Pedagogical Framework

INCLAVI (INCLUSIVE AVIATION)

Prepared by - Haaga-Helia University of Applied Sciences

Project	INCLAVI Inclusive Aviation
Project number	101056389
WP	WP3: Curriculum Development and Piloting
Deliverable number and name	D3.3 Pedagogical Framework
Nature of document	Report
Due date, completed deliverable	31st October 2024
Responsible partner	Haaga-Helia University of Applied Sciences
Status	Final
Authors	Haaga-Helia University of Applied Sciences
Reviewers	BUAS, Haaga-Helia, Istanbul Grand Airport, Özyeğin University
Reviewer(s) whole deliverable	BUAS, Haaga-Helia, Istanbul Grand Airport
Deliverable Type	R, Document, report
Dissemination Level	Public

INCLAVI D3.3 Report on Pedagogical Framework

D3.3 Report on Pedagogical Framework Description in participating languages

English: This report summarises the pedagogical framework that is meant to guide the development of INCLAVI curriculum. The report sets the principles behind learning objectives, content creation, and assessment methodology formulated for INCLAVI modules, as well as the instructional style that is focused on student-centred and self-guided online learning, compatible with integration in a classroom environment. Additionally, principles of accessible education and personalised learning paths, coupled with mobile application interface have been considered.

Dutch: Dit rapport vat het pedagogisch kader samen van het INCLAVI-curriculum. Het rapport beschrijft de criteria voor vaststellen van leerdoelen, inhoud en de toetsmethoden van de INCLAVI-modules.Ook wordt de didactiek beschreven, die uitgaat van studentgericht en zelfgestuurd online leren, en kan worden geïntegreerd in een fysieke klaslokaal -omgeving. Daarnaast zijn principes van toegankelijk onderwijs en gepersonaliseerde leertrajecten beschreven en de wijze waarop de mobiele applicatie-interface kan worden toegepast.

Finnish: Tämä raportti tiivistää pedagogisen viitekehyksen, jonka on tarkoitus ohjata INCLAVI-opetussuunnitelman kehittämistä. Raportissa määritellään INCLAVI-moduuleille laadittujen oppimistavoitteiden, sisällöntuotannon ja arviointimenetelmien taustalla olevat periaatteet sekä opetustyyli, joka keskittyy opiskelijakeskeiseen ja itseohjautuvaan verkko-oppimiseen, joka on yhteensopiva luokkahuoneympäristöön integroinnin kanssa. Lisäksi on huomioitu saavutettavan koulutuksen ja yksilöllisten oppimispolkujen periaatteet yhdistettynä mobiilisovellukseen.

Spanish: Este informe resume el marco pedagógico que pretende guiar el desarrollo del plan de estudios INCLAVI. El informe establece los principios detrás de los objetivos de aprendizaje, la creación de contenido y la metodología de evaluación formulada para los módulos de INCLAVI, así como el estilo de instrucción que se centra en el aprendizaje en línea autoguiado y centrado en el estudiante, compatible con la integración en el entorno del aula. Además, se han tenido en cuenta los principios de educación accesible y las rutas de aprendizaje personalizadas, junto con la interfaz de la aplicación móvil.

Turkish: Bu rapor INCLAVI müfredatının geliştirilmesine rehberlik etmesi amaçlanan pedagojik çerçeveyi özetlemektedir. Rapor, INCLAVI modülleri için formüle edilen öğrenme hedeflerinin, içerik oluşturmanın ve değerlendirme metodolojisinin yanı sıra sınıf ortamında entegrasyonla uyumlu, öğrenci merkezli ve kendi kendine rehberlik eden çevrimiçi öğrenmeye odaklanan öğretim stilinin arkasındaki ilkeleri belirler. Ayrıca erişilebilir eğitim ilkeleri ve kişiselleştirilmiş öğrenme yolları ile mobil uygulama arayüzü de dikkate alınmıştır.

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1   Introduction

1.1   Purpose of the document

This framework provides a comprehensive approach to designing an online learning programme that engages learners, supporting their learning needs, and ensures they achieve the intended learning outcomes. Each module follows a structured path from introduction to assessment, with a focus on interaction, application, and continuous improvement.

1.2   Terminology

According to the UN convention on the rights of persons with disabilities, persons with disabilities *"… include those who have long-term physical, mental, intellectual or sensory impairments which in interaction with various barriers may hinder their full and effective participation in society on an equal basis with others*." (The Convention on the Rights of Persons with Disabilities and its Optional Protocol A/RES/61/106)[1]

The EU regulation (EC) no 1107/2006 of the European parliament and of the council of 5 July 2006[2] concerning the rights of disabled persons and persons with reduced mobility when travelling by air defines disabled person and person with reduced mobility as: "*'disabled person' or 'person with reduced mobility' means any person whose mobility when using transport is reduced due to any physical disability (sensory or locomotor, permanent or temporary), intellectual disability or impairment, or any other cause of disability, or age, and whose situation needs appropriate attention and the adaptation to his or her particular needs of the service made available to all passengers*"

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[1] https://social.desa.un.org/issues/disability/crpd/convention-on-the-rights-of-persons-with-disabilities-crpd
[2] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32006R1107

IATA defines persons with reduced mobility in the 2023 IATA Guidance on the Transport of Mobility Aids as "*any person whose mobility is reduced due to physical disability (locomotory or sensory) intellectual impairment, age, illness or any other cause of disability and who needs some degree of special accommodation or assistance over and above that provided to other passengers[3].*"

For the purposes of this deliverable, the term **PRM** will be used to include all persons with disabilities and persons with reduced mobility as per all above definitions.

2   Background of the INCLAVI learning framework

Accessibility and inclusion are essential constructs which enable the independent participation of Persons with Disabilities (PwDs), for example, in tourism and at the same time benefit a wide range of persons with specific access requirements, including seniors, families with small children, those with long-term health conditions and others, who travel for leisure, for business or for education. PwDs and PRMs face barriers that prevent them from accessing equal opportunities for air travel (Eur-Lex, 2006; European Accessibility Act; Convention on the Rights of Persons with Disabilities).

The customer journey in aviation for PRM is complex and uneven and presents a myriad of gaps in the quality of customer experience. The aviation sector provides a wide range of services for Passengers with Reduced Mobility (PRMs) at airports and onboard flights covering a wide range of access needs and functional requirements of passengers who require assistance of various kinds.

