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IDEA

COMPETENCE FRAMEWORK

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TABLE OF CONTENTS

01
INTRODUCTION

MODULE 02
THE IDEA COMPETENCE MODEL

MODULE 03
PRINCIPLES FOR INCLUSIVE IMPLEMENTATION

MODULE 04
IDEA MAKER COMPETENCE PROFILE

MODULE 05
IDEA FACILITATOR COMPETENCE PROFILE

MODULE 06
PROGRESSION AND LEARNING OUTCOMES

MODULE 07
IMPLEMENTATION PATHWAY

MODULE 08
EXPLOITATION AND REPLICATION GUIDELINES

09
ANNEXES

10
REFERENCES

1 Introduction



1.1 THE IDEA PROJECT IN BRIEF

The European Pillar of Social Rights states that everyone has the right to quality and inclusive education. On the disability front, this issue is of great concern, as a gap still exists in EU law to ensure equal treatment of persons with disabilities outside the field of employment, such as social protection, healthcare, education (Strategy for the Rights of Persons with Disabilities 2021-2030). Measures to promote inclusive learning are also supported by European policies. The Communication on achieving the European Education Area by 2025 highlights the importance of ensuring that education systems at all levels comply with the UN Convention on the Rights of Persons with Disabilities (European Commission, 2020). Similarly, the Strategy for the Rights of Persons with Disabilities 2021–2030 emphasises the need to guarantee equal access to education and labour-market-oriented training at all levels (European Commission, 2021). In this context, inclusive creative education represents a valuable approach to recognising and supporting the personal development of persons with disabilities, while respecting their individual abilities and needs.

The UN Convention on the Rights of Persons with Disabilities explicitly recognises the importance of developing their talents and creativity to their fullest potential (United Nations, 2006). Providing accessible tools, appropriate support and opportunities for creative expression can help individuals develop and demonstrate these abilities.

Digital technologies can further enhance these opportunities by facilitating participation, accessibility and new forms of creative expression. However, creative educational activities dedicated to people with disabilities do not always go in the direction desired by European policies, as they are often delivered in a perspective of assistance and subordination of People with disabilities, misreading their real needs. People with disabilities need to develop competences useful for the job market such as those related to digital innovation and entrepreneurship. In order to address these needs, the project involved FabLabs, digital fabrication laboratories, fitted with digital—such as 3D printers, CNC machines, laser cutters—and non-digital equipment.

The aim of these spaces is to provide non-specialists with an access to sophisticated technologies, so that they can explore, learn and make (Mortara and Parisot, 2017). These spaces have for objective to help develop both hard (e.g. electronics, 3D modelling, 3D printing, robotics) and soft (creativity, design thinking, prototyping) engineering skills. Furthermore, they also serve as a business incubation environment and help develop entrepreneurial skills (Browder, Aldrich, Bradley, 2017, Fonda, Canessa, 2016, Mortara, Parisot, 2017, Stacey, 2014).

The project combines FabLabs and organisations active in the field of the education of adult people with disability in this way, we developed the skills of the main beneficiaries (People with disabilities) in the field of smart manufacturing, in order to create real digital artisans (makers), providing them with manual and digital skills, stimulating their creativity, job opportunities and social inclusion.

The combination between organisations working in the field of adult education for People with disabilities with FabLab can guarantee to experiment an innovative education methodology addressing the main needs in terms of social inclusion through creativity and digital tools. The objective of IDEA is to promote the empowerment and inclusion of people with physical disabilities, by creating a positive learn-ing environment reducing misperceptions on disability and promoting their autonomy. Thanks to the project, this target group will be allowed to access innovative educational activities to which they are usually excluded due to prejudices and/or accessibility conditions.

This objective will be pursued by the project through:

- **Key role of people with disabilities:** within the pilot experimentation beneficiaries will be able to test the acquired skills as digital makers, working within FabLabs (digital fabrication laboratories), workshops set up to inspire people to turn their ideas into new products and prototypes through advanced digital manufacturing technology. People with disabilities will be able to develop their prototype projects together with the Prototypes Catalogue (R2), showing their creative skills alongside professionals, overcoming stereotypes and difficulties, thus promoting their empowerment and inclusion.
- **Promotion of positive synergies** between services dedicated to people with disabilities, the world of education, entrepreneurship, culture and creativity
- **Training of people with disabilities as "Makers":** the beneficiaries will acquire new creative skills (in the field of graphics, design, modelling, social abilities and entrepreneurship) through specific training based on project-based learning.
- **Acquisition of skills for people with disabilities expendable in the labour market.**
- **Transnational** co-design activity involving people with disabilities (WP3).
- **Development of a competence framework (R3)**, aimed at mapping and validate the competencies and skills – also according to the DigComp 2.2, EntreComp and LifeComp frameworks- acquired thanks to the project.

1.2 FRAMEWORK PURPOSE

The IDEA Competence Framework translates the IDEA methodology and the evidence generated through the national pilots into a practical European reference model for inclusive digital making. It is designed to support organisations working with people with disabilities, adult education providers, FabLabs, non-formal learning centres, makers, professionals and policy stakeholders in planning, facilitating, assessing and replicating inclusive maker-based learning pathways. The Framework contributes to the project's objective of developing a replicable European model based on the competences needed for people with disabilities to become active digital makers.

The Framework builds on the IDEA Toolkit for Adult Educators, developed to provide educators and facilitators with the methodological foundations and practical resources needed to organise inclusive co-design and digital fabrication activities. Structured into nine modules, the Toolkit covers the main stages of the learning process, from identifying user needs and generating ideas to prototyping, validation and communication, while addressing accessibility, participation and inclusive facilitation. This methodology was subsequently applied and tested through pilot activities in Italy, Norway and Spain, where people with disabilities worked alongside educators, designers and FabLab professionals to identify real-life needs, develop ideas and create practical solutions using digital fabrication technologies

The resulting prototypes and their development processes are documented in the IDEA Prototype Catalogue, which provides concrete examples of inclusive co-design and practical experimentation. Building on these complementary results, the IDEA Competence Framework identifies and structures the competences involved in inclusive digital making, drawing on the findings of the pilot experimentation and the subsequent competence mapping. It defines learning outcomes, progression levels and assessment approaches, providing a common reference to support the implementation, evaluation and replication of the IDEA methodology in different educational and community settings.

1.3 KEY FINDINGS FROM THE PILOT

The IDEA Competence Framework builds on the results of the pilot experimentation conducted in Italy, Norway and Spain, which provided practical insights into the competences involved in inclusive design, co-creation and digital fabrication. The activities brought together people with disabilities, educators and FabLab professionals to explore real-life needs and develop practical solutions through collaborative learning processes. Although the national pilots were implemented in different contexts and adapted to participants' individual needs, several common findings emerged that informed the development of the IDEA Competence Framework.

CREATIVE AND PROBLEM-SOLVING COMPETENCES

The experimentation highlighted the importance of identifying everyday challenges, exploring alternative solutions and developing ideas through collaborative design activities. Participants had opportunities to contribute their experiences, preferences and creative suggestions throughout the process

DIGITAL AND TECHNICAL COMPETENCES

The activities introduced participants to digital design, modelling, fabrication and prototyping processes. The pilots demonstrated the importance of flexible approaches to technical learning, recognising that meaningful participation can involve both direct use of technologies and contributions to design decisions, testing and improvement.

ENTREPRENEURIAL COMPETENCES

The development of prototypes provided opportunities to explore initiative, decision-making, planning and value creation. Working on practical solutions encouraged consideration of their potential usefulness for individuals and communities.

PERSONAL AND SOCIAL COMPETENCES

Collaboration between participants, educators and technical professionals highlighted the relevance of communication, teamwork, confidence, adaptability and active participation in the learning process.

