



Handbook and Recommendations

Adult Self-Learning:
Supporting Learning Autonomy
in a Technology Mediated Environment
2019-1-TR01-KA204-076875



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Adult Self-Learning: Supporting Learning Autonomy in a Technology-Mediated Environment

Cooperation for Innovation and Exchange of Good Practices

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PART I
ADULT SELF
LEARNING
HANDBOOK

INTRODUCTION

Take a look at the world around us and think of everyday use of digital devices and online facilities from finding your way in an unfamiliar environment to having video calls with your relatives from all ages. Think of the words you use every day which were not in your life 5 years ago. Think of people's sharing their life experiences ranging from highly personal to highly professional ones. Think of how many likes you give, get and see others give and get. Think of the visual, text and music content you find people are exposed to. The answers to these questions are probably very high, for information and communication as well as the language are now technologized, digitized, and globalized. Digital tools are available everywhere; they can be accessed any time, making it possible to manipulate and transform information for large populations.

This rapid change of the world with a vast amount of content created every second requires individuals to have new skills. Being digitally literate has become vital for a satisfying personal and professional life because various forms of technologies have become a part of older adults' everyday lives. Particularly since the pandemic, there has been a dramatic rise in the use of digital technologies and the internet in older adults' life as well. However, due to adoption, interest or acceptance problems, this rise is not as high as that of the younger population. Adults today could refrain from using technological devices due to various reasons including lack of interest, fear of making mistakes, lack of access to digital devices, lack of knowledge about how to implement these into their everyday life, lack of people to help and guide them in the process, etc. Whatever the reason is, those older adults are kind of excluded in some aspects when they are not digitally included.

Arousing positive feelings among older adults towards digital technologies is of vital importance (Li & Luximon, 2016). One of the solutions could be encouraging older adults to learn by themselves, self-learning. There are so many self-learning opportunities for adults, yet this does not mean that they do not need teachers or structured guidance. This can be considered necessary particularly when there is vast amount of information emerging every day everywhere. Digital skills are of great

importance for employability and professional development today. Immediate delivery of the information to the recipient changes the behaviours and expectations of the senders as well as the recipients (Derks & Bakker, 2010). Hence, the digital environment has important economic, political, and social impact on society. This process can be both enabled and jeopardized by the potential impact of IT on social inclusion.

With the current conditions of the world and its rapidly changing nature, the purpose of this project is to help older adults to acquire new skills and competences required by the new digitalized world. The project, and thus the present handbook, aims to teach older adults with low digital skills. The handbook includes seven main learning units, which include adult self-learning methods and techniques, digital literacy for adult self-learning, learning apps and software for adult learners, problem-solving skills for ASL, use of web-based sources for adult self-learning and professional development, and digital technology to enhance ASL and social inclusion.

Self-directed learning views learning as an individual powerful tool to learn at one's own pace and on one's own time. Adult self-learning aims at conjugating adult learning and self-directed learning. Hence, Chapter 1, Adult Self-Learning Methods and Techniques In Simulated Environments focuses on the most popular adult learning theories and methods, which include andragogy, transformative learning, experiential learning, self-directed learning, project-based learning, and action learning. The chapter presents the main assumptions of these theories, how they view adult learners, and what the ways of how to enhance adult learning through these methods.

The common definition of the ability to read and write is dated and too narrow in the world of digitalization. People at all ages need to have a particular set of knowledge, skills, attitudes, and values for the meaningful, critical and collaborative use of information and communication technologies so that they can be considered as literate in today's digitalized platforms or settings. Therefore, Chapter 2, Digital Literacy for Adult-Self-Learning focuses on describing media literacy by providing an overview of three significant groupings of media as print media, broadcast media, and new or digital media. The chapter also presents information about the term digital literacy by giving its

main components and makes a description of a digitally literate person. Finally, it links digital competence with employability.

Learning apps and software for adult self-learning have become more common and prominent particularly during and after the Covid-19 pandemic. Chapter 3 focuses on the learning apps and software as well as self-learning and educational software. The chapter also lists some best practices of Mobile applications for adult self-learning.

