SILVER CODERS

IO1:

METHODOLOGICAL DIGITAL LEARNING FRAMEWORK

-

EXECUTIVE SUMMARY

Project reference	2020-1-SE01-KA227-ADU-092582
Intellectual output / Activity	IO1-METHODOLOGICAL DIGITAL LEARNING FRAMEWORK
Dissemination level	GLOBAL
Date	22/10/2021
Document version	0.9
Status	DRAFT
Authors	VIRTUAL CAMPUS LDA / FU-UPPSALA
Reviewer	ALL PARTNERS
Contributors	ALL PARTNERS
Approved by	STEERING COMMITTEE

CONTENTS

INTRODUCTION

One of the main objectives of the Digital Skills and Jobs Coalition. as defined by the European Union. is to ensure that everyone has the right digital skills to thrive in society and on the labour market. Therefore. there is a need to improve the citizens' skills. especially older adults' competencies. since their digital exclusion prevents them from being fully integrated into the Knowledge and Information Society. This exclusion became even more prominent in the context of the COVID-19 pandemic crisis. which exposed some groups' difficulty in adapting to the new societal challenges. In particular. it is important to focus on coding and programming skills. since coding improves skills like problem-solving. collaboration. analytical thinking. creativity. and communication across physical and geographical boundaries.

The SILVERCODERS (Developing the Creativity of Older Adults through Coding) project intends to develop trainers and adult learners' digital. coding and creative abilities by engaging institutions and organisations in formal. informal. and non-formal education for adults. Doing so will provide adults with the necessary tools and competencies to develop creative and innovative solutions to face new risks and challenges. both in personal. educational and professional contexts.

As a first result. the consortium developed a sound methodological learning framework for building programming and coding skills among older adults. The framework was based on a set of studies and analysis:

- Identification of the needs of the major stakeholders in adult education. that is. the adults and trainers.

- Analysis of the current situation in adult education about the teaching of coding and programming.

- Identification of the deployment of digital learning tools in the context of digital skill development and. particularly. in relation to coding and programming skills.

SKATEHOLDERS

The consortium proceeded with the analysis of a precise map of stakeholder groups that stand to benefit directly or indirectly from innovative pedagogical interventions that promote programming skill development in line with community and real-world needs:

### 1.   TRAINERS, ADULT EDUCATORS OR SPECIALIST STAFF

- Will develop new pedagogical and ICT skills to promote and teach the use of digital training tools in their training practices.

- Will improve their training and support offer on the creation and digitization side using coding.

- Will be able to use and adapt the educational resources of SILVERCODERS.

2.   ADULT LEARNERS

- Will increase their digital skills and literacy.

- Will understand the concepts of programming and coding and being able to create apps and becoming more tenderers for employers.

- Will reinforce their cognitive and creative skills.

- Will mprove their employability skills.

3.   ORGANIZATIONS CONNECTED TO ADULT TRAINING AND WELL-BEING

- Will be able to provide innovative solutions for enhancing the use of digital tools by adults.