COMPETENCES FOR INCLUSIVE FACILITATION

The experimentation also highlighted the essential role of educators and FabLab professionals in adapting activities, providing accessible communication, supporting collaborative processes and ensuring that participants remained actively involved in decisions. Across the pilot experiences, several methodological considerations emerged, particularly the importance of starting from real-life needs, adapting learning activities to individual abilities, providing appropriate support and allowing opportunities for practical experimentation and feedback.

The experiences in the three countries provide concrete examples of how these competence areas were addressed in practice

In Italy, participants worked on assistive solutions addressing everyday challenges, including GRABBER, a tool designed to facilitate the use of utensils, and EASYPEN, an adaptable writing aid. The development of these prototypes involved identifying specific needs, exploring possible solutions and refining designs through feedback and testing. These activities provided opportunities to practise creative problem-solving, inclusive co-design and user-centred evaluation.
In Spain, participants engaged in collaborative ideation and hands-on prototyping activities at FabLab Universidad de Valladolid. Through the use of digital design and fabrication technologies, including 3D printing and laser cutting, they explored the process of transforming ideas into tangible products. These activities provided opportunities to develop digital and technical competences alongside creativity, communication and teamwork.

In Norway, participants explored solutions to everyday accessibility challenges through the development of prototypes such as JEWEL, designed to facilitate jewellery fastening, and WellHome, a 3D-printed room model with movable furniture to explore accessible spatial arrangements. The activities combined digital modelling, fabrication, practical testing and iterative improvements, providing opportunities to practise problem-solving, decision-making and collaborative design.

Across the pilot experiences, several methodological considerations emerged, particularly the importance of starting from real-life needs, adapting learning activities to individual abilities, providing appropriate support and allowing opportunities for practical experimentation and feedback. The findings also highlighted that competence development should be understood in relation to participants' actual involvement in the learning process, rather than solely through the completion of a prototype. These findings, further examined through the competence mapping process, provided the basis for defining the IDEA Maker and IDEA Facilitator competence profiles presented in this Framework



2 The IDEA competence model



2.1 TWO COMPLEMENTARY COMPETENCE PROFILES

IDEA understands a digital maker not simply as a person who can operate fabrication equipment, but as a person who can participate meaningfully in a process that moves from a real need or opportunity to an idea, a designed solution, a prototype, testing, improvement and value creation. Technical competence is therefore integrated with creativity, initiative, collaboration, decision-making and reflection.

Building on this approach, the IDEA Competence Framework identifies two complementary competence profiles: IDEA Makers and IDEA Facilitators. These profiles reflect the different but interconnected roles involved in inclusive design and digital fabrication activities, as outlined in the table below.

Profile	Who it is for	Purpose	Core competence dimensions
IDEA Maker competence profile	Adults with disabilities	Support active participation in ideation, design, fabrication, testing and value creation.	Creative; Digital; Entrepreneurial; Personal & transversal.
IDEA Facilitator competence profile	Adult educators, trainers, disability professionals, FabLab/maker staff	Create accessible conditions, scaffold learning and preserve participant ownership throughout the maker process.	Inclusive facilitation; accessibility; digital pedagogy; scaffolding; assessment; co-design mediation; documentation; stakeholder connection.

2.2 CROSS-CUTTING PRINCIPLES

The IDEA Competence Framework is based on a set of cross-cutting principles that reflect the inclusive and participatory approach of the IDEA methodology. These principles guide how competences are developed, supported and assessed throughout the learning process, ensuring that activities are accessible, meaningful and adapted to participants' individual needs and abilities. They also emphasise the importance of active participation, practical learning and the development of solutions that respond to real needs and contribute to social inclusion. The framework is guided by the following seven principles:

- **Participation and leading role:** People with disabilities are co-designers and makers, not passive recipients of solutions.
- **Accessibility by adaptation:** roles, pace, tools, instructions and materials are adapted while maintaining meaningful learning.
- **User-centred co-design:** lived experience and user feedback are treated as design knowledge.
- **Learning by making:** competences develop through practical, project-based and iterative activity.
- **Progress over uniformity:** participants can demonstrate competence at different levels and with different types of support.
- **Social value:** prototypes are connected to real needs, autonomy, inclusion and community value.
- **Reflection and evidence:** learning is documented through observable actions, participant reflection and prototype development.

2.3 ALIGNMENT WITH EUROPEAN COMPETENCE FRAMEWORKS

The IDEA Competence Framework draws on four European reference frameworks: **EntreComp, DigComp 2.2, LifeComp and DigCompEdu**. These frameworks provide a common European reference for understanding the creative, digital, entrepreneurial, personal, social and educational competences addressed by the IDEA methodology.

The alignment considers the specific characteristics of inclusive co-design and digital fabrication, recognising that competence development may involve different levels of autonomy, participation and support. In particular, EntreComp, DigComp 2.2 and LifeComp provide relevant references for the IDEA Maker profile, while DigCompEdu is particularly relevant to the competences of educators and facilitators.

The following tables summarise the connections between the IDEA competences and the corresponding European competence areas. The mapping represents a conceptual and methodological alignment rather than a formal equivalence or certification against the European frameworks.