Problem solving is the act of defining a problem; determining the cause of the problem; identifying, prioritizing, and selecting alternatives for a solution; and implementing a solution. Chapter 4, Problem-solving Skills for ASL, focuses on the importance of problem-solving skills. The unit defines problem-solving and explains its stages. It also describes the problem-solving skills and gives some tips on how to develop them for real-life problems. Some important problem-solving skills include decision-making skills, communication skills, collaboration, open-mindedness, and analytical skills.

How to use digital technologies, online communication and virtual learning communities for adults' professional development is an important question. Chapter 5, Use of Web-Based Sources for Adult Self-Learning and Professional Development. The chapter offers some directions to help adults become self-directed lifelong learners and find solutions in the face of technical problems. The chapter concludes with some final remarks on the growing importance of computer-related skills both in the workplace and in job seeking.

Socially excluded groups are at greater risk of low well-being. The link between social exclusion and inequality is complex and difficult, and the digital environment has a major economic, political and social impact on society. Chapter 6, Digital Technology to Enhance ASL and Social Inclusion, explains the link between digital competences and social inclusion, provides information about the importance of social inclusion, and focuses on self-learning for adults in digital age.

1. ADULT SELF-LEARNING METHODS AND TECHNIQUES IN SIMULATED ENVIRONMENTS

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Abstract

This chapter focuses on adult education in an online environment. In the last decades, didactic material available on the web has been multiplied. How can these materials be used to improve adult people's knowledge and professional skills? This chapter illustrates and discusses methods and techniques that can support adult self-learning in a simulated environment. Adult learning motivation is a crucial issue in this environment, and a new way to motivate learners should be experimented.

Introduction

The central question of how adults learn has occupied the attention of scholars and practitioners since the founding of adult education as a professional field of practice in the 1920s. (Merriam, 2001).

The question that framed much of the early research on adult learning was whether or not adults could learn.

In the 1970s, self-directed learning appeared as a model that could help define adult learners as different from children.

Self-directed learning views learning as an individual powerful tool to learn at one's own pace and on one's own time. On the cognitive side, self-directed learning allows individuals to focus effort on useful information they do not yet possess, expose information inaccessible via passive observation, and enhance the encoding and retention of materials. Therefore, self-directed learning goals are to enhance learners' ability to be proactive in their learning and foster transformative learning.

Adult self-learning aims at conjugating adult learning and self-directed learning. Adult learning theories are based on the premise that adults learn differently than children. Here are the main characteristics of adult learning:

- Adults have an existing base of knowledge and life experience. Accordingly, their ability to learn can be influenced, positively or negatively, by their previous knowledge and life experience.
- Personal interests, wants, and needs motivate adults to learn.
- It's beneficial to let adults work things out for themselves and organize themselves.
- The role of "teacher" may be effectively filled by a mentor, coach, peer, or expert.

In the 1940s, Lorge (1944, 1947) pointed out that adult test scores were related to previous education and skills, not to age per se. Since older adults had less formal education and less opportunity to develop test-taking skills, it only appeared that they were less-capable learners.

Over the last century, a number of adult learning theories have been developed. However, there is not a single theory that explains all aspects of adult learning although each one enlightens a particular aspect of adult learning. The most popular adult learning theories and methods are:

- Andragogy
- Transformative learning
- Experiential learning
- Self-directed learning
- Project-based learning
- Action learning
- Simulated environment
- Social learning
- Adult self-directed learning environment
- Adult learning strategies

Andragogy

Developed by Malcolm Knowles in 1968, andragogy is described by its creator as the art and science of helping adults learn. The four principles of the andragogic approach are:

- Adults learn better from experience (even if they make mistakes).
- Adults favour a pragmatic approach and must be able to apply learning to solve a specific problem.
- Adults are most interested in learning things that have immediate relevance and applicability.
- Adults need to be involved in the planning and evaluation of their instruction.

Andragogy considers the adult learner as someone who:

1. has an independent self-concept and who can direct his or her own learning;
2. has accumulated a reservoir of life experiences that is a rich resource for learning;
3. has learning needs closely related to changing social roles;
4. is problem-centered and interested in immediate application of knowledge;
5. is motivated to learn by internal rather than external factors.

According to the above assumptions, Knowles proposed a program-planning model for designing, implementing, and evaluating educational experiences with adults. For example, with regard to the first assumption that as adults mature they become more independent and self-directing, Knowles suggested that the classroom climate should be one of “adulthood,” both physically and psychologically. In an “adult” classroom, adults “feel accepted, respected, and supported”; further, there exists “a spirit of mutuality between teachers and students as joint inquirers” (1980, p. 47).