- Will have an increased awareness on problems faced by trainers and adults regarding the use of digital channels and tools and how they can be improved Indirectly. there will be a set of different organizations that. by their nature. will also become relevant stakeholders.
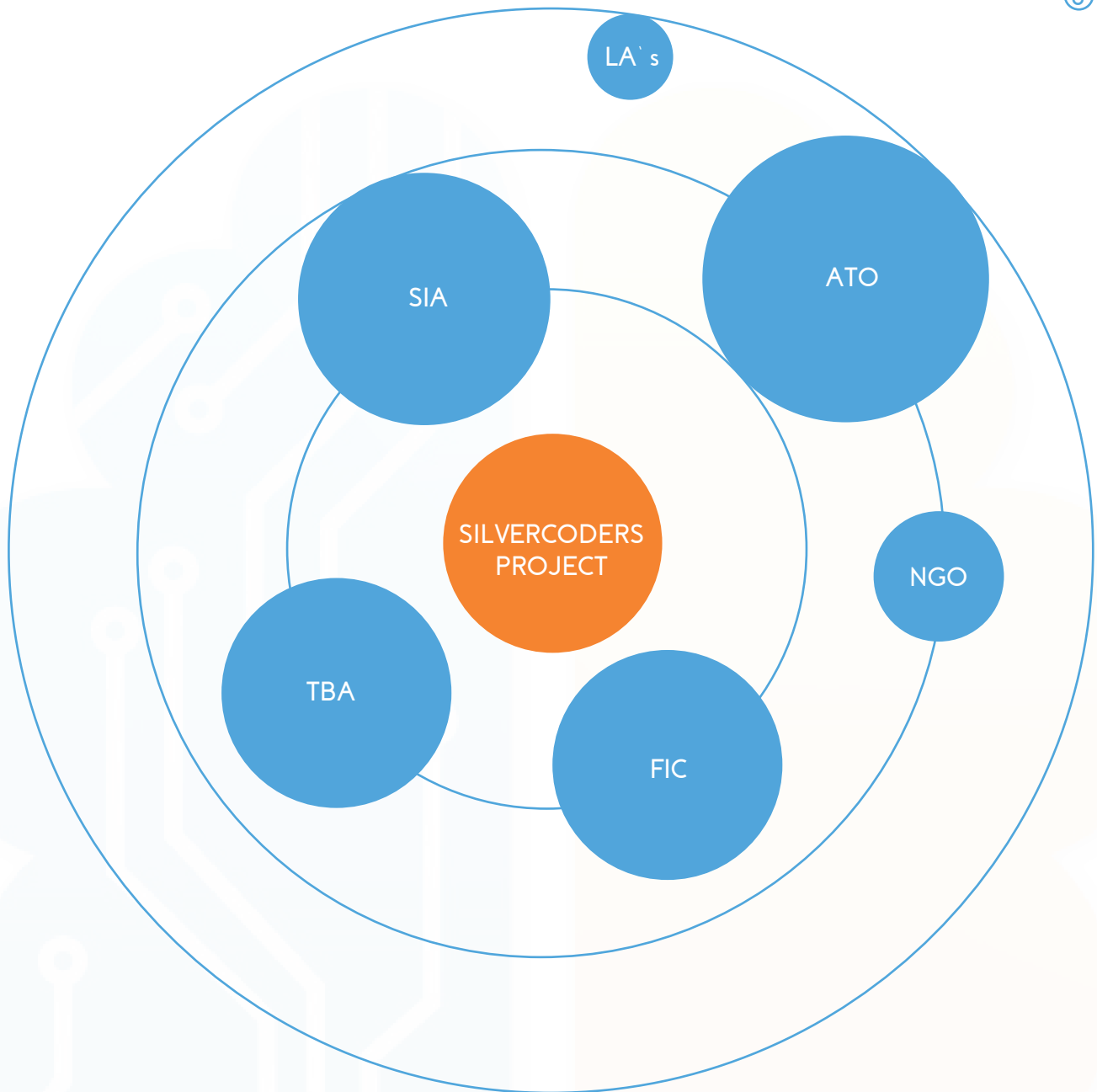
SIZE:
Skateholder's positive influence on the project (small/medium/large size).

DISTANCE:
Project's positive influence on the skateholder.

LEGEND:

Adult training organizations (ATO)
Territorial business associations (TBA)
Local public administrations and policymakers (LAs)

Senior informal associations (SIA)
NGOs. foundations. and associations (NGO)
Formal and informal caregivers (FIC)

COMPETENCIES

The SILVERCODERS framework addresses two types of competencies:

- General digital competencies.
- Programming-related digital competencies.

General digital competencies are not specific to programming and cover all the aspects a citizen today has to know to evolve in the digital world. Those competencies will be covered by a few of the SILVERCODERS challenges. but will mainly be worked on and acquired in a transversal manner. as they will be called upon and needed in the practice of acquiring programming related digital competencies. Programming-related competencies are learning objectives that cover a very specific coding concept. Those concepts range from basic to advanced ones and will be covered by the SILVERCODERS challenges in a progressing fashion. each piece of knowledge opening the way to the understanding and acquiring of the next one.