To bridge the gaps there needs to be a solid understanding of the passenger journey. Following the onset of the COVID-19 pandemic, the

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[3] https://www.iata.org/contentassets/7b3762815ac44a10b83ccf5560c1b308/iata-guidance-on-the-transport-of-mobility-aids-final-feb2023.pdf

travel industry is encouraged to "build back better" with a clear message to give priority to inclusion, equity and diversity in the design of safe and accessible services and environments (UNWTO, 2020 "Inclusive Recovery Guide – Sociocultural Impacts of Covid-19, Issue I: Persons with Disabilities).

INCLAVI addresses the skills mismatches that exist in the aviation sector related to the freedom of movement of persons with disabilities in line with the EC Strategy for the Rights of Persons with Disabilities 2021-2030. Current training programmes that have a focus in PRMs whether in the industry, within HEI educational curricula or VET training systems, either do not exist or are too narrowly focused on a specific disability only, failing to consider the entire passenger journey of PRMs incorporating a wide spectrum of access needs.

A single journey involves multiple companies, such as airlines, airports, ground handling companies and other service providers. Since each unit creates its own training materials with varying content and levels of inclusivity, this inconsistency impacts the overall travel experience of PRMs. Many frontline employees throughout the journey are often busy with operations, so it is crucial to provide easily accessible training methods that capture their attention, such as videos, photos. Offering consistent training across all units ensures that people with disabilities receive a seamless and holistic experience, as staff from different companies will share the same awareness and sensitivity.

INCLAVI will address these challenges by offering comprehensive training modules supported by various learning materials. The modules will also be available as a mobile app, mirroring the format of the website, allowing users to easily access the training, continue from where they left off, and track their learning progress.

INCLAVI will design and co-create a new training curriculum utilising expertise from HEI, VET and Industry Actors to support the reskilling of aviation sector employees and key target groups who have a role in the passenger journey of PRMs from door to door. The training will address

students and professionals in areas of work related to travel agencies, airports, and airlines.

3   Pedagogical framework overview

3.1   Definition of pedagogical framework

A pedagogical framework is a structured approach or model that guides the design, implementation, and evaluation of educational activities. It provides a systematic way to organize the teaching and learning process, ensuring that educational goals are met effectively. Pedagogical frameworks are often used by educators, instructional designers, and curriculum developers to create coherent and meaningful learning experiences for students.

A pedagogical framework provides a roadmap for educators to design meaningful learning experiences that engage students, promote deep understanding, and foster lifelong learning skills. It serves as a guide for aligning instructional goals with teaching strategies, assessment methods, and student support mechanisms to create an effective and impactful learning environment

3.2   Importance of pedagogy in the INCLAVI learning framework

The INCLAVI pedagogical framework outlines the used approaches as well as gives practical advice on how to foster soft and digital skills alongside inclusiveness knowledge and skills in the INCLAVI training program.

The overarching purpose is to increase learners' preparedness for the challenges of the rapidly evolving field of aviation especially from the viewpoint of inclusive, accessible travel opportunities, customer service and passenger journeys. INCLAVI promotes instructional approaches where the learners are active participants and owners in their learning process rather than being just passive recipients.

The pedagogical approach aims to expand learning beyond the boundaries of the application itself and to instil a culture and mindset of continuous learning within real world contexts. It also aims to complement the learner's disciplinary knowledge of, for example, gate service, customer service, ground handling, etc. by acquiring and applying inclusion related skills and knowledge alongside soft skills. Soft skills to be addressed through the programme are for example but not limited to the ability to contextualise the learner's disciplinary knowledge, complex problem-solving skills, ability to collaborate and the learning to learn ability. The pedagogical approach meets the needs of diverse learner populations some of which are HEI students, VET students and on-the-job learners. Some of the learners will also be learning in their non-native language. As a result, there is a strong need to emphasise a coherent pedagogical approach.

The INCLAVI pedagogy has a strong emphasis on Inquiry-Based Learning and Problem-Based Learning. Both are student-centred approaches to education that emphasize active engagement, critical thinking, and exploration. Even though the materials in the programme are online, it encourages exploration and connecting the material to real world problems and challenges. Moreover, using INCLAVI as part of an online or face-to-face group setting lends itself well for social constructivist learning using these approaches.

3.3   Goals of the pedagogical framework

A pedagogical framework for the INCLAVI module-based online learning programme provides a structured approach to designing, delivering, and evaluating the online modules. It helps educators ensure that the learning objectives are met, the content is engaging, and the students and professionals are supported throughout their learning journey.

The INCLAVI pedagogical framework adopts Biggs' (2003) idea of constructive alignment. 'Constructive alignment' begins with the idea

that learners actively build their understanding through engaging in relevant learning activities. The role of the teacher is to design a supportive learning environment that facilitates these activities towards the intended learning outcomes. The crucial aspect lies in the harmony among all elements of the educational system - including the curriculum's objectives, the methods of instruction employed, and the assessment tasks. Each component is finely tuned to the learning activities essential for achieving the desired outcomes. This seamless integration makes it challenging for learners to not engage meaningfully with the material, ensuring a pathway to effective learning.
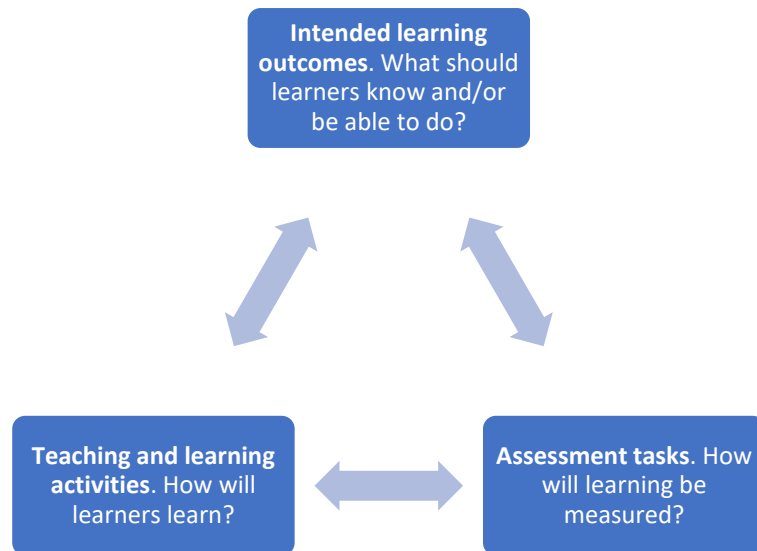
Figure 1: Elements of the learning system (adapted from Biggs 2003)

4 Learning objectives and outcomes

4.1 Definition and importance

Learning objectives are clear, concise statements that describe what learners are expected to achieve after completing a learning activity, module, course, or program. They outline specific, measurable, and achievable goals that guide the design, delivery, and assessment of educational experiences.