Transformative Learning

Developed by Jack Mezirow in 1978, transformative learning theory posits that all learners use different assumptions, expectations, and beliefs to make sense of the world

around them. Accordingly, transformative learning attempts to help learners change - or transform - their existing frames of reference through a process of problem solving, procedural tasks, and self-reflection. Learning transformations occur when an individual tackles a “disorienting dilemma” that challenges their existing beliefs and critically reflects upon what has taken place (Mezirow, 2018).

Experiential Learning

Developed by David Kolb in the 1970s, by drawing on the work of John Dewey, Kurt Lewin, and Jean Piaget, experiential learning requires a hands-on approach that puts the learner at the center of the learning experience. Active participation is a key factor, but it must be integrated with the individual who reflects upon what they are doing. The four elements of experiential learning are:

- active involvement;
- reflection upon practice;
- conceptualization of the experience;
- use of knowledge acquired from experience.

Self-directed learning (SDL)

SDL is rooted in Malcolm Knowles’ theory of adult learning; in 1997, D.R. Garrison added elements of self-management to the model. SDL is a process where individuals take the initiative to define their learning needs, establish the learning goal, identify the learning resources, implement the learning plan, and assess their own results. Usually, SDL occurs with the help or supervision of teachers, mentors, resources, and peers. Learners must be able to access and select the appropriate learning resources.

Project Based Learning (PBL)

Developed by John Dewey in 1897, project based learning theory holds that learners acquire deeper knowledge through active exploration of real-world problems. Dewey called this principle “learning by doing.” PBL requires learners to solicit feedback and continually review results. This iterative process is believed to increase the possibility

of long-term retention of skills and knowledge. It requires the use of diverse skills, including inquiry, critical thinking, problem solving, collaboration, and communication.

Action Learning

Developed by Reg Revans in 1982, action learning is an approach to problem solving that involves taking action and reflecting on the results. The goal of action learning is to improve problem solving processes and simplify the resulting solutions. This approach tackles problems by first asking questions to clarify the problem, reflecting and identifying possible solutions, and only then taking action. Usually, action learning takes place in groups. In this case, the group should be able to take action on the problem it's working on. There should be a coach or a facilitator who helps the group to learn and work smarter and more effectively.

Simulated Environment

A simulation environment is defined as a programming environment of a computer, that is dedicated to systems simulation and that takes care for a flexible and intelligent interfacing between a user (i.e. the experimenter) and the system to be experimentally studied.

As an adult simulated learning environment, we intend a computer-based environment that will help learners how to practice self-learning.

Social Learning

Virtual communities are often created to provide information and support workers within an organization. In the last few years, several researchers investigated the non-formal and informal learning processes that take place on the Web, and the new term, social learning, was coined to designate this modality of learning (Baldwin, 2016).

In the literature, social learning is considered as a part of informal learning.

Adult Self-directed Learning Environment

Technology readiness is crucial in an adult self-learning online environment. It is a prerequisite to access and manage the learning resources.

Accordingly, learners who possess digital skills are more likely to adopt online learning strategies and achieve their learning goals. It implies that mastering web-based learning technologies is essential for self-directed online learning and influences learning achievements.

Adult Learning Strategies

In order to design effective educational opportunities for adults, one ought to take into account that unskilled jobs don't necessarily require low-skilled people. A low-skilled person is an individual who lacks the education or training necessary in order to become employed, whilst an unskilled job may require basic skills training for the work to be completed successfully.

Learning Motivation in an Adult Self-directed Learning Environment

Learning motivation (Figure 1) is a crucial factor in an adult self-directed learning environment. Research reveals that self-efficacy and goal settings are highly related to learning motivation (Che-Ha, Mavondo, & Mohd-Said, [2014](#); Dos Santos, 2020; Law & Breznik, [2017](#);).

