- Is there scientific **evidence on the use and effects** of the identified learning methods and tools?

The **E-Learning Landscape** can help you to discuss possible solutions in the team (illustration with 3 of many possible areas of ICT-support):

Learning goals	Evaluation			Collaborative ...
	Synthesis			
	Analysis			
	Application			Tutor ...
	Comprehension	Webbased ...		
	Knowledge			
	Interaction	Learner – Machine	Learner – Learner	
			1:1	n:n
	Media	Access	Interaction	Collaboration

2 Select and specify a sustainable scenario

In the second step, **analyze your context** to understand which of the possible solutions can be best implemented so that learning & teaching will be effective, efficient and sustainable – and identify the need for further development during the implementation of your solution.



2.1 Analyze needs, potential and strategic goals

Analyze which strategic goals of your organization have an influence on the choice of target groups, learning goals as well as technical and financial support of your project.

- What are the most important **needs, challenges and potentials** of your target group?
- Which **target groups, demands, needs** and what kind of **impact** are in your strategic focus?
- Which **strategic goals** of your organization relate to your project? (e.g. SDC Education Strategy, country strategy etc.)

2.2 Organization

- Do you need to align your solution with existing **curricula**? How does the solution and the content relate to curriculum reforms?
- Is digital content readily available that you can use and/or adapt? Who is responsible for quality assurance?
- Who are the relevant **stakeholders** and how do you need to involve them in implementing the solution? (e.g. Ministry of Education, local inspectorate, school management, teachers, parents)
- Do you have “**top-down support**” from relevant decision makers?



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- Are there **support units** that can be involved? To which extent can they contribute to your project? (e.g. teacher development, technical support, administrative support)
- What is the organizational culture of the organization? How has it dealt with innovation and changes in the past?
- With which NGO's, companies and government agencies can we partner?

2.3 Human Resources

Which prerequisites should the stakeholders meet for a successful implementation of the solution?

- What are the **attitudes and motivation** of teachers and other staff to implement and use the solution in their daily work? What are obstacles? Resistance and how can you address these?
- Which **skills** do they have in relation to the planned ICT-supported teaching activities? (Teaching and communication skills, media competencies etc.)
- Which attitudes, motivation and learning prerequisites do **learners** have with attention to the planned learning activities? Are they interested to use personal devices for learning and teaching?
- Is there a lack of expertise regarding some areas? Can this be addressed by buying in "**external**" **expertise**?

2.4 Technology

- What technological infrastructure is available in terms of **hardware, software, internet connection and power supply**?
- Is the technological infrastructure being **maintained and supported**? (s. also 2.2)
- Which devices do **students and teachers use personally** and how?
- To which software **standards and systems** do you need to adhere?
- What are expected **future developments** and regarding the technology you intend to use?
- Are there **other (also conventional) media** that are cheaper or better (fit for purpose) than ICT?

3 Describe your selected solution and prepare for implementation

In the third step, discuss and decide with the relevant stakeholders which of the possible solutions you want to implement and start with operative planning.

3.1 Situation

- Describe the target group, their immediate context, needs, challenges and potential (s. section 2.1).
- Describe the context factors that are most relevant for your target group and the development of your solution (2.2-2.4).
- Conclude with the main challenge that you intend to address and the potential you intend to draw on.

3.2 Goal

- Describe the overall objective and the specific learning goals and impact of your initiative, referring to strategic goals (2.1).
- Describe the learning need you intend to address and some exemplary learning goals.

3.3 Solution

- Describe the selected solution: expected activities of students and teachers, deployed media (1.2, matched with 2)
- Describe very briefly your theory of change. How will outputs and outcomes be achieved.

3.4 Implementation

- Describe the core team and the partners with their expertise (2.2 and 2.3).
- Describe project phases, activities and milestones: Address organizational, pedagogical and technical points regarding your theory of change (2.2-2.4)
- Estimate expected costs. Compare cost with alternative solutions (2.4)

The level of detail according to which these questions should be answered varies with the size of the project. Small and clearly confined interventions with only a few participants and standard software may not need to answer all these questions in great detail, whereas big-scale projects with higher levels of complexity need to plan ahead much more specifically. Tools and concepts that may complement this guide:

- SWOT analysis
- Strategic management
- Design of guiding principles and learning goals
- Different project management approaches (from “waterfall” to modern “Scrum”-approaches)
- Costing templates, comparison of cost.

ⁱ Related documentation: Gröhbiel, U., Fischer, M., Nissler, A. (2017). Bildungsinnovation – Proaktiver Umgang mit neuen Herausforderungen an Bildungsanbieter. In: Zimmerli W. Ch.: Innovation – die letzte Meile. Collegium Helveticum, Zürich.

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ⁱⁱ Joel Mitchell, David Hollow, Meaghan Brugha and John Patch: *Information Communication Technologies (ICT) and Education*. Jigsaw Consult. Prepared for the SDC, 2019