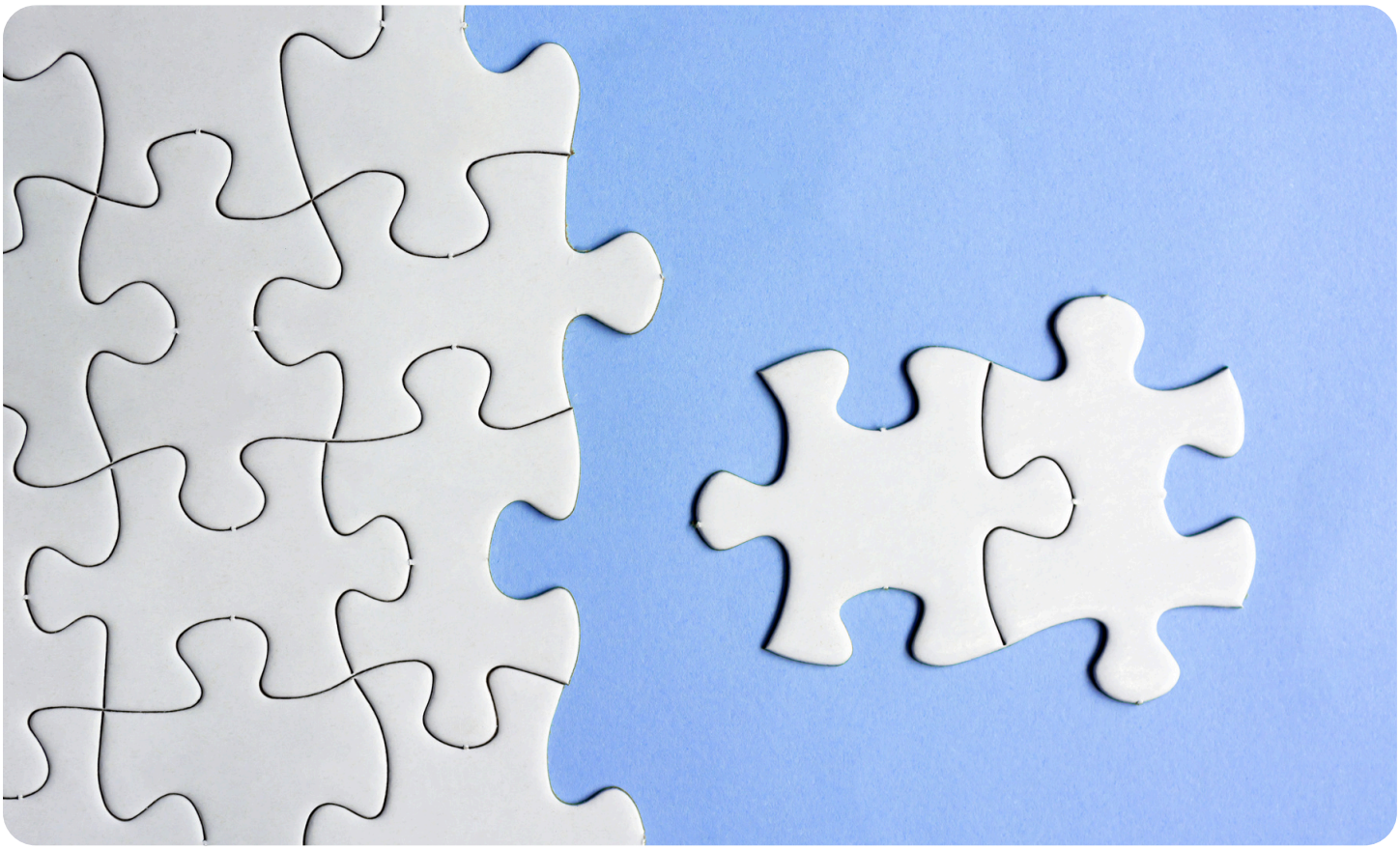

TABLE 1. IDEA MAKER COMPETENCES AND EUROPEAN FRAMEWORK ALIGNMENT

IDEA competence	European framework alignment
C1 – Needs and opportunity identification	EntreComp – Spotting opportunities; LifeComp – Critical thinking
C2 – Idea generation and creative exploration	EntreComp – Creativity; LifeComp – Critical thinking
C3 – Inclusive co-design	EntreComp – Working with others; LifeComp – Communication, Collaboration
C4 – Digital tool use for making	DigComp 2.2 – Information and data literacy, Digital content creation, Problem solving
C5 – Digital design and content creation	DigComp 2.2 – Developing digital content, Integrating and re-elaborating digital content
C6 – Prototyping and fabrication	DigComp 2.2 – Problem solving; EntreComp – Mobilising resources, Planning and management
C7 – Testing, iteration and learning from experience	EntreComp – Learning through experience; LifeComp – Flexibility, Managing learning
C8 – Planning and task organisation	EntreComp – Planning and management, Mobilising resources
C9 – Initiative and decision-making	EntreComp – Taking the initiative, Motivation and perseverance; LifeComp – Self-regulation
C10 – Communication and teamwork	LifeComp – Communication, Collaboration; EntreComp – Working with others
C11 – Accessibility and user-centred evaluation	LifeComp – Critical thinking, Collaboration; EntreComp – Ethical and sustainable thinking
C12 – Value creation and social-impact awareness	EntreComp – Valuing ideas, Ethical and sustainable thinking, Vision

TABLE 2. IDEA FACILITATOR COMPETENCES AND EUROPEAN FRAMEWORK ALIGNMENT

IDEA competence	European framework alignment
FC1 – Inclusive facilitation and learner empowerment	DigCompEdu – Empowering learners; LifeComp – Collaboration
FC2 – Accessibility-oriented activity design	DigCompEdu – Accessibility and inclusion, Differentiation and personalisation
FC3 – Scaffolding digital fabrication learning	DigCompEdu – Teaching and learning, Digital resources
FC4 – Feedback and formative assessment	DigCompEdu – Assessment; LifeComp – Managing learning
FC5 – Co-design mediation	DigCompEdu – Empowering learners; LifeComp – Communication, Collaboration
FC6 – Safe and responsible technology use	DigCompEdu – Facilitating learners' digital competence; DigComp 2.2 – Safety
FC7 – Documentation and reflection	DigCompEdu – Professional engagement, Assessment
FC8 – Community and stakeholder connection	DigCompEdu – Professional engagement; EntreComp – Working with others

This alignment highlights the multidimensional nature of the IDEA methodology, in which technical and digital skills are combined with creativity, collaboration, initiative, accessibility and social value creation.

By connecting the IDEA competences to established European references, the Framework supports their interpretation and potential application across different educational contexts, while maintaining the flexibility required for inclusive and personalised learning pathways.

3 Principles for inclusive implementation



3.1 PRINCIPLES FOR INCLUSIVE IMPLEMENTATION

The effective implementation of the IDEA Competence Framework requires more than the identification of relevant competences and learning outcomes. It also depends on how learning activities are designed, facilitated and adapted to ensure that all participants can actively contribute to the process.

In the IDEA methodology, inclusion is understood as an ongoing process that involves recognising individual needs, creating accessible learning opportunities and ensuring that participants have a meaningful role in the development of solutions.

This approach is particularly important in activities involving co-design, digital fabrication and prototyping, where different levels of technical knowledge, confidence and support may influence participation. Building on the experience of the IDEA pilot activities, the following principles provide practical guidance for educators, facilitators and FabLab staff involved in implementing the Framework.

Meaningful participation

Every participant should have a role that influences the process or the product. Meaningful participation can include identifying a need, choosing among design options, defining dimensions, reviewing a digital model, selecting materials, testing a prototype or proposing improvements. Direct operation of complex machinery is only one possible form of participation

Flexible scaffolding

Facilitators should divide complex tasks into manageable steps, demonstrate processes, use repetition where useful and provide individual support without taking ownership away from participants. Support should be adjusted dynamically according to confidence, ability, fatigue, safety and task complexity.

Accessible communication and environment.

Instructions should be concrete, practical and adapted to participant needs. Physical access, workstation arrangement, tool handling, sensory/cognitive load, timing and breaks should be considered before and during implementation. Accessibility is not a one-time check but an iterative part of the design of the learning experience.

Real-life relevance

The pilots indicate that engagement is strengthened when the challenge is concrete and meaningful. Activities should therefore start, where possible, from participant experiences, everyday barriers or community needs rather than from technology demonstrations alone.

4 IDEA Maker Competence Profile



4.1 MAKER COMPETENCE PROFILE

The Maker Profile contains 12 core competences (C) organised across the four IDEA areas (creative, digital, entrepreneurial, and personal and social competences). Each competence can be developed at different levels and through different technologies.

C1 - Needs and opportunity identification

This competence refers to the ability to recognise everyday challenges, unmet needs and opportunities for improvement in personal or community contexts. Within the IDEA methodology, it encourages participants to draw on their own experiences and observations to identify meaningful problems that can become the starting point for inclusive design and prototyping activities.

Element	Description
Competence area	Creative / Entrepreneurial
Definition	Recognises an everyday, accessibility or participation challenge and reframes it as an opportunity for improvement.
Knowledge	Understands the relevant concepts, process steps, user need and/or tool constraints required to participate in this competence.
Skills	Observe contexts; express needs; distinguish a problem from a possible solution.
Attitudes	Curiosity, user focus, empathy.
Observable learning outcome	Can identify and describe a real-life need or challenge that could be addressed through design.
IDEA phases	Ideation, co-design, design, prototyping, testing and/or reflection depending on the competence.
European alignment	EntreComp: Spotting opportunities; LifeComp: Critical thinking

C2 - Idea generation and creative exploration

This competence involves exploring different possibilities and proposing creative responses to identified needs or challenges. It encourages participants to express ideas, consider alternative solutions and experiment with different approaches. Within IDEA, creativity is understood as an accessible and collaborative process in which every participant can contribute, regardless of their technical experience.

Element	Description
Competence area	Creative
Definition	Generates, combines and develops ideas in response to a concrete challenge.
Knowledge	Understands the relevant concepts, process steps, user need and/or tool constraints required to participate in this competence.
Skills	Brainstorm; visualise alternatives; compare options; contribute original suggestions.
Attitudes	Openness, imagination, willingness to explore.
Observable learning outcome	Can generate and develop one or more possible ideas in response to a challenge.
IDEA phases	Ideation, co-design, design, prototyping, testing and/or reflection depending on the competence.
European alignment	EntreComp: Creativity; LifeComp: Critical thinking

C3 - Inclusive co-design

This competence refers to the ability to participate actively in a collaborative design process, contributing personal perspectives, preferences and ideas to shared decisions. Within the IDEA methodology, inclusive co-design recognises people with disabilities as active contributors to innovation, ensuring that their experiences and feedback influence the development of solutions.