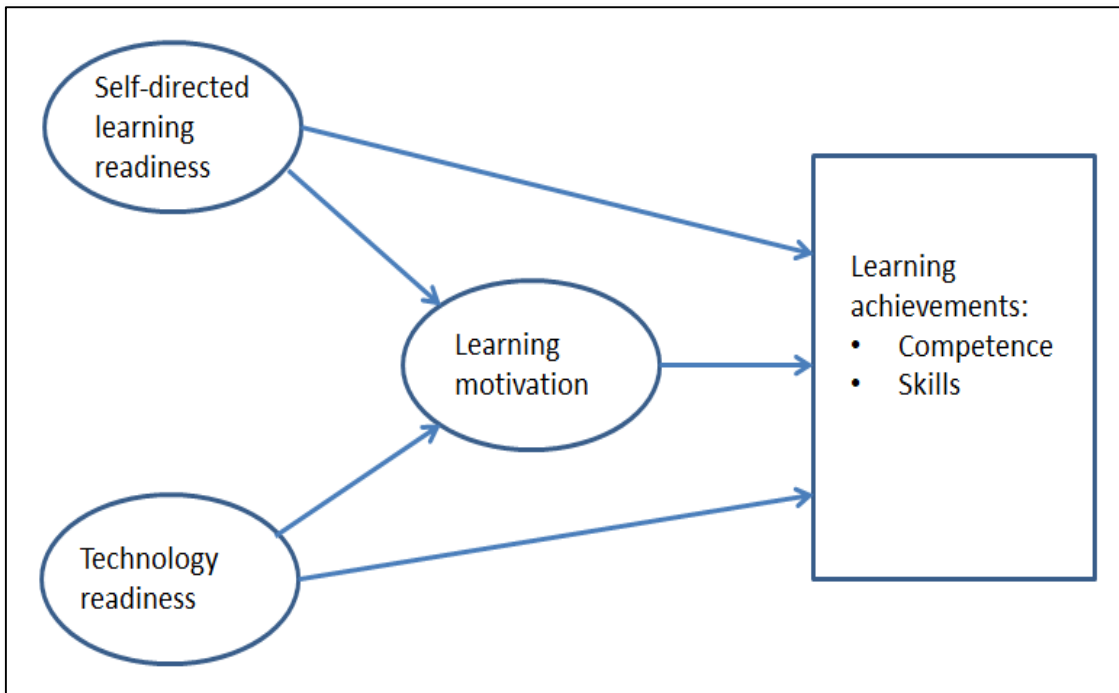


Figure 1. **Conceptual model of learning motivation (own source)**

Although various educational research emphasizes on learning motivation, its relationships between self-directed learning and technology readiness have not been sufficiently explored.

Tips to Enhance Adult Learning

Here are some tips on how you can apply your knowledge of adult learning theory to inspire your learners.

- **Link learning to expected results.** Most adult learning programs teach a mix of skills, knowledge, processes, procedures, and other specific notions aimed to improve learners' competence. The learning program should be designed to offer performance-based outcomes addressing the learners' needs.
- **Formalize your informal learning.** Also a self-directed learning program should be carefully designed and appropriately presented.
- **Build communities for practice.** Working in a group can facilitate the learning process. A community of practice can help learners to achieve the learning goals.

- **Chunk your content.** Long, complex learning modules can overwhelm learners with their sheer volume of information. Contents should be organized into smaller learning units that focus on one idea or one aspect of a larger topic.
- **Align learning to needs and capability.** Learning content should be tailored to the needs and capability of learners.

ADDITIONAL RESOURCES

1. **Midsundstad, T. (2019). A review of the research literature on adult learning and employability.** *European Journal of Education*, 54(1), 13-29. Available at: <https://onlinelibrary.wiley.com/doi/pdfdirect/10.1111/ejed.12321>
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2. DIGITAL LITERACY FOR ADULT-SELF-LEARNING

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Abstract

The changes on the requirements for being a literate person in the 21st century go hand in hand with changes in technology. In order to be considered as literate in today's digitalized platforms or settings, people need to have a particular set of knowledge, skills, attitudes, and values for the meaningful, critical and collaborative use of information and communication technologies. That's why, the scope of being digitally literate needs to be extended from the realm of just going online via computers. Grounding on this issue, this chapter begins with a description and emergence of media literacy and provides an overview of three significant groupings of media: print media, broadcast media, and new or digital media. Next, it teases out the term digital literacy by providing its main components and provides a comprehensive picture of what a digitally literate person is able to do. Finally, the chapter links digital competence to employability and particularly underscores that when low-skilled or unemployed adults are provided with appropriate trainings, they can develop their basic digital skills and therefore increase their chances of success in the labour market.