In essence, learning objectives define the desired outcomes of learning. They provide a roadmap for educators and learners alike, helping to focus teaching efforts, set expectations, and assess progress. Effective learning objectives are often SMART: Specific, Measurable, Achievable, Relevant, and Time-bound.

- Specific: Learning objectives should be precise and unambiguous, clearly stating what learners will know, understand, or be able to do.

- Measurable: Objectives should be quantifiable, allowing for the assessment of whether the learning goal has been achieved. This often involves using observable actions or behaviours as evidence of learning.

- Achievable: Objectives should be realistic and attainable within the given context, resources, and timeframe.

- Relevant: Learning objectives should align closely with the content, context, and goals of the educational program or activity. They should address the knowledge, skills, or competencies that are most important for learners.

- Time-bound: Objectives should include a timeframe or deadline by which the learning should be accomplished. This helps to create a sense of urgency and focus.

Learning objectives serve several different purposes. Firstly, they guide instruction. Learning objectives provide educators with a clear roadmap for designing and delivering instruction. They help instructors prioritise content, activities, and assessments to ensure that learners achieve the desired outcomes.

Learning objectives additionally set expectations. Learning objectives communicate to learners what is expected of them in terms of knowledge acquisition, skill development, or behaviour change. This clarity can enhance motivation and engagement.

Learning objectives serve as criteria for evaluating learner performance. Educators can use them to design assessments that directly measure whether learners have met the stated goals.

Lastly, learning objectives support continuous improvement. By assessing whether learning objectives have been met, educators can identify areas of strength and areas needing improvement in the instructional design. This feedback loop supports ongoing refinement and enhancement of the learning experience.

In summary, learning objectives are foundational elements of educational design, providing a roadmap for both educators and learners. They clarify expectations, guide instruction, facilitate assessment, and ultimately, contribute to the achievement of desired learning outcomes.

4.2   Specified INCLAVI learning objectives and outcomes

The INCLAVI learning objectives are built upon Bloom's taxonomy.

After completing the INCLAVI learning programme

1. Learners will be able to recognize air passengers with reduced mobility (PRMs) or other special access requirements.
2. Learners will be able to define the major components of respectful behaviour and attitude towards passengers with reduced mobility (PRMs) or with other special access requirements
3. Learners will be able to explain the differences and interrelations among different reasons and types of conditions that lead to reduced mobility, some of which can be disabilities and health conditions.
4. Learners will be able to identify the user requirements related to different types of disabilities and implement strategies to overcome obstacles in the passenger journey of the PRMs.

5. Learners will be able to accommodate the passenger journey (from booking to leaving the airport) of passengers with reduced mobility to improve and enhance their travel experience.

6. Learners will be able to create an inclusive customer journey that provides a positive travel experience for the PRMs while fulfilling operational and legal requirements.

Creating (using information to create something new)

Evaluating (examining information and making judgements)

Analyzing (taking apart the known and ientifying relationships)

Applying (using information in a new but similar context)

Understanding (grasping the meaning)
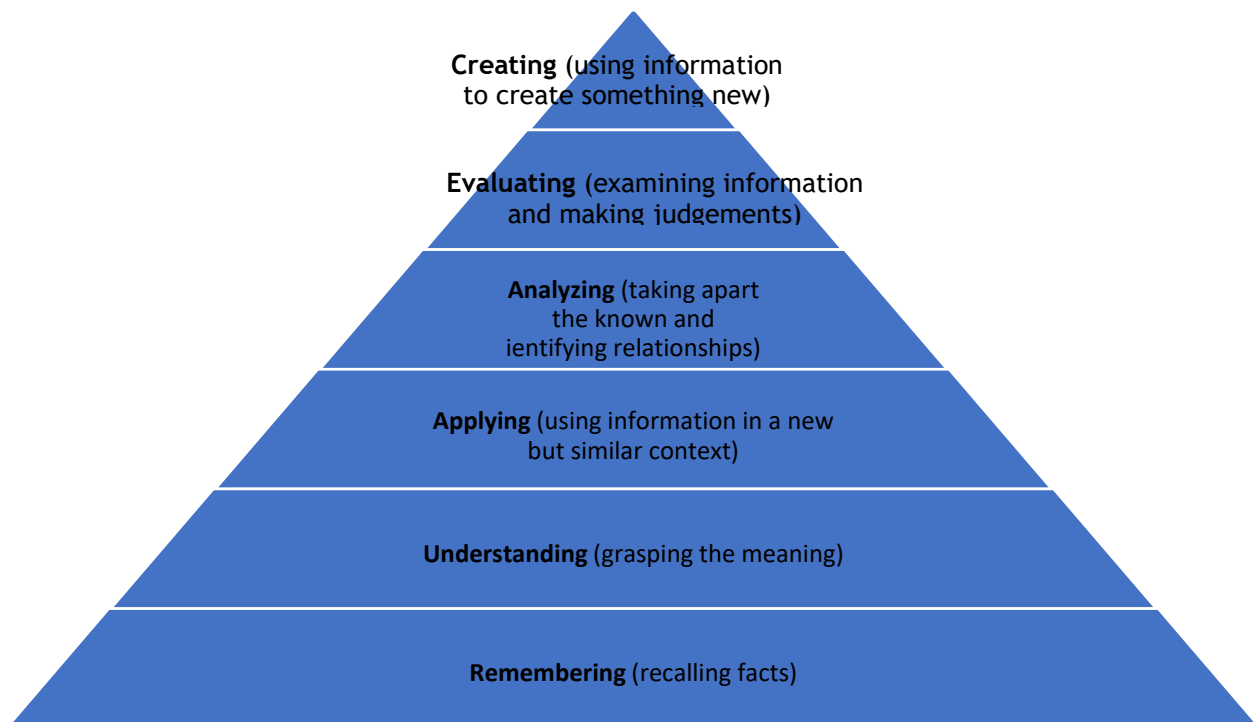
Remembering (recalling facts)

Figure 2: Bloom's taxonomy (adapted from Krathwohl 2002)

An additional and long-term objective of the INCLAVI training programme is to increase the capacity of adaptation within the aviation industry, which is crucial for business continuity in times of change. Adaptive capacity relates to the capacity of systems, institutions,

humans and other organisms to adjust to potential damage, to take advantage of opportunities, or to respond to consequences. In the context of related socio-ecological social systems, adaptive capacity is commonly associated with the ability of institutions and networks to learn, and store knowledge and experience as well as with creative flexibility in decision making, transitioning and problem solving.

INCLAVI caters to three different levels of learners, beginner, intermediate and advanced. Beginner level refers to the "remembering" and "understanding" levels in the Bloom taxonomy; Intermediate refer to "applying" and "analysing" and Advanced refer to "evaluating" and "creating". The INCLAVI learning objectives suit the different levels roughly as in Table 1.