Element	Description
Competence area	Creative / Transversal
Definition	Contributes to a shared design process in which users' needs, preferences and feedback shape the solution.
Knowledge	Understands the relevant concepts, process steps, user need and/or tool constraints required to participate in this competence.
Skills	Explain preferences; listen; negotiate choices; incorporate feedback.
Attitudes	Respect, participation, shared ownership.
Observable learning outcome	Can contribute preferences, feedback and decisions to a shared design process.
IDEA phases	Ideation, co-design, design, prototyping, testing and/or reflection depending on the competence.
European alignment	LifeComp: Collaboration, Communication; EntreComp: Working with others

C4 - Digital tool use for making

This competence involves understanding and engaging with digital tools and technologies used in design and fabrication activities. Within IDEA, it includes exploring the possibilities of digital fabrication equipment, using suitable tools with appropriate support or directing their use through informed choices. The emphasis is on meaningful participation rather than independent technical operation.

Element	Description
Competence area	Digital
Definition	Uses digital devices, applications and fabrication-related tools with appropriate support to contribute to a prototype.
Knowledge	Understands the relevant concepts, process steps, user need and/or tool constraints required to participate in this competence.
Skills	Use basic software; navigate design workflows; operate or contribute to 3D printing/laser cutting processes safely.
Attitudes	Confidence, responsibility, willingness to learn.
Observable learning outcome	Can use or meaningfully engage with digital tools needed for the maker process, with appropriate support.
IDEA phases	Ideation, co-design, design, prototyping, testing and/or reflection depending on the competence.
European alignment	DigComp 2.2: Information/data literacy; Digital content creation; Problem solving

C5 - Digital design and content creation

This competence refers to the ability to understand, interpret and contribute to the creation or modification of digital representations of ideas and solutions. Within the IDEA methodology, participants may engage with drawings, digital models or other design materials, expressing preferences and proposing changes that help transform initial concepts into prototypes.

Element	Description
Competence area	Digital / Creative
Definition	Creates or modifies simple digital content or models that can be translated into a physical prototype.
Knowledge	Understands the relevant concepts, process steps, user need and/or tool constraints required to participate in this competence.
Skills	Create/edit simple designs; understand dimensions and files; iterate digital models.
Attitudes	Accuracy, experimentation.
Observable learning outcome	Can create, modify or critically review a simple digital design/content element for fabrication.
IDEA phases	Ideation, co-design, design, prototyping, testing and/or reflection depending on the competence.
European alignment	DigComp 2.2: Developing digital content; Integrating/re-elaborating digital content

C6 - Prototyping and fabrication

This competence involves participating in the transformation of design ideas into tangible objects or functional prototypes. It includes exploring materials, understanding basic production processes and contributing to fabrication or assembly activities. Within IDEA, participants can engage at different stages and levels of complexity, supported by educators and technical experts when necessary.

Element	Description
Competence area	Digital / Creative
Definition	Transforms an idea into a tangible prototype through a sequence of digital and/or manual fabrication steps.
Knowledge	Understands the relevant concepts, process steps, user need and/or tool constraints required to participate in this competence.
Skills	Select materials/processes; assemble; fabricate; follow workflow.
Attitudes	Persistence, care, practical orientation.
Observable learning outcome	Can contribute to the practical steps required to transform a design into a tangible prototype.
IDEA phases	Ideation, co-design, design, prototyping, testing and/or reflection depending on the competence.
European alignment	DigComp 2.2: Problem solving; EntreComp: Mobilising resources, Planning & management

C7 - Testing, iteration and learning from experience

This competence refers to the ability to explore how a prototype works, identify possible limitations and contribute to its improvement through practical testing and feedback. Within IDEA, it promotes experimentation and reflection, encouraging participants to recognise that design is an iterative process in which initial solutions can be modified and improved.

Element	Description
Competence area	Creative / Transversal / Entrepreneurial
Definition	Tests a solution in realistic conditions, identifies limitations and improves it through successive iterations.
Knowledge	Understands the relevant concepts, process steps, user need and/or tool constraints required to participate in this competence.
Skills	Collect feedback; identify what works/does not; modify design; try again.
Attitudes	Resilience, flexibility, tolerance of error.
Observable learning outcome	Can test a prototype, identify a limitation and contribute to an improvement.
IDEA phases	Ideation, co-design, design, prototyping, testing and/or reflection depending on the competence.
European alignment	EntreComp: Learning through experience; LifeComp: Flexibility, Learning to learn

C8 - Planning and task organisation

This competence involves understanding the main steps required to develop an idea and contributing to the organisation of activities, resources and responsibilities. Within the IDEA methodology, it supports participants in recognising how individual tasks contribute to a shared objective and in developing greater awareness of the practical processes involved in bringing a project to completion.

Element	Description
Competence area	Entrepreneurial / Transversal
Definition	Organises the steps, resources and time needed to move from an idea to a completed prototype.
Knowledge	Understands the relevant concepts, process steps, user need and/or tool constraints required to participate in this competence.
Skills	Sequence tasks; set small goals; monitor progress; ask for resources/support.
Attitudes	Initiative, responsibility.
Observable learning outcome	Can follow and contribute to a sequence of tasks and resources needed to complete a small project.
IDEA phases	Ideation, co-design, design, prototyping, testing and/or reflection depending on the competence.
European alignment	EntreComp: Planning & management, Mobilising resources

C9 - Initiative and decision-making

This competence refers to the ability to express preferences, make choices and take an active role in decisions throughout the design and prototyping process. Within IDEA, it promotes autonomy, confidence and personal agency, recognising that participants can exercise initiative in different ways and with varying levels of support.

Element	Description
Competence area	Entrepreneurial / Transversal
Definition	Takes an active role in the process and makes informed choices about design, usability and implementation.
Knowledge	Understands the relevant concepts, process steps, user need and/or tool constraints required to participate in this competence.
Skills	Propose actions; choose among options; justify preferences; seek support when needed.
Attitudes	Autonomy, self-efficacy.
Observable learning outcome	Can take initiative and make small informed decisions during the project.
IDEA phases	Ideation, co-design, design, prototyping, testing and/or reflection depending on the competence.
European alignment	EntreComp: Motivation & perseverance, Taking the initiative; LifeComp: Self-regulation

C10 - Communication and teamwork

This competence involves sharing ideas, expressing needs, listening to others and contributing to collaborative activities. Within the IDEA methodology, communication and teamwork are essential for bringing together the experiences of people with disabilities, educators and technical experts. Different communication methods and forms of participation are recognised to ensure that everyone can contribute meaningfully.

Element	Description
Competence area	Transversal
Definition	Communicates ideas, needs and feedback and works constructively with peers, educators and technical staff.
Knowledge	Understands the relevant concepts, process steps, user need and/or tool constraints required to participate in this competence.
Skills	Explain ideas; listen; give/receive feedback; coordinate with others.
Attitudes	Respect, trust, cooperation.
Observable learning outcome	Can communicate ideas and feedback and collaborate with others during the maker process.
IDEA phases	Ideation, co-design, design, prototyping, testing and/or reflection depending on the competence.
European alignment	LifeComp: Communication, Collaboration; EntreComp: Working with others

C11 - Accessibility and user-centred evaluation

This competence refers to the ability to consider whether a proposed solution is accessible, usable and appropriate for the people it is intended to support. Within IDEA, it encourages participants to evaluate prototypes from the user's perspective, drawing on personal experiences, practical testing and feedback to identify possible improvements.