Introduction

Traditionally, the ability to read and write and use printed texts in various contexts is defined as literacy (Säljö, 2012). However, this definition is considered dated and too narrow, and some scholars argue that literacies should be thought in the plural sense (Kress, 2003; Østerud, 2004). The term literacy has a new meaning with the new world we are in because language, information, and communication are now technologized, digitized and globalized. Hence, traditional notions of literacy have had to be reconceptualized (Luke, 2007). Today, students are not prepared with only the traditional meaning of literacy in mind, instead schools incessantly try to equip students with the ability to understand different forms of information no matter how it is presented. With this approach, students are prepared for the future with a shift in that

children not only consume the information available on the Web, but also create content for the Web (Department of eLearning, 2015).

There is a growing trend among adults towards owning smart digital devices and using them in different areas of life. The digital tools are now available everywhere and can be accessed anytime. This factor made the manipulation and transformation of information available for large populations. However, the skills that need to be acquired could be considered historically new and when today's digitalized world is considered, they should be learned and used by large sections of the population. Despite the many forms and meanings of being digitally literate, reading something online is simply not enough for being digitally literate. Digital literacy can be defined as having the skills to live and work comfortably in a world in which a vast amount of content is created on a daily basis and also access to information necessitates use of digital technologies. Being digitally literate in today's media-rich environments is vital for a satisfying personal and professional life. Vrana (2016) argues that digital literacy is directly associated with a person's chances to get employed. That is to say, it involves ability to solve problems at levels of proficiency necessary to function on the job.

Media Literacy

The term media refers to the tools used to deliver information or data. While previously these tools referred to television, newspaper, or other mass communication tools, the ones utilized today go much beyond this definition. In today's world, the term media has to include broader and more detailed definitions of media such as broadcast media, advertising media, digital media, electronic media, published media, new media, mass media, interactive media, etc.

The term media literacy was first used back in 1965 by McLuhan. Jahromy and Jahromy (1989) stated that the world would become a global village and then it would be necessary to achieve media literacy as a new literacy. New hybrid forms of visual and print literacy are required in today's digitalized world, which has brought new terms such as digital literacy, information literacy, technology literacy, media literacy, multimedia literacy, visual literacy, etc. The term is actually now used with other fields

such as health literacy, technological literacy, academic literacy, art literacy, etc. Based on these expressions, it seems that the word literacy refers to the ability to handle information and indicate a synonym for expressions such as knowledge, competence and learning (Säljö, 2012).

The digital tools are now available everywhere and can be accessed anytime. This factor made the manipulation and transformation of information available for large populations. However, the skills that need to be acquired could be considered historically new and when today's digitalized world is considered, they should be learned and used by large sections of the population. This section of the paper focuses on only three important types of media that should be mastered by all people in this age: print media, broadcast media, and digital or new media.

Print media is defined as a whole range of publications that can be subdivided into two main categories in terms of their format and content: 1) media published at regular intervals such as newspapers and magazines, and 2) media for one-time publication such as books in different genres.

Broadcast media is defined as messages containing signals, print messages, or audio or video content sent electronically and simultaneously to a large group of recipients. Tools used in broadcast media include television, radio, magazines, newspaper, and more recently the internet, emails, and texts.

New media: The term new media refers to new information and entertainment technologies. Some examples for new media include the Internet, digital television, websites, social media networks, music streaming services, virtual reality, etc. Generally speaking, new media refers to content available on demand through the internet.

Electronic digitality enables to transfer data and provides interactive information, pleasure, and knowledge (Parayil, 2020). As stated by Ameli (2009), affordability, availability and interactivity of new media makes it more effective than older types of media. When it is considered that the technological tools that we use in our everyday

life make digital media available for most of the population, the importance of media literacy can be understood better.

Even for ordinary users, basic knowledge of media literacy includes the skills of accessing, analyzing, evaluating, and producing media content creatively. As the definition suggests, new media literacy is not limited to consuming media and involves the analysis of what is viewed, heard, or read in media platforms. Moreover, it involves the production of self-generated content (Ugurhan et al., 2020).