Table 1: INCLAVI programme learning objectives set against learner levels and Bloom's taxonomy.

Learner's beginning level	Blooms taxonomy level	INCLAVI objectives
Beginner	Remembering	Learners will be able to recognize air passengers with reduced mobility (PRMs) or other special access requirements.
	Understanding	Learners will be able to define the major components of respectful behaviour and attitude towards passengers with reduced mobility (PRMs) or with other special access requirements
Intermediate	Applying	Learners will be able to explain the differences and interrelations among different reasons and types of conditions that leading to reduced mobility, some of which can be disabilities and health conditions.
	Analysing	Learners will be able to evaluate the different types of disabilities and implement strategies

		to overcome obstacles in the passenger journey of the PRMs.
Advanced	Evaluating	Learners will be able to accommodate the passenger journey (from booking to leaving the airport) of passengers with reduced mobility to improve and enhance their travel experience. Learners will be able to create an inclusive customer journey that provides a positive travel experience for the PRMs while fulfilling operational and legal requirements.

Each module in INCLAVI will have its own learning objectives for each of the three learner starting competence levels; i.e. beginner, intermediate and advanced levels. Learners at all levels can be both students and industry professionals and both target groups use the same INCLAVI training programme according to the learner's own personal starting level. Some modules will, however, only be offered at one or two levels depending on the content type.

4.3 Alignment with curriculum standards and certification

Micro-credentials, also known as digital badges or nano-degrees, are credentials awarded to individuals upon the completion of a small, focused, and often specific set of learning experiences. Micro-credentials are a key element of the INCLAVI training programme. Micro-credentials offer a flexible, accessible, and targeted approach to learning, allowing individuals to acquire valuable skills and credentials that are tailored to their interests and career goals. They provide a pathway for continuous learning and professional growth in an ever-evolving job market.

The INCLAVI micro-credentials are stackable meaning that learners can earn multiple micro-credentials over time, gradually building a portfolio of skills and competencies. These credentials can be accumulated

towards a larger qualification, such as a certificate, diploma, or even a degree. HEIs and VETs recognize INCLAVI micro-credentials according to their own criteria for the recognition of prior learning.

INCLAVI micro-credentials can be certified. The recommendation from the pedagogical framework's perspective is that the learner's progress can be certified at all three different competence levels: beginner, intermediate and advanced. As a result, the learner could earn up to three certified micro-credentials for one module if they undertake and pass the module at all three different competence levels. However, some modules only cater to one or two learner levels, not all three.

The INCLAVI training programme has been built upon key European learning instruments. These are summarized as follows:

EQF – European Qualification Framework

The curriculum and training material are designed to meet or exceed European Qualification Framework level 4, 5 or 6 criteria. The European qualifications framework (EQF) is a common European reference framework which ensures that our curriculum and training material is more readable and understandable across different countries and systems. The Level 6 refers to the level expected of bachelor level degrees in European HEIs, whereas Levels 5 and 4 are more suitable to the VET environment representing nonetheless comprehensive and specialised factual knowledge and a comprehensive range of skills to develop solutions to problems.

ECTS – European Credit Transfer and Accumulation System

The individual HEIs in this project will include the training material into their curriculum and then award ECTS (European Credit Transfer and Accumulation System) points to students upon successful completion of training. A certificate of completion will also be provided by faculty members. This will occur only after demonstration of learning outcomes (knowledge, skills and/or competences) via an assessment within the learning platform. The learning objectives, activities,

assessments, and validation of learning outcomes will be established before piloting.

ESCO- European Standard Classification of Occupations

The INCLAVI Curriculum on Inclusive Aviation and resulting qualifications will align with the European Qualifications Framework EQF as well as the ESCO classification of European Standard Classification of Occupations and will also be aligned with and for use in Europass.

EQAVET - European Quality Assurance in Vocational Education and Training

INCLAVI has a Finnish VET partner leading WP5 Quality assurance and evaluation and will ensure that the results of the curriculum are in line with the key EU instruments related to EU skills.

EPSO's competency framework

EPSO has been using a competency framework since 2010, consisting of 8 general competencies. This was renewed and the new competency framework started being used in 2023. The Competency Framework defines the competencies that are considered essential to perform effectively in any given job, although the original connection is to EU institutions and bodies that EPSO serves.

The competencies are:

1. Critical thinking, analysing & creative problem-solving
2. Decision-making & getting results
3. Information management (digital and data literacy)
4. Self-management
5. Working together
6. Learning as a skill
7. Communication
8. Intrapreneurship

INCLAVI considers these competencies, and they are used as a guideline in creating the training program. However, since INCLAVI is a short program and provided mostly online, these competencies are not the central element and are not purposefully fostered. INCLAVI bears most relevance to competencies 1-3.

5   Instructional strategies and design principles

Instructional strategies refer to various teaching approaches that educators employ to enhance student learning and comprehension of subject matter. These methods are designed to create an engaging and meaningful learning environment, motivating students to take an active role in their education. By using these strategies, the main objective is to cultivate independent, strategic learners. The aim is that, with repeated practice and exposure, students will learn to recognize and apply the most suitable techniques themselves, equipping them to handle academic challenges with confidence. (Persaud 2024)

There are numerous examples of instructional strategies, applicable across various academic levels and subjects, and accommodating a broad spectrum of learning styles. These strategies play a crucial role in motivating learners, enhancing engagement, capturing attention, and fostering a deep and lasting comprehension of the material.

Given the vast number and diversity of instructional strategies, it is impossible to list them all. However, the following categories provide a snapshot of the main types, though they do not cover the entire range: active learning, assessment-based approaches, collaborative methods, advanced techniques, organizational (or classroom management) strategies, and tiered interventions.

Design principles for the INCLAVI training include ensuring that the content is accessible to all potential learners, who may have disabilities related to mobility, dexterity, visual or hearing impairments. As an

online training course, INCLAVI will be designed to conform with the Web Content Accessibility Guidelines (WCAG) AA version 2.2.

5.1   Understanding the target audience

There are two distinct learner groups for INCLAVI. Firstly, it includes managers and staff of globally oriented aviation industry stakeholders such as airports, airlines and other aviation service providers with customer and legislative pressure to provide inclusive services. These professionals and current employees within the aviation sector are experiencing skills gaps and mismatches with respect to inclusive aviation.

The second learner group includes staff and students of European institutions of higher and vocational education who are training or being educated as the next generation of aviation professionals.

Additionally, INCLAVI can be provided as a "train-the-trainer" programme with instruction.