Element	Description
Competence area	Creative / Transversal
Definition	Evaluates whether a solution responds to users' real abilities, contexts and accessibility requirements.
Knowledge	Understands the relevant concepts, process steps, user need and/or tool constraints required to participate in this competence.
Skills	Observe usability; identify barriers; adapt dimensions/features; prioritise autonomy.
Attitudes	Empathy, inclusion, attention to diversity.
Observable learning outcome	Can identify usability or accessibility barriers and propose/adopt changes to improve the solution.
IDEA phases	Ideation, co-design, design, prototyping, testing and/or reflection depending on the competence.
European alignment	LifeComp: Collaboration/Critical thinking; EntreComp: Ethical & sustainable thinking

C12 - Value creation and social-impact awareness

This competence involves recognising how an idea or prototype may respond to a real need and create value for individuals or communities. Within the IDEA methodology, it encourages participants to consider the potential benefits, usefulness and wider social relevance of their solutions, while recognising the importance of further testing and validation before making claims about their impact.

Element	Description
Competence area	Entrepreneurial
Definition	Understands that a prototype can create practical and social value beyond the learning activity.
Knowledge	Understands the relevant concepts, process steps, user need and/or tool constraints required to participate in this competence.
Skills	Identify beneficiaries; describe usefulness; consider replicability, affordability and potential applications.
Attitudes	Social responsibility, opportunity orientation.
Observable learning outcome	Can explain the usefulness of a prototype, who may benefit from it and how it creates social/practical value.
IDEA phases	Ideation, co-design, design, prototyping, testing and/or reflection depending on the competence.
European alignment	EntreComp: Valuing ideas; Ethical & sustainable thinking; Vision

5 IDEA Facilitator Competence Profile



5.1 IDEA FACILITATOR COMPETENCE PROFILE

The facilitator profile recognises that inclusive maker learning depends on the quality of facilitation as much as on the availability of technology. Educators and FabLab staff need complementary competences that combine pedagogy, accessibility and technical mediation.

FC1 - Inclusive facilitation and learner empowerment

This competence refers to the ability to create learning environments in which people with disabilities can participate actively, express their preferences and contribute to decisions. Within the IDEA methodology, facilitators support individual autonomy and confidence, adapting their approach to participants' needs while ensuring that assistance does not replace their ownership of the creative process.

Element	Description
Definition	Creates conditions in which People with disabilities participate as active co-designers and decision-makers rather than passive recipients.
Indicative learning outcome	The facilitator can apply inclusive facilitation and learner empowerment in an IDEA-type pathway and document how it supports participant autonomy and competence development.
Evidence examples	Adapted instructions or roles; facilitation notes; observation records; participant feedback; documented design decisions; accessibility adaptations; prototype iterations.
European alignment	DigCompEdu: Empowering learners; LifeComp: Collaboration

FC2 - Accessibility-oriented activity design

This competence involves planning and adapting learning activities to accommodate different abilities, communication needs and levels of experience. Within IDEA, facilitators consider the accessibility of spaces, tools, materials, instructions and learning tasks, identifying possible barriers and introducing appropriate adjustments to support meaningful participation throughout the process.

Element	Description
Definition	Adapts pace, instructions, roles, tools and materials to different abilities while preserving meaningful participation.
Indicative learning outcome	The facilitator can apply accessibility-oriented activity design in an IDEA-type pathway and document how it supports participant autonomy and competence development.
Evidence examples	Adapted instructions or roles; facilitation notes; observation records; participant feedback; documented design decisions; accessibility adaptations; prototype iterations.
European alignment	DigCompEdu: Accessibility and inclusion / Differentiation and personalisation

FC3 - Scaffolding digital fabrication learning

This competence refers to the ability to introduce digital design and fabrication processes in an accessible and progressive way. Within the IDEA methodology, facilitators break down complex activities into manageable steps, provide demonstrations and practical guidance, and gradually adjust the level of support according to participants' confidence, abilities and learning progress.

Element	Description
Definition	Breaks complex fabrication processes into manageable steps, combines demonstration with hands-on practice and gradually reduces support.
Indicative learning outcome	The facilitator can apply scaffolding digital fabrication learning in an IDEA-type pathway and document how it supports participant autonomy and competence development.
Evidence examples	Adapted instructions or roles; facilitation notes; observation records; participant feedback; documented design decisions; accessibility adaptations; prototype iterations.
European alignment	DigCompEdu: Teaching and learning; Digital resources

FC4 - Feedback and formative assessment

This competence involves observing participants' learning processes, providing constructive feedback and identifying opportunities for further development. Within IDEA, facilitators use flexible assessment approaches that recognise individual progress, practical contributions and different forms of participation, rather than relying exclusively on technical performance or the quality of the final prototype.

Element	Description
Definition	Uses observation, dialogue, prototype testing and participant feedback to support progress and document competence development.
Indicative learning outcome	The facilitator can apply feedback and formative assessment in an IDEA-type pathway and document how it supports participant autonomy and competence development.
Evidence examples	Adapted instructions or roles; facilitation notes; observation records; participant feedback; documented design decisions; accessibility adaptations; prototype iterations.
European alignment	DigCompEdu: Assessment; LifeComp: Learning to learn

FC5 - Co-design mediation

This competence refers to the ability to support collaboration and shared decision-making among participants, educators and technical experts. Within the IDEA methodology, facilitators encourage dialogue, help participants communicate their ideas and ensure that different perspectives are considered throughout the design process, particularly when balancing user preferences with technical possibilities.

Element	Description
Definition	Connects participant experience, educator support and technical maker expertise, ensuring that user feedback drives design decisions.
Indicative learning outcome	The facilitator can apply co-design mediation in an IDEA-type pathway and document how it supports participant autonomy and competence development.
Evidence examples	Adapted instructions or roles; facilitation notes; observation records; participant feedback; documented design decisions; accessibility adaptations; prototype iterations.
European alignment	DigCompEdu: Empowering learners; LifeComp: Communication/Collaboration

FC6 - Safe and responsible technology use

This competence involves ensuring that digital tools, fabrication equipment and materials are used in ways that protect participants' safety and well-being. Within IDEA, facilitators assess potential risks, communicate safety procedures in accessible formats and provide appropriate supervision, while promoting responsible technology use and maintaining opportunities for active participation.

Element	Description
Definition	Supports safe, appropriate and responsible use of digital fabrication equipment and materials.
Indicative learning outcome	The facilitator can apply safe and responsible technology use in an IDEA-type pathway and document how it supports participant autonomy and competence development.
Evidence examples	Adapted instructions or roles; facilitation notes; observation records; participant feedback; documented design decisions; accessibility adaptations; prototype iterations.
European alignment	DigCompEdu: Facilitating learners' digital competence; DigComp 2.2: Safety

FC7 - Documentation and reflection

This competence refers to the ability to document learning activities, participants' contributions and the development of prototypes in a structured and accessible way. Within the IDEA methodology, facilitators collect relevant evidence, encourage reflection and use documentation to identify learning progress, support evaluation and share experiences that may inform future activities.

Element	Description
Definition	Documents iterations, learning evidence and adaptations so that the process can be evaluated, shared and replicated.
Indicative learning outcome	The facilitator can apply documentation and reflection in an IDEA-type pathway and document how it supports participant autonomy and competence development.
Evidence examples	Adapted instructions or roles; facilitation notes; observation records; participant feedback; documented design decisions; accessibility adaptations; prototype iterations.
European alignment	DigCompEdu: Professional engagement; Assessment

FC8 - Community and stakeholder connection

This competence involves establishing and maintaining relationships with organisations, professionals and community stakeholders who can contribute to inclusive design and learning activities. Within IDEA, facilitators support cooperation between disability organisations, educational institutions, FabLabs and other relevant actors, helping connect participants' ideas with real-life needs and opportunities for further development.