New media is composed of an information processing ecosystem where digital messages are created and accessed anytime, anywhere, and via any device (Chen, Wu & Wang, 2011). Users who once held the consumer role now have the necessary tools to produce and publish content reflecting their own opinions, and this new type of communication has blurred the distinctions between the sender and the receiver ends of the communication chain (Ugurhan et al., 2020). Therefore, limiting the definition of media literacy only with being a better-informed media consumer does not reflect the term fully. The term also encompasses critical skills for individuals to actively produce and share self-generated media messages.

Given the technological developments and societal pressures, there is a need for reconceptualizing the media literacies in a way to include new sets of skills to be utilized by individuals while functioning on the new media platforms which have become both popular and indispensable for the society today (Erstad, 2010).

In conclusion, with the global transformation we have been going through, which was accelerated with the conditions caused by the pandemic, the concept of media literacy has gone through dramatic changes in a way to indicate people's need to consume and produce media messages to make up for the communication needs. Users need to know the characteristics of the tools so that they can consume or produce such messages. Media messages containing digital texts, images, and moving pictures now enable digital connectivity, making the traditional definition of media literacy inadequate in today's digital age (Ugurhan et al., 2020). All the factors mentioned indicate the need for new media literacy education for all people from all age groups. A comprehensive

media literacy education can help users to understand mass communication resources correctly and enjoy them constructively (Liu, 2000). Users who benefit from such education have the chance to make full use of media resources to improve themselves and be engaged in social life. On the other hand, lack of these fundamental skills could lead to social exclusion in this digitalized era.

Digital Literacy

It is obvious that the needs of individuals of the 2000s are not the same as those of the 2020s because of the fast pace of the world. Robotics, artificial intelligence, virtual reality, cloud computing and even the culture of rapid obsolescence affect what individuals need and how they do something. In this increasingly digital world, everyone, from pre-schoolers to older adults, is expected to have some digital skills. Digital literacy and related skills are some of the most in-demand skills of our age. To understand the meaning of digital literacy, it is better to look at it along with media literacy and media literacy is further discussed in the previous pages.

Regular literacy is offline and involves reading, writing, grammar and syntax. Digital literacy, on the other hand, refers to the capabilities which fit a person for living and working in a digital society, so digital literacy requires not only cognitive but also technical skills. Digital literacy includes the ability to find and use information but it is not limited to this (Perdew, 2017). It goes beyond that to include communication, collaboration and teamwork, social awareness in the digital environment, understanding of e-safety and creation of original content without plagiarising (BBC, n.d.; Susman-Pera, Druckman & Oduro, 2020).

Digital literacy is the ability to effectively find, acquire, sort, process and use information across varied digital platforms and devices (Pangrazio, Godhe & Lopez Ledesma, 2020; Perdew, 2017). Digital literacy particularly includes PCs, mobile and handheld devices and media from the Web. More specifically, a few examples of digital literacy skills include being able to use search engines, sharing platforms and platforms for downloading effectively. In addition to these, a 21st century citizen is expected to

assess the value of the information he or she acquires using a digital platform considering the reliability and credibility of the information (BBC, n.d.; Wempen, 2015).

Digitally literate people are expected to effectively use various features of digital tools like computers (desktops, notebooks, etc.), software, online communication, online storage, creating and managing data and media. Computer literacy is the knowledge and ability you need to use computers and other related devices in an efficient way (Wempen, 2015). This includes the ability to find, process, share and create knowledge, and critically reason with a computer. Another aspect is the information literacy and this includes the ability of a person to successfully navigate online platforms and computers. This can be in the forms of hyperlinking, navigation in the Web, accessing and making use of internet resources, cyber safety, and the like. Naturally, it closely involves to recognise when information is necessary and how to locate, process and utilise that information (Welsh & Wright, 2010). Information literacy reflects a set of abilities to identify, locate, evaluate, use as well as to create information to reach goals, so it involves thinking critically (Perdew, 2017; Welsh & Wright, 2010). Another important aspect necessary to understand digital literacy is the role of visual messages in learning and communication. Visual literacy refers to a group of competencies that allows an individual to find and interpret images and visual media that are encountered in a platform (Felten, 2008). Another important interrelated dimension a digitally literate person can deploy is media literacy. It is defined as the ability to identify different types of media and access, understand and create media in a variety of forms (Potter, 2010).