The learner group of current professionals will acquire new urgently needed skills within inclusive air travel as well as update their set of digital learning, self-development and workflow related digital skills. The new skills will open new professional pathways and lead to increased employability. The programme will lead to an increased awareness of disabilities, hidden access needs as well as inclusive service provision, which in turn leads to their greater appreciation. Being able to serve passengers with specific access requirements equally and with dignity as well as acquiring new skills can lead to greater job satisfaction and motivation.

Teachers, staff and students at European HEIs, VETS and other institutions will use INCLAVI to increase their knowledge and competencies in inclusive aviation. This will increase the students' employability as these skills are both highly needed and under-

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represented currently and thus in vast demand. Teachers will be able to add INCLAVI into their curricula and thus stay abreast of the current business demands. HEIs and VETs can use the project outcomes to renew higher education in line with the European Renewed Higher Education Agenda and the European Education Area.

Aviation industry stakeholders can use the training package also to train their staff in process and business development functions on the content as well as business potential within inclusive aviation. Front-line operational staff are crucial as they need to apply theoretical knowledge in practice the most. Trainers can incorporate scenario-based training and real-world case studies within the INCLAVI modules to help staff effectively apply these concepts.

As a result, the companies will create new modus operandi when catering for PRMs, leading to enhanced cost management and more streamlined business processes. The results will also lead to recognition of new business models and potential for competitive advantage helping the companies become increasingly more competitive, resilient and future fit. The increased understanding and learning on PRMs can also lead to new innovations and intra- as well as cross-industrial entrepreneurship within the area of inclusive aviation, for example new bundles of services including check-in, ground assistance, boarding, in-flight, luggage and arrivals.

5.2   Designing engaging and interactive content

Designing engaging and interactive content for INCLAVI means merging educational objectives with user-centred design principles. The aim is to create an immersive digital environment that not only delivers knowledge but also captivates and motivates learners throughout their educational journey.

Passive learning experiences can often lead to disengagement. By incorporating interactive elements such as quizzes, simulations, games,

and multimedia, learners are encouraged to actively participate in the learning process. For instance, the training program might include interactive exercises where users can practice terminology through drag-and-drop activities or voice recognition exercises.

Clear, simple and accessible navigation, concise instructions, and visually appealing design contribute to a seamless learning experience. Users should be able to easily access different sections of INCLAVI, track their progress, and receive timely feedback on their performance. Gamification elements, such as progress feedback, badges, and rewards, can further enhance user engagement by adding a sense of achievement and accomplishment.

Additionally, personalization plays a crucial role in creating engaging content. Adaptive learning algorithms can analyse user behaviour and performance data to deliver customised learning paths. This ensures that learners receive content tailored to their individual strengths, weaknesses, and learning pace. By offering personalised recommendations, the app becomes more relevant and valuable to users, motivating them to continue their learning journey. INCLAVI provides learners the ability to tailor contents according to their prior competence level as well as to use a three-tier tag system to search for relevant content based on competence level, disability type as well as passenger journey section.

5.3   Collaboration and social learning

Collaboration and social learning refer to the ways in which learners engage with each other, either in person or virtually, to construct knowledge and understanding. These approaches recognise that learning is often a social process, where individuals can benefit from interacting, sharing ideas, and working together towards common goals. INCLAVI can incorporate social learning when used in a blended learning environment. As trainers engage with learners in person, they

can utilise role-playing scenarios from the modules. This method particularly enhances learners' ability to apply concepts in real-world contexts, allowing them to practice and refine their skills while fostering deeper understanding.

The INCLAVI curriculum and training programme can be used as an element in a regular class at HEIs and VETs. Ideally, the training programme can be used as an assignment or a flipped classroom preparation exercise for example. In these cases, it is strongly advised to incorporate collaboration and social learning into the class structure in addition to the INCLAVI programme and recognise the value of social interactions in the learning process. These approaches not only enhance academic outcomes but also foster important skills such as communication, teamwork, empathy, and cultural competence. By creating opportunities for students to engage with each other in meaningful ways, educators can cultivate a dynamic and enriching learning environment that prepares learners for success in a diverse and interconnected world.

Collaboration in a pedagogical context involves learners actively working together on a shared task or project. This could take various forms, such as group assignments, joint research projects, or problem-solving activities. The goal is for learners to pool their knowledge, skills, and perspectives to achieve a common objective. Through collaboration, learners not only deepen their understanding of the subject matter but also develop important interpersonal skills such as communication, teamwork, and negotiation.

Social learning emphasizes the idea that learning occurs through observing, imitating, and interacting with others. In a pedagogical context, social learning recognizes the influence of peers, instructors, and the broader social environment on an individual's learning process. Social learning can take place both in formal educational settings, such as classrooms, and informal settings, such as online forums or communities of practice. It involves activities such as peer tutoring, group discussions, mentorship programmes, and collaborative projects.

Through social interactions, learners have an opportunity to gain new perspectives, receive feedback, and refine their understanding of concepts.

The INCLAVI training programme is built to serve diverse needs of learners in different geographies and with very different circumstances. The key element of the programme is the ability to advance at the learner´s own pace. As a result, the online training programme does not cater to collaborative and social learning at this point. However, if and when user amounts significantly increase, such elements can be added. Modern learning management systems have transformed social learning, providing avenues for learners to connect, share resources, and participate in virtual communities. These digital spaces facilitate the exchange of ideas, the co-creation of knowledge, and the building of networks that extend beyond traditional classroom boundaries.

5.4   Fostering intrinsic motivation

Fostering intrinsic motivation within INCLAVI involves creating an environment that encourages learners to engage with the material driven by their inherent curiosity and interest. It involves creating a dynamic, relevant, and supportive learning environment. By emphasising real-world applications, providing autonomy, nurturing a sense of community, offering constructive feedback, and integrating gamification elements, INCLAVI can inspire learners to become passionate advocates for inclusivity within the aviation industry. Ultimately, intrinsic motivation not only enhances the learning experience but also empowers individuals to drive positive change and innovation in the field of aviation. The INCLAVI mobile application can also enhance motivation and sustainability by sending notifications to remind users of specific information and encouraging them to track their progress. This section looks at the keyways in which INCLAVI fosters intrinsic motivation.

Firstly, relevance and real-world applications are key. Connecting the concepts of accessible, inclusive aviation to tangible, practical examples help learners see the direct impact of their knowledge. Case studies, success stories of inclusive aviation initiatives, and interviews with industry professionals can all provide valuable context, illustrating how the principles they are learning are actively shaping the aviation sector.