Element	Description
Definition	Links learning activities with real-life needs, FabLabs, disability organisations, training providers and potential users/stakeholders.
Indicative learning outcome	The facilitator can apply community and stakeholder connection in an IDEA-type pathway and document how it supports participant autonomy and competence development.
Evidence examples	Adapted instructions or roles; facilitation notes; observation records; participant feedback; documented design decisions; accessibility adaptations; prototype iterations.
European alignment	DigCompEdu: Professional engagement; EntreComp: Working with others

6 Progression and learning outcomes



6.1 PRINCIPLES FOR INCLUSIVE IMPLEMENTATION

To preserve accessibility and transferability, IDEA uses a flexible three-stage progression model. The stages describe increasing participation and autonomy, but they should not be treated as rigid levels or prerequisites. A participant may demonstrate different stages across different competences.

Stage	Descriptor	Typical evidence
1 – Explore with support	The learner participates with structured guidance, demonstration or adapted roles and begins to recognise the purpose of the task.	Expresses a need/preference; follows a demonstrated step; chooses between options; participates in testing.
2 – Contribute with growing autonomy	The learner performs meaningful parts of the process, makes choices and applies learning with occasional support.	Generates ideas; edits/reviews a design; organises steps; explains feedback; proposes a modification.
3 – Apply and transfer	The learner applies the competence more independently, connects steps and can transfer learning to a new task or context.	Initiates a solution; adapts a process; explains rationale; supports peers; applies learning to another challenge.

Progression should be judged against the participant's starting point and the accessibility conditions of the task. The aim is empowerment and competence development, not comparison between participants.

7 Implementation pathway



7.1 IMPLEMENTATION PATHWAY

The Framework can be applied through the following eight-step cycle. The cycle reflects the common methodological sequence identified in the national pilots while allowing local adaptation.

Step	Purpose	Key actions	Competence focus
1. Prepare	Create accessible learning conditions.	Accessibility check; participant profile; roles; safety; tools/materials.	Facilitator F1–F3, F6
2. Explore needs	Identify meaningful challenges.	Observation, discussion, user stories, problem framing.	Makers: C1, C10, C11 Facilitators: FC1, FC2, FC5
3. Generate ideas	Develop possible responses.	Brainstorming, sketches, comparison of alternatives.	Makers: C2, C3, C9 Facilitators: FC1, FC5
4. Plan	Turn an idea into manageable steps.	Define tasks, resources, responsibilities and sequence.	Makers: C8, C9, C10 Facilitators: FC1, FC2, FC3
5. Design	Create/modify a design for fabrication.	Digital modelling/content creation, dimensions, material choices.	Makers: C4, C5 Facilitators: FC2, FC3, FC6
6. Make	Produce the prototype.	Fabrication, assembly, guided tool use.	Makers: C4, C6, C10 Facilitators: FC1, FC3, FC6
7. Test & iterate	Evaluate usability and improve.	Realistic testing, feedback, redesign, re-fabrication where needed.	Makers: C7, C11 Facilitators: FC4, FC5, FC6
8. Reflect & share	Consolidate learning and value.	Competence reflection, documentation, presentation, possible next use.	Makers: C12 + transversal competences Facilitators: FC4, FC7, FC8

The competences indicated for each step represent the main areas of focus. However, facilitator competences are transversal and may be applied throughout the entire pathway, depending on participants' needs and the learning context.

8 Exploitation and replication guidelines



8.1 GUIDELINES FOR ADULT EDUCATION AND ORGANIZATIONS WORKING IN THE FIELD OF SOCIAL INCLUSION

This section provides practical exploitation guidelines to support educators, training centres, FabLabs and non-formal education organisations in implementing the IDEA methodology, making effective use of its innovative approaches and adapting them to different educational and community contexts.

- Start from participant interests and everyday challenges rather than from available technology.
- Build partnerships with a FabLab, makerspace, university laboratory or technical organisation where internal fabrication capacity is limited.
- Use the competence profile to define learning objectives before activities begin and to document progress afterwards.
- Plan flexible roles so that participants with different abilities can influence meaningful parts of the process.
- Integrate the maker pathway into employability, autonomy, life-skills or social inclusion programmes where appropriate.

8.2 GUIDELINES FOR FABLABS AND MAKERSPACES

- Carry out accessibility and safety checks before the activity and identify alternative ways to participate in complex technical steps.
- Work with disability professionals and participants as co-design partners; technical feasibility should not override user experience.
- Prioritise simple, affordable and reproducible solutions where this supports adoption and social impact.
- Document files, materials, settings and iterations so prototypes can be reproduced or adapted.
- Use accessible demonstrations and allow sufficient time for testing and revision.

8.3 GUIDELINES FOR EDUCATORS AND TRAINERS

- Use the Facilitator Competence Profile as a reflective checklist for planning and professional development.
- Avoid completing tasks on behalf of participants when an adapted role can preserve ownership.
- Assess learning through multiple forms of evidence, not only written tests or technical independence.
- Make learning visible by discussing what changed between the first idea and the final prototype.
- Connect creative and digital tasks with communication, planning, initiative and social-value reflection.

8.4 GUIDELINES FOR ORGANISATIONS REPLICATING IDEA IN A NEW CONTEXT

	Minimum recommendation
Who participates?	Define target group, support needs, interests and existing strengths; avoid one-size-fits-all assumptions.
Where?	Use an accessible workshop/FabLab/makerspace or adapt another environment with suitable equipment and safety procedures.
Who facilitates?	Combine educational/disability expertise with maker/technical expertise; clarify roles before implementation.
What challenge?	Select real, meaningful and feasible challenges with clear user relevance.
What technology?	Choose technology after the challenge is understood; technology is a means, not the starting point.
How long?	Allow enough time for familiarisation, prototyping and at least one meaningful testing/iteration cycle.
How is learning assessed?	Use pre/post reflection where appropriate, observation, process evidence and prototype testing.
How is sustainability supported?	Keep documentation, reusable files/resources, partnerships and staff competence active beyond the pilot.

CONCLUSIONS

The IDEA Competence Framework represents a practical outcome of the IDEA project, translating the methodology and the experience gained through pilot activities in Italy, Norway and Spain into a structured model for inclusive digital making. The pilot experiences highlighted that digital fabrication and co-design activities can offer meaningful opportunities for adults with disabilities to develop creative, digital, entrepreneurial and personal competences. They also demonstrated that meaningful participation does not necessarily depend on the ability to use technologies independently or to complete a prototype, but on the opportunity to contribute actively to the different stages of the creative process, according to individual abilities, interests and needs.

Building on these findings, the Framework identifies two complementary competence profiles: IDEA Makers and IDEA Facilitators. While the Maker profile focuses on the competences developed through participation in design and fabrication activities, the Facilitator profile recognises the essential role of educators, trainers and FabLab professionals in creating accessible learning environments, adapting activities and supporting participants' autonomy and decision-making. Beyond identifying competences, the Framework provides practical tools to support their development, observation and assessment. Its progression model, implementation pathway and supporting instruments offer a flexible reference for organisations wishing to integrate inclusive digital making into their educational activities.

The value of the IDEA Competence Framework therefore extends beyond the project itself. Together with the IDEA Toolkit and the Prototype Catalogue, it provides a foundation for transferring and adapting the IDEA methodology to different educational, social and community contexts. Ultimately, the Framework promotes an approach in which people with disabilities are recognised not simply as beneficiaries of educational activities, but as active creators, collaborators and contributors to solutions addressing real-life needs. By combining accessibility, creativity, technology and meaningful participation, IDEA offers a model for making digital education and innovation more inclusive.



9 Annexes



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10. ANNEX A – DETAILED COMPETENCE DEVELOPMENT CARDS

The following cards operationalise the IDEA Maker Competence Profile. They are proposed descriptors for future implementation, not retrospective claims that every pilot participant demonstrated each outcome. Evidence must be collected with participants, and the amount of support provided should be documented without treating supported participation as failure.