There are many transformative skills necessary to be digitally literate, but this text briefly covers some of the selected skills such as basic tools, social media, cloud technology and remote collaboration (Murray, 2018). Besides transformative skills, tackling disinformation is also another aspect of being digitally literate. There is a growing awareness and even social media platforms launched coronavirus information services and a digital literate is expected to use such services effectively (Akhvlediani, 2020).



Figure 1. Fact Checking and Digital Responsibility.

Digitally literate citizens are expected to comfortably use a desktop, laptop, tablet, some basic communication and productivity tools. They should also have a basic understanding of what an operating system is or how popular utility programmes work (Wempen, 2015). They judge and choose information sources and the appropriate digital means they need to use to perform a specific task. The digital natives seem to engage with all types of digital technologies with any considerable effort, whereas research shows that they are not really adept at capitalizing on technology (Department of eLearning, 2015). For example, a digitally literate can order groceries using a mobile app and get them delivered directly to his door.



Figure 2. Online shopping.

Social media is a preferred communication method not only for young people but also for adults, so having an awareness of how social media platforms work matters. Digitally literate people are expected to know how to post, how to interact with, how to identify what a reliable source on social media is and how to protect their personal information (McNulty, 2021; Wempen, 2015).

Cloud computing, on the other hand, is the delivery of computing services – including data storage and computing – over the internet. The basic idea behind cloud technology is the acceptance by many people that running applications and storing files using remote servers on the internet (Ranger, 2018; Wempen, 2015). Some major benefits of cloud computing can be listed under cost, speed and productivity.

A fairly large number of businesses are on the move towards adopting cloud computing - a term which is used to mean accessing ICT services across the Internet. In this technology, the data processing occurs “in the cloud,” so the user does not need an expensive computer with a fast processor. Cheaper computers and other portable devices such as tablet computers can serve the same purpose thanks to cloud computing (Richards, McGreal, Stewart & Sturm, 2014).



Figure 3. Cloud Computing.

Virtual collaboration, by definition, is how virtual team members work together to get some work done by using technology-mediated communication (Krueger, 2008; Murray, 2018). This type of communication has gained importance for many professions over the years. For example, in the field of teacher education, online collaborative exchanges have the potential for developing their intercultural and linguistic competences and can also promote digital skills (Lin, Hu, hu & Liu, 2016; Vinagre, 2016).

In short, being a digitally literate person in a digitalised world might be a challenge for everyone from time to time due to the face pace of the world. For older adults who may be struggling in digital platforms, social support from the close circle can be effective, but what is key is learning how to learn in this increasingly digital world.

Digital Competence and Employability

Digital technologies have markedly impacted the ways in which people get into interaction with their buddies, family members, societies, organizations, and authorities. As technology becomes an indispensable part of a large set of circumstances from education to everyday and professional life, the core digital competencies are needed to be adopted to successfully participate in today's society.



Figure 3. Communicating Long Distance to Combat Social Isolation.

Acknowledged as one of the eight core competency areas determined by the European Commission (2018) with respect to lifelong learning, digital competence is comprehensively defined as “the set of knowledge, skills, attitudes, abilities, strategies and awareness that is required when using ICT and digital media to perform tasks; solve problems; communicate; manage information; behave in an ethical and responsible way; collaborate; create and share content and knowledge for work, leisure, participation, learning, socialising, empowerment and consumerism” (Ferrari et al., 2012, p.84). To put it more concretely, based on the analyses of fifteen selected frameworks, the authors have summarized the areas of digital competence as: (1) Information management; (2) Collaboration; (3) Communication and sharing; (4) Creating of content and knowledge; (5) Ethics and responsibility; (6) Evaluation and problem solving; and (7) Technical operations (p.89). Considering the aforementioned overarching definition and suggested areas, it could be clearly stated that digital competence does not simply refer to surfing the Web but having a good variety of skills and putting them meaningfully into action, particularly within the context of employability.

Technological and global innovations are changing not only most types of jobs but also the sorts of skills treasured by recruiters (Chui, Lund, & Gumbel, 2018). Occupational skills in a digitally-driven environment are getting more and more important for employers in different sectors of the economy. It is worth noting that this is not prevalent only among IT workers or college graduates; even low-skilled employees working in agriculture or hospitality are now expected to use technology effectively to do their share of tasks. However, the younger and older workers differ from one another in terms of the skills they apply while engaging with digital tools. Whereas young workers can concentrate more on how to use the most recent digital technologies, the older generation is puzzled and annoyed with the essential use of digital tools (Korchagina et al., 2020).