Secondly, fostering a sense of autonomy empowers learners to take ownership of their learning journey. Providing opportunities for learners to set their goals, choose their learning paths, and explore topics of personal interest within the realm of inclusive aviation can significantly enhance motivation.

Another effective strategy is to provide constructive feedback and recognition for learners' progress. Positive reinforcement, acknowledgment of achievements, and celebrating milestones can reinforce the value of their efforts. This could include digital badges, certificates of completion, or opportunities to showcase their knowledge through virtual presentations or projects.

Additionally, incorporating gamification elements can add an element of fun and challenge to the learning experience. Leaderboards, quizzes, and virtual simulations can make the learning process more interactive and engaging, motivating learners to progress and achieve higher levels of mastery.

6 Content organisation

All of the INCLAVI modules will follow a similar content structure for coherence and ease of learning and understanding. Each module will start with an introduction. The introduction will serve to gain attention of the learners mostly in the form of a short video on the topic. In addition, the introduction will have an empathy story showcasing the actual situation faced by PRMs. The empathy story facilitates understanding and is a tool used in service design, but it also

strengthens attention. The introduction will also introduce the module specific learning objectives for the different levels of learners.

The core of the modules is the learning content itself. This can take several different forms, i.e. interactive presentations, videos, texts, audio or visuals. Different content delivery types will ensure learners with different learning styles can access the content effectively. The learning content will also be provided as a summary. The summary can be in alternative formats: text-based, visual or audio.

All modules will have a section dedicated to recommendations for further learning and immersion in the topic. These can be updated regularly to provide the latest information on the themes.

All modules will have built-in assessment. The assessment can and will be done with different, varying suitable methodologies. Assessment can also be tied to the learner's prior level of competence so that he/she can take the assessment according to his/her own level and for example re-do the module and assessment later as the competence level increases.

6.1 Content organisation and search through INCLAVI internal tag system

In order to facilitate the module management and especially the navigation by the learner, a tag system has been created, containing the following tag groups: i) Learning Level from Table 1; ii) the type of disability; and iii) the air passenger journey touch points.

Table 2: INCLAVI tag system

Tag group	Type
Learning Level	Beginner, Intermediate and Advanced

Disability Type (based on ICAO, 2013, see Table 3.)	PSHL, MENTAL, COGNITIVE, MOBILITY-Aids, MOBILITY-DS, DEAF, VISUAL, SPEECH, w-ASSISTANT, w-ANIMAL
Passenger journey touch point	Shop & Purchase; Prepare to travel; To airport, Airport experience, In-flight, Airport arrival

United Nations defines "Persons with disabilities include those who have long-term physical, mental, intellectual or sensory impairments which in interaction with various barriers may hinder their full and effective participation in society on an equal basis with others." (UNCRPD, 2006[4])

When referring to Persons with Disabilities (PwDs) or persons with other specific access requirements when travelling by air, the term Persons with Reduced Mobility (PRMs) is commonly used. Table 3 typology of PwDs is based on the International Civil Aviation Organization (ICAO).

Table 3: Typologies of air passengers (PRMs) (Martín-Domingo et al., 2024) based on ICAO (2013).

ID	Typologies	Typology explanation
1	PSHL	Physical, sensory, hidden and learning disabilities
2	MENTAL	Mental health problems
3	COGNITIVE	Cognitive impairments

4	MOBILITY-Aids	Persons who use mobility aids
5	MOBILITY-DS	Persons with walking difficulties or limitations in balance, agility or coordination that affect their mobility
6	DEAF	Persons who are deaf or hard of hearing
7	VISUAL	Persons who are blind or partially sighted
8	SPEECH	Persons with impaired speech
9	w-ASSISTANT	Persons who require assistants and the roles of assistants
10	w-ANIMAL	Persons travelling with a service animal, and the role and needs of that animal

Table 4: Special Service Request (SSR) to airlines to provide a particular facility or service for a passenger or passengers. [5]

SSR code	Description
/ADTK	Advise if ticketed (PNR will be placed in queue **1**, category **6** of the responsible office)
*AVIH	Animal in hold (specify number, type and pedigree, and container weight and dimensions)
BIKE	Bicycle in hold, specify number (see below)
BLND	Blind passenger (specify whether or not accompanied by guide dog)
BSCT	Bassinet/carrycot/baby basket
*BULK	Bulky baggage (specify number, weight and dimensions)
CHLD	Child
*CKIN	Information for airport personnel
DBML	Diabetic meal
DEAF	Deaf passenger (specify if accompanied by a guide dog)
DEPA	Deportee, accompanied by an escort
DEPU	Deportee, unaccompanied
*DPNA	Disabled passenger with intellectual or development disability needing assistance
*ESAN	Passenger with emotional support/psychiatric assistance or animal in cabin
*EXST	Extra seat
*FRAG	Fragile baggage (specify number, weight and dimension)
FRAV	First available
*INFT	Infant (specify name and date of birth)
*LANG	Languages spoken
*MAAS	Meet and assist (specify details such as elderly person, handicapped passenger or pregnant lady)
MEDA	Medical case (it can be used for disabled passengers needing special attention: follow IATA MEDA procedure)
OTHS	Other service not specified by any other **SSR** code
PCTC	Emergency contact details for passenger
PETC	Animal in cabin (specify number, type and pedigree, and container weight and dimensions)
STCR	Stretcher passenger
SVAN	Passenger with service animal in cabin (**LH** specific)
*UMNR	Unaccompanied minor (specify age)
WCBD	Wheelchair - dry cell battery

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[5] List has been reduced to only include those SSR codes related to the PRM topic and excluding meals.

SSR code	Description
WCBW	Wheelchair - wet cell battery
WCHC	Wheelchair - all the way to seat
WCHR	Wheelchair - for ramp
WCHS	Wheelchair - up and down steps
WCMP	Wheelchair - manual power (US carriers only)
WCOB	Wheelchair - on board
*XBAG	Excess baggage (specify number, weight and dimensions)

Table 5: Stages of air passenger journey **(**Martín-Domingo et al., 2024) and adapted from IATA (2022:16)

Shop & Purchase	Prepare to travel	To Airport	Airport Experience	In-flight	Arrival and On-trip
Research flight Purchase flight	Research destination Book other services (for ex transport) Research PRMs info for airline Research PRMs info for airport Check in for flight	Transport Parking Irregular Operation (IROP)[6] early communication	Check bags Security Airport navigation Shop and dine Wait at gate	Boarding aircraft Entertainment Seating and aircraft configuration Refreshment and meals IROP mitigation Toilets	Disembarking aircraft Immigrations Connections Baggage claim Customs Transport

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[6] *IROP: Irregular Operations. "This Irregular Operations (IROPs) are identified by an airline or ground handler acting on behalf of an airline when a disruption on the day of travel or the day prior to travel causes the customer to not be able to use the flight(s) ticketed. An Irregular Operation (IROP) may be, but is not limited to, a flight delay, cancellation, diversion due to weather, mechanical problem, landing restriction, air traffic congestion, accident/aircraft damage, security concern, immigration issue, oversold flight, boarding delay, crew shortage or other staff issues." (IATA, 2020)*

7   Personalisation and adaptive learning

Personalisation and adaptive learning are innovative approaches to education that aim to tailor learning experiences to the specific needs, preferences, and abilities of each learner. In traditional classroom settings, educators face the challenge of accommodating diverse learning styles, paces, and interests within a single group of learners. Personalisation and adaptive learning technologies offer solutions to this challenge by leveraging the power of technology to create customised learning pathways for each learner.