C1 – NEEDS AND OPPORTUNITY IDENTIFICATION

Competence definition: Describe a meaningful everyday participation or accessibility challenge from personal experience or observation.

Element	Operational descriptor
Knowledge	Recognises the purpose, relevant context and basic terminology of this competence.
Skills	Needs discussion; accessible interviews; selecting one challenge.
Attitudes	Curiosity, respect for lived experience, willingness to test and revise ideas.
Illustrative learning outcome	Participant identifies a priority and explains why it matters, using their preferred communication mode.
Possible evidence	Record participant's own words or choices, consented notes, and the agreed problem statement.
Assessment safeguard	Evaluate participation relative to an accessible individual starting point; record support and choice, not just technical execution.

C2 – IDEA GENERATION AND CREATIVE EXPLORATION

Competence definition: Propose or compare different responses to an identified need.

Element	Operational descriptor
Knowledge	Recognises the purpose, relevant context and basic terminology of this competence.
Skills	Sketching, tactile models, image prompts, group brainstorming.

Attitudes	Curiosity, respect for lived experience, willingness to test and revise ideas.
Illustrative learning outcome	Participant offers an option, compares alternatives or adapts a suggestion.
Possible evidence	Keep sketches, option cards and decision notes; distinguish own ideas from facilitator prompts.
Assessment safeguard	Evaluate participation relative to an accessible individual starting point; record support and choice, not just technical execution.

C3 – INCLUSIVE CO-DESIGN

Competence definition: Contribute to decisions with peers and technical experts.

Element	Operational descriptor
Knowledge	Recognises the purpose, relevant context and basic terminology of this competence.
Skills	Joint design meetings; reviewing dimensions, shape and usability.
Attitudes	Curiosity, respect for lived experience, willingness to test and revise ideas.
Illustrative learning outcome	Participant influences a design choice and can express agreement or disagreement.
Possible evidence	Capture design changes linked to feedback and record how decisions were made.
Assessment safeguard	Evaluate participation relative to an accessible individual starting point; record support and choice, not just technical execution.

C4 – DIGITAL TOOL USE FOR MAKING

Competence definition: Use or direct the use of suitable digital fabrication tools safely and meaningfully.

Element	Operational descriptor
Knowledge	Recognises the purpose, relevant context and basic terminology of this competence.

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Skills	Guided equipment demonstration, slicing preview, supervised printing.
Attitudes	Curiosity, respect for lived experience, willingness to test and revise ideas.
Illustrative learning outcome	Participant selects a tool or performs an appropriate step with agreed support.
Possible evidence	Use safety checklist, observation notes and accessible tool-use log.
Assessment safeguard	Evaluate participation relative to an accessible individual starting point; record support and choice, not just technical execution.

C5 – Digital design and content creation

Competence definition: Interpret or modify a digital representation of a solution.

Element	Operational descriptor
Knowledge	Recognises the purpose, relevant context and basic terminology of this competence.
Skills	CAD preview, changing parameters, comparing virtual shapes.
Attitudes	Curiosity, respect for lived experience, willingness to test and revise ideas.
Illustrative learning outcome	Participant communicates a desired change to a digital model or makes the change.
Possible evidence	Keep versioned screenshots and explanation of who executed each change.
Assessment safeguard	Evaluate participation relative to an accessible individual starting point; record support and choice, not just technical execution.

C6 – Prototyping and fabrication

Competence definition: Participate in producing and assembling a tangible prototype.

Element	Operational descriptor
Knowledge	Recognises the purpose, relevant context and basic terminology of this competence.

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Skills	Material selection, printing, finishing, assembly.
Attitudes	Curiosity, respect for lived experience, willingness to test and revise ideas.
Illustrative learning outcome	Participant contributes to a fabrication decision or step according to their preferences.
Possible evidence	Photograph agreed stages; note safety measures, assistance and material choices.
Assessment safeguard	Evaluate participation relative to an accessible individual starting point; record support and choice, not just technical execution.

C7 – Testing, iteration and learning from experience

Competence definition: Assess usability and propose changes after trying a prototype.

Element	Operational descriptor
Knowledge	Recognises the purpose, relevant context and basic terminology of this competence.
Skills	Structured user test, comfort check, comparison of versions.
Attitudes	Curiosity, respect for lived experience, willingness to test and revise ideas.
Illustrative learning outcome	Participant describes or signals what works and requests a refinement.
Possible evidence	Collect feedback in accessible format and trace revisions to that feedback.
Assessment safeguard	Evaluate participation relative to an accessible individual starting point; record support and choice, not just technical execution.

C8 – Planning and task organisation

Competence definition: Recognise tasks, resources and sequence in a manageable project.

Element	Operational descriptor

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Knowledge	Recognises the purpose, relevant context and basic terminology of this competence.
Skills	Visual task boards, short milestones, role allocation.
Attitudes	Curiosity, respect for lived experience, willingness to test and revise ideas.
Illustrative learning outcome	Participant identifies the next step or chooses a role.
Possible evidence	Save task-board snapshots and a short facilitator observation.
Assessment safeguard	Evaluate participation relative to an accessible individual starting point; record support and choice, not just technical execution.

C9 – Initiative and decision-making

Competence definition: Exercise choice and agency during the making process.

Element	Operational descriptor
Knowledge	Recognises the purpose, relevant context and basic terminology of this competence.
Skills	Choosing features, priorities, materials or presentation method.
Attitudes	Curiosity, respect for lived experience, willingness to test and revise ideas.
Illustrative learning outcome	Participant initiates an action or makes an informed choice.
Possible evidence	Log choices without confusing independent performance with unsupported participation.
Assessment safeguard	Evaluate participation relative to an accessible individual starting point; record support and choice, not just technical execution.

C10 – Communication and teamwork

Competence definition: Share ideas and work with others using accessible channels.

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Element	Operational descriptor
Knowledge	Recognises the purpose, relevant context and basic terminology of this competence.
Skills	Small-group discussions, AAC, paired demonstrations.
Attitudes	Curiosity, respect for lived experience, willingness to test and revise ideas.
Illustrative learning outcome	Participant gives or receives feedback and helps reach a shared decision.
Possible evidence	Use a collaborative observation record with participant confirmation.
Assessment safeguard	Evaluate participation relative to an accessible individual starting point; record support and choice, not just technical execution.

C11 – Accessibility and user-centred evaluation

Competence definition: Consider whether a solution is usable and relevant for its intended users.

Element	Operational descriptor
Knowledge	Recognises the purpose, relevant context and basic terminology of this competence.
Skills	User journeys, ergonomic checks, trial in relevant contexts.
Attitudes	Curiosity, respect for lived experience, willingness to test and revise ideas.
Illustrative learning outcome	Participant identifies at least one accessibility or usability consideration.
Possible evidence	Record user-test conditions and unresolved limitations.
Assessment safeguard	Evaluate participation relative to an accessible individual starting point; record support and choice, not just technical execution.

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C12 – VALUE CREATION AND SOCIAL-IMPACT AWARENESS

Competence definition: Explain who may benefit from a solution and what further validation is needed.

Element	Operational descriptor
Knowledge	Recognises the purpose, relevant context and basic terminology of this competence.
Skills	Stakeholder mapping, impact reflection, simple value proposition.
Attitudes	Curiosity, respect for lived experience, willingness to test and revise ideas.
Illustrative learning outcome	Participant identifies potential beneficiaries and one possible benefit or risk.
Possible evidence	Collect accessible pitch, stakeholder map or reflection; avoid claims of market readiness.
Assessment safeguard	Evaluate participation relative to an accessible individual starting point; record support and choice, not just technical execution.

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ANNEX B – FACILITATOR PRACTICE CARDS

These descriptors translate the facilitator profile into practical behaviours. They are proposed for educator reflection and peer review, not a claim that all pilot teams were assessed against a common rubric.