The following general competencies are covered by the SILVERCODERS framework:

TYPE OF COMPETENCY	DETAILED LIST
1. Information and data literacy	1.1. Browsing. searching and filtering data. information and digital content
	1.2. Evaluating data. information and digital content
	1.3. Managing data. information and digital content
2. Communication and collaboration	2.1. Interacting through digital technologies
	2.2. Sharing through digital technologies
	2.3. Engaging in citizenship through digital technologies
	2.4. Collaborating through digital technologies
	2.5. Netiquette
	2.6. Managing digital identity

3. Digital content creation	3.1. Developing digital content
	3.2. Integrating and re-elaborating digital content
	3.3. Copyright and licences

4. Safety	4.1. Protecting devices
	4.2. Protecting personal data and privacy
	4.3. Protecting health and well-being
	4.4. Protecting the environment

5. Problem solving	5.1. Solving technical problems
	5.2. Identifying needs and technological responses
	5.3. Creatively using digital technologies
	5.4. Identifying digital competence gaps

The following list of coding and programming competencies are covered by the SILVERCODERS framework:

TYPE OF COMPETENCY	DETAILED LIST
1. Programming Languages and Platforms	1.1. Compilers and Tools
	1.2. Low and High level languages
	1.3. Visual Programming
	1.4. No code Programming
2. Expressions and Statements	2.1. Command Lines
	2.2. Syntax
	2.3. Operators
	2.4. Input and Output
	2.5. Comments
3. Variables	3.1. Variables
	3.2. Constants
	3.3. Reserved Words
4. Mathematical operations	4.1. Basic Operations
	4.2. Trigonometry
	4.3. Advanced Operations
	4.4. Random

5. Data Structures	5.1. Numbers
	5.2. Strings
	5.3. Lists
	5.4. Arrays
	5.5. Media

6. Control Structures	6.1. Functions
	6.2. Conditionals
	6.3. Loops

7. Object Oriented Programming Concepts	7.1. Object Oriented Languages
	7.2. Objects and Classes

8. Debugging	8.1. Debugging Tools
	8.2. Debugging Methodologies

⑪

LEARNING STRATEGY

The selected competences were organized in eight modules with the following organization:

MODULE	COMPETENCES
1. Basic digital literacy	Information and data literacy
	Communication and collaboration
	Safety
2. No-code app creation	Information and data literacy
	Digital content creation
3. Digital content creation	Digital content creation
4. Programming and coding	Programming Languages and Platforms
	Expressions and Statements
	Variables
	Mathematical operations
5. Data Structures	Data Structures
6. Control structures	Control Structures
7. Advanced coding	Object Oriented Programming Concepts
	Debugging
8. Problem solving	Problem solving

The SILVERCODERS Learning Strategy is based on the following elements:

ELEMENT	PURPOSE
Classroom sessions	Presentation of concepts.
	Supported practice.
	Scheduled group activities.
Autonomous learning	Autonomous practice.
	Unscheduled individual activities.
Video-lectures, demonstrations or simulations	Presentation of concepts.
	Can support autonomous learning or classroom sessions.
Half-baked scenarios or challenges	Practice activities.
	Can support autonomous learning or classroom sessions.
Assessment	Self-assessment activities.

The SILVERCODERS Learning Strategy adopts a blended-learning approach with the following organization:

ELEMENT	PURPOSE
Workload	4-8 hours per week
Module	1 module per week
Classroom sessions	1 or 2 2-hour session per week
Autonomous learning	2-6 hours per week
Video-lectures, demonstrations or simulations	2-4 video-lectures/demos per module
Half-baked scenarios or challenges	4 challenges per module
Assessment	4 self-assessment activities per module
	1 assessment activity per module