Personalisation in education involves designing learning experiences that cater to the individual needs, interests, and abilities of learners. This approach recognises that learners come with unique backgrounds, strengths, and challenges, and seeks to provide them with learning opportunities that resonate with their experiences and motivations.

7.1   Customised learning paths and individualised learning experiences

Creating learning paths in an online modular learning environment involves strategically designing a sequence of learning modules tailored to meet diverse learner needs and goals. These paths leverage the flexibility of modular content, allowing learners to engage with the material at their own pace and according to their individual learning styles. Instructors can curate specific pathways that guide learners through fundamental concepts before advancing to more complex topics, ensuring a coherent and progressive learning experience. These will be designed as suggestions and examples within the pilot and testing phases of INCLAVI. This approach also facilitates personalized learning, as learners can select modules that align with their interests and career objectives. By integrating interactive elements, assessments, and real-world applications, these learning paths enhance engagement and knowledge retention, ultimately fostering a more effective and enriching educational journey.

Adaptive learning algorithms can analyse user behaviour and performance data to deliver customized learning paths. This ensures that learners receive content tailored to their individual strengths, weaknesses, and learning pace. By offering personalized recommendations, the app becomes more relevant and valuable to users, motivating them to continue their learning journey. INCLAVI provides learners the ability to tailor contents according to their prior competence level as well as to use a three-tier tag system to search for relevant content based on competence level, disability type as well as passenger journey section.

Learning paths also allow flexibility for the learner to generate their own library of competences. The INCLAVI curriculum provides for three different levels of learners, beginner, intermediate and advanced. There is no distinction between students or professionals in the industry since all roles can have all levels of competence with respect to the content provided in INCLAVI. All INCLAVI content has competence-based thinking and competence development behind. Modular structure, combined with three learner levels and the tag system, allows the creation of flexible personal learning paths.

8 Accessibility and inclusivity considerations

8.1 Designing for diverse learners

Designing learning content for diverse learners requires a thoughtful and inclusive approach that takes into account the wide range of backgrounds, abilities, and learning styles that learners bring to the table. It involves creating materials that are accessible, culturally relevant, and engaging for everyone, regardless of their functional abilities and diverse requirements. This means incorporating various formats such as visual aids, audio recordings, hands-on activities, and written materials to cater to different learning preferences and abilities. Additionally, providing multiple pathways for understanding and

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demonstrating knowledge ensures that all learners have the opportunity to succeed. By embracing diversity in content design, educators can create an inclusive learning environment where every learner feels valued and supported in their learning journey.

At the heart of INCLAVI is the motivation to empower the rights of PRMs and to enable the active participation in society and freedom of movement as EU citizens following a Universal Design approach which is a key factor for achieving accessibility for all. This overarching goal is directly in line with the key priorities of Erasmus+ and the fundamental result of INCLAVI is to ensure that this right is enabled through the actions of this project. This goal is also directly bringing into action the United National Convention on the Rights of Persons with Disabilities by providing the aviation sector with the skills to make this participation a reality.

8.2 Ensuring accessibility standards compliance

Designing learning content to ensure compliance with accessibility standards is crucial to guaranteeing equal access to education for all learners. This involves adhering to guidelines such as the Web Content Accessibility Guidelines (WCAG) to make materials usable by individuals with disabilities. Ensuring text is screen reader-friendly, providing alternative text for images, using clear and simple language, and offering captions and transcripts for audio and video content are just a few examples of practices that enhance accessibility. By designing with these according to WCAG standards in mind, educators can create learning materials that are inclusive and empower all learners, regardless of their abilities, to fully engage with the content and achieve academic success.

INCLAVI will adhere to all relevant accessibility standards and adherence will be tested throughout the development of the training programme with accessibility experts and organisations involved with the project.

8.3   Accessible digital platform and content design

The INCLAVI programme will be delivered as an online course, available both as a digital application (App for tablets and smart phones) and in a Web-based environment - Learning Management System (LMS).

The digital platforms and content will be designed to be accessible, conforming to the European Web Accessibility Directive (2016) and Web Content Accessibility Guidelines (W3C, 2023).

By following these requirements and guidelines, the INCLAVI course will be available to and usable by all learners – students and professionals – including those with disabilities. This will be a significant step towards providing equal opportunities in VET and HE institutions and for the employment of persons with disabilities in the aviation sector. Having the lived experience of disability may also prove to be an asset for aspiring students and job applicants who wish to work in the sector. The INCLAVI training course may also provide new job opportunities for professionals in aviation who may require re-training in other roles, for example, after acquiring a physical or sensory disability.

Accessible learning platforms and content typically include features that cater to a wide range of learning needs and abilities. These features aim to create an inclusive learning environment, ensuring that all learners have equal opportunities to access, engage with, and benefit from the educational material. Some key features present in accessible learning platforms and digital content include:

- Alternative Text: Alternative text (alt-text) is used to describe images, charts, and graphics so that screen readers can convey the information to visually impaired learners.
- Closed Captioning and Audio Descriptions: Closed captions are essential for learners with hearing impairments, while audio descriptions help visually impaired learners understand visual content.

- Adjustable Font and Text Sizes: Providing the option to adjust font and text sizes caters to learners with visual impairments or reading difficulties.
- Intuitive Navigation and Labelling: Clear and consistent navigation and labelling of pages, buttons, and links ensure that learners can easily navigate the platform and find the information they need.
- Compatibility with Assistive Technologies: Accessible content should be compatible with various assistive technologies, such as screen readers, speech recognition software, and alternative input devices.
- Colour Contrast and Minimised Scrolling: Sufficient colour contrast and minimised scrolling help learners with visual impairments or colour blindness to better perceive and interact with the content.
- Accessible Feedback: Providing accessible feedback ensures that learners with disabilities can understand and respond to feedback on their performance.
- Personal Preferences: Allowing learners to customise their learning experience according to their personal preferences, such as font size, colour scheme, and background noise, can enhance accessibility.
- Accessibility Statement: A clear and detailed accessibility statement on the learning platform helps learners understand the platform's accessibility features and how to use them.
- Timing Accessibility: Providing options to control the pace of content delivery, such as the ability to pause, rewind, or fast-forward multimedia content, can benefit learners with cognitive impairments or those who need additional time to process information.