F1 INCLUSIVE FACILITATION

Practice standard: Invite participant-led priorities; allow meaningful refusal and choice; avoid taking over decisions.

Before	During	After
Ask which adaptations and preferences matter; agree responsibilities.	Observe access and participation; offer options rather than assuming needs.	Reflect with the participant; note evidence, adaptations and next steps.

F2 ACCESSIBLE ACTIVITY DESIGN

Practice standard: Offer multiple communication modes, adjustable pace, accessible workstations and alternative task routes.

Before	During	After
Ask which adaptations and preferences matter; agree responsibilities.	Observe access and participation; offer options rather than assuming needs.	Reflect with the participant; note evidence, adaptations and next steps.

F3 DIGITAL FABRICATION SCAFFOLDING

Practice standard: Break tool demonstrations into steps, offer safe supported participation and gradually adjust assistance.

Before	During	After
Ask which adaptations and preferences matter; agree responsibilities.	Observe access and participation; offer options rather than assuming needs.	Reflect with the participant; note evidence, adaptations and next steps.

F4 FORMATIVE ASSESSMENT

Practice standard: Use baseline conversations, frequent feedback, evidence portfolios and transparent recording of support.

Before	During	After
Ask which adaptations and preferences matter; agree responsibilities.	Observe access and participation; offer options rather than assuming needs.	Reflect with the participant; note evidence, adaptations and next steps.

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F5 Co-design mediation

Practice standard: Balance lived experience and technical expertise; make design decisions visible and negotiable.

Before	During	After
Ask which adaptations and preferences matter; agree responsibilities.	Observe access and participation; offer options rather than assuming needs.	Reflect with the participant; note evidence, adaptations and next steps.

F6 Safe and responsible technology use

Practice standard: Complete risk checks; establish equipment supervision, consent and data handling procedures.

Before	During	After
Ask which adaptations and preferences matter; agree responsibilities.	Observe access and participation; offer options rather than assuming needs.	Reflect with the participant; note evidence, adaptations and next steps.

F7 Documentation and reflection

Practice standard: Capture versions, participant feedback, limitations and decisions with accessible consent.

Before	During	After
Ask which adaptations and preferences matter; agree responsibilities.	Observe access and participation; offer options rather than assuming needs.	Reflect with the participant; note evidence, adaptations and next steps.

F8 Community connection

Practice standard: Identify relevant users, local makers, disability organisations and realistic next-step partners.

Before	During	After
Ask which adaptations and preferences matter; agree responsibilities.	Observe access and participation; offer options rather than assuming needs.	Reflect with the participant; note evidence, adaptations and next steps.

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1. ANNEX C – PROGRESSION MODEL AND ASSESSMENT RUBRICS

A three-stage developmental continuum is suggested for local use. It is not an EQF certification scale, and progression is not defined by absence of support. Learners may demonstrate different levels across competencies and tasks.

Stage	Observable participation	Facilitator response
Exploring	Recognises a task or option; expresses a preference; participates with suitable supports.	Provide accessible choices, demonstrations and safe experimentation.
Contributing	Makes decisions, contributes to making or testing, explains preferences in an accessible form.	Support shared decision-making and document contributions.
Extending	Transfers a strategy, proposes a revision or helps communicate an outcome in a new situation.	Offer additional autonomy, challenge and opportunities for reflection.

1.1. SAMPLE OBSERVATION RECORD

Field	Prompt
Participant and consent code	Use a pseudonym; document consent and permitted use of images.
Activity and competence	Which IDEA phase and competence were observed?
Starting point	What was the participant already comfortable doing?
Choice and contribution	What did the participant select, communicate, make or revise?
Support provided	Which physical, communicative or technical adaptations were used?
Evidence	Reference photo, version, note, audio or participant statement.
Reflection and next step	What does the participant want to do next?

EXAMPLE OF EVIDENCE–BASED JUDGEMENT

During a prototype trial, a learner indicates that the handle is uncomfortable and chooses between two redesigned shapes. This may support C7 (testing and iteration), C9 (decision-

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making) and C11 (user-centred evaluation). It does not, by itself, establish independent CAD proficiency or entrepreneurial competence. Record who modelled the revision and how the participant's feedback affected it.

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ANNEX D – READY-TO-USE IMPLEMENTATION INSTRUMENTS

1.2. F1. ACCESSIBLE PARTICIPANT REFLECTION

Offer these prompts orally, visually, in easy-to-read format or through augmentative communication.

Field	What to record
I helped decide…	Choice or decision
I tried…	Activity or tool
Something that worked…	Positive experience
Something I would change…	Feedback
Next time I would like…	Future goal

1.3. F2. SESSION PLANNING SHEET

Complete jointly with a maker and a support professional before each session.

Field	What to record
Session purpose	Relevant competence and real-life need
Access and communication	Individual preferences and adjustments
Materials and tools	Equipment, safety, alternatives
Participant decisions	Choices to be offered explicitly
Evidence collection	What can be recorded with consent?
Review	Who will gather and act on feedback?

1.4. F3. PROTOTYPE ITERATION LOG

Use one entry for each significant version or testing cycle.

Field	What to record
Version and date	Design reference
User-identified issue	What need or difficulty was observed?
Proposed change	Who suggested it?
Fabrication change	Who implemented it?
Test and feedback	What happened under which conditions?
Next action	Retest, modify, stop or seek specialist advice

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1.5. F4. REPLICATION READINESS CHECKLIST

A practical pre-launch gate for organisations adopting IDEA.

Field	What to record
Partnership	Disability organisation and maker expertise identified
Participant ownership	Consent and choice processes agreed
Accessibility	Venue, communication and alternative participation routes reviewed
Safety	Risk assessment and trained equipment supervision in place
Learning design	Competence targets and adaptable tasks selected
Evaluation	Baseline, formative feedback and accessible evidence plan ready
Sustainability	Maintenance, costs and potential partners considered

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ANNEX E – APPLIED LEARNING PATHWAYS USING THE PROTOTYPE PORTFOLIO

The following pathways are illustrative educational uses of prototypes described in the IDEA Catalogue. They are not reconstructed individual assessment records. In particular, a prototype's existence should not be used as proof of specific competence gains for every participant.

1.6. GRABBER

Illustrative design challenge: Grasping and handling objects.

Learning sequence: Explore gripping needs; compare ergonomic options; observe or participate in digital design; test comfort; revise.

IDEA stage	Competence opportunities	Evidence to seek
Understanding needs	C1, C11	Participant-defined challenge
Co-design	C2, C3, C9, C10	Options and choices
Concept development	C5, C8	Annotated model or concept
Prototyping and testing	C4, C6, C7	Participation and iteration log
Validation and communication	C10, C12	Accessible reflection and cautious benefit statement

1.7. EASYPEN

Illustrative design challenge: Supporting writing or pen handling.

Learning sequence: Identify writing-related barriers; co-design dimensions; test alternative forms; document usability feedback.

IDEA stage	Competence opportunities	Evidence to seek
Understanding needs	C1, C11	Participant-defined challenge
Co-design	C2, C3, C9, C10	Options and choices
Concept development	C5, C8	Annotated model or concept
Prototyping and testing	C4, C6, C7	Participation and iteration log
Validation and communication	C10, C12	Accessible reflection and cautious benefit statement

1.8. SATISPRAY

Illustrative design challenge: Facilitating use of a spray mechanism.

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Learning sequence: Discuss functional barriers; assess grip and activation; test a fabricated adaptation; identify next refinements.

IDEA stage	Competence opportunities	Evidence to seek
Understanding needs	C1, C11	Participant-defined challenge
Co-design	C2, C3, C9, C10	Options and choices
Concept development	C5, C8	Annotated model or concept
Prototyping and testing	C4, C6, C7	Participation and iteration log
Validation and communication	C10, C12	Accessible reflection and cautious benefit statement

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