9   Assessment and feedback strategies

Assessment is crucial to support learner learning in addition to measuring it for the purposes of giving a grade or certification, for example. A purposefully designed assessment is able to test what has been learnt and taught, i.e. is able to determine whether a learner has achieved the intended learning outcomes in terms of content knowledge and soft skills. Assessment tasks demonstrate learner's increasing ability to identify, think and solve problems in ways that are identical to those of experts within aviation.

A purposefully designed assessment entails different attributes to instructors and learners.

Table 6: Assessment attributes to learners and instructors.

To instructors	To learners
It applies methods that measure learners' achievement of assessment criteria in order to check actual learnings match with the learning objectives	enables learners to learn through preparing for and undertaking the assessment and from feedback on their performance
Enables instructors to understand how learners are responding to the teaching content	enables learners to benchmark their current level of knowledge or skills and to identify areas for improvement and overall progress made
is explicit and accessible to all instructors and learners in the process	provides learners with focused, relevant and guiding feedback in order to recognize future performance improvement areas and possibilities.

9.1 Formative assessment

Formative assessment is a type of evaluation used by educators to continuously monitor learner learning progress throughout a learning process. The primary goal of formative assessment is to provide feedback to both teachers and learners, helping them understand where the learner stands in their learning journey. It informs instructional decisions by identifying strengths and areas that need improvement.

Unlike summative assessment, which typically occurs at the end of a learning period to evaluate learner learning outcomes, formative assessment is ongoing. It can take various forms, such as quizzes, discussions, homework assignments, peer reviews, or instructor observations.

Formative assessment provides feedback in real-time or near-real-time, allowing for immediate adjustments to instruction. Feedback from formative assessment helps learners understand their current level of understanding, what they have mastered, and what they need to focus on. It is focused on the ongoing development of knowledge and skills, rather than just assigning grades. Formative assessment often involves learners in the assessment process, encouraging self-assessment and reflection.

By integrating formative assessment into teaching practices, educators can tailor their instruction to meet the needs of individual learners, thereby enhancing the learning experience and improving overall learner outcomes.

9.1.1 Examples of assessment: remembering

According to the first ladder of Blooms taxonomy, learners are required to recognise and recall information such as facts, concepts, terms, methods and procedures. Online quizzing is an appropriate tool for

assessing learning here. Diverse types of questions can be implemented in the online learning tool depending on the intended learning objective. The following table gives an overview of potential quiz types and their most relevant learning objectives.

Table 7. Examples of assessment methods for "remembering"

Quiz question type	Corresponding learning objective
Multiple choice	Recognising terms, understanding concepts
Classification	Putting concepts in relation, associating concepts, recognising hierarchies
Ordering	Analysing processes, identifying historical or time based developments
Short text	Reproducing concepts, dates, numbers
Missing text (fill-in-the-blanks) question	Understanding sentence structure, completing sentences/ words

9.1.2   Examples of assessment: understanding

According to the second ladder, understanding, learners are required to interpret knowledge and transfer it to a new context. Suitable assessment methods are for example concept maps, concept explanations in own words, paraphrasing exercises, summarising passages or text, comparing and contrasting ideas, interpreting diagrams or charts or a visual presentations of the topic. These can also

be peer reviewed on the learning platform, although this functionality will most likely not be used in the early versions of INCLAVI.

9.1.3 Examples of assessment: applying

According to the third ladder, applying, learners are required to apply knowledge (such as principles, laws, theories, methods) in similar, new or real-life settings. Suitable assessment methods are for example different types of problem-solving tasks, case studies with application questions, simulations or role-plays, hand-on activities or experiments, creating models or designs, performing tasks or constructing solutions to real world problems. These can also be peer reviewed on the learning platform, although this functionality will most likely not be used in the early versions of INCLAVI. Advanced quiz techniques can also be used for assessment of problem-solving tasks.

9.1.4 Examples of assessment: analysing

According to the fourth ladder, analysing, learners are required to break information down into smaller parts and determine how the parts relate to each other and the overall structure. Suitable assessment methods are for example document analysis, essay questions focusing on cause and effect, identifying patterns or trends in data, breaking down a complex process into components, critiquing arguments or theories, conducting a SWOT, comparing and contrasting different perspectives or evaluating the credibility of sources. These can also be peer reviewed on the learning platform or built up for automated review on an LMS, although this functionality will most likely not be used in the early versions of INCLAVI.

Assessment strategies can also be used to assess and measure real-world skills (applies to section 9.1.3 and 9.1.5 as well). Potential methods include simulations and practical, scenario-based assessments

to test how well learners can apply what they have learned in realistic contexts. Practical applications in assessments will enhance learners' ability to transfer theoretical knowledge into professional practice.

9.1.5 Examples of assessment: evaluating

According to the fifth and second highest ladder, evaluating, learners are required to critically examine information and to express their own opinion based on evidence. Suitable assessment methods are for example debates or discussions, peer reviews of projects or papers, creating and defending statements, developing and presenting a persuasive argument, critically reviewing a piece of literature or research, designing a rubric to assess the quality of work or conducting a cost-benefit analysis.

9.1.6 Examples of assessment: creating

According to the fifth and highest ladder, creating, learners are required to put elements together to form a new consistent whole or to reorganize elements into a new pattern or structure. Suitable assessment methods are for example designing and presenting a project or product, developing a new hypothesis or theory, writing a research proposal, composing a piece of music, artwork- or literature, building a website, planning and executing an expert meeting or developing a business plan.

9.2 Real-time feedback mechanisms

The INCLAVI training programme is based on a library of skills-specific targeted modules. Learners can track their progress with built-in

monitoring features in the learning application. Learners can receive real-time feedback on their progress and performances.

10 Conclusion

In conclusion, this pedagogical framework serves as a comprehensive guide to fostering an inclusive, supportive, and dynamic learning environment for INCLAVI. By prioritizing learner-centred approaches and integrating diverse instructional strategies, instructors both in industry and in academia can better meet the needs of all learners. This framework emphasizes the importance of ongoing professional development, reflective practice, and the utilization of data-driven insights to continuously improve teaching methodologies.

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