Previous research has also demonstrated that individuals who were deprived of digital technologies, or who didn't manage them and who were unable to enjoy the benefit of digital tools in everyday life offline often belong to older generations (Fleming, Mason, & Paxton, 2018; Yates, Kirby, & Lockley, 2015). It is well known that today's children are born in a digitalized world but it should be also here noted that adults have to deal with various obstacles and difficulties when they are required to accommodate to digital tools, which leads to a digital divide between young and old generations.

In the era of rapidly evolving digital world, lack of digital skills comes to mean social exclusion or job loss for a very long time since digital skills become a sine qua non not only for being recruited, but the job seeking process itself. Those days when individuals were trying to find a job in newspapers are long gone considering that the internet is accepted as the main source of job postings. Both recruiters and candidates are similarly heading towards online platforms and tools (ESCO, 2017). Any candidate who lacks the basic skills to manage simple digital tasks are unable to even pass by the door (Bradley et al., 2017).

Being equipped with the basic digital skills from the very beginning career journey, including word processing, browsing the internet, developing a professional profile in online community, building an online curriculum vitae should be considered as the utmost important qualification and should therefore not be undervalued. Even social

networking sites are increasingly becoming important means of creating professional existence. But still, building and sustaining an influential online profile enriched with text and images may not be a straightforward issue for low-skilled individuals. For this reason, as argued by Faure et al. (2020), quite lots of job seekers have to come up against the essential need to acquire many of the digital skills, which otherwise makes those people face with the risk of digital exclusion or long lasting unemployment.



Figure 3. Applying for Jobs Online

An American research study which examined the online job postings revealed that approximately 35 percent of advertisements demanded candidates to possess at least one or two information technology skills (Beblavy et al., 2016). By the same token, the results of the European Digital Skills Survey highlighted a pressing requirement for basic ICT skills in the American job market. For instance, knowing how to work with a computer, writing and sending an email, creating documents or managing online information were demanded throughout the job market even for the jobs which normally do not require high skills (Kispeter, 2018).

As for the digital skills gap in the UK, the Lloyds Bank UK Consumer Digital Index report, published in 2018, showed that approximately 5.8 million people did not attempt to use the internet at all, and 11.3 million adults lacked the basic digital skills that they need to be fully involved in digital economy of the country (Llyod Bank, 2018). It is estimated that 6.9 million UK people will sustain their status as being “digitally excluded” by 2028 (Anderson, 2020). Another recent study examining how many organisations have been affected by the scarcity of digital skills and what kind of skills are most lacking today has found that 88 percent of the English corporations are now lacking in digital skills and the level of digital incompetence is expected to rise up in the coming years (ibid).

As a conclusion, it could be revealed that the need for individuals with digital competence in almost all professions is growing exponentially, even in the professions which may not be predominantly considered as digital. If workers aim to forge ahead in the labor market, they need to possess basic digital skills. By means of digital training to be provided for particularly digitally-excluded adult learners and unemployed citizens, it is very possible to bridge this gap. Accordingly, trainers or educators could be suggested to initiate programs that may help job hunters and low-skilled employees to develop basic digital competence. Furthermore, they might teach these disadvantaged people how to apply this knowledge within the context of different occupations and work settings, tackle problems, and accommodate to new technology-mediated environments.

Conclusion

With general terms, literacy is defined as people's ability to read and write properly with the intent of getting individual goals done, upgrading knowledge and being constructively involved in occupational and societal practices. However, accompanied by the globalization and rapid developments in our technological society, the notion of literacy has gone beyond involving written information to embracing the new concepts of information and communication technologies. This means that as digital technology diffuses intensely through the everyday aspects of life, the fundamental goal takes on a new mission as an active literacy. This contemporary form of literacy is a prerequisite

for people to take part effectively in today's digital environments for the processes of creating, adapting and sharing information and knowledge in various formats. For this reason, various literacy terms such as digital literacy, media literacy, information literacy, technology literacy, and multimedia literacy, have been introduced and enlarged with the advent of digital tools.

Taking the new form of literacy into consideration, one can easily figure out how online learning has become of capital importance for lifelong learning community. This chapter particularly throws light on the reason why there is a vital need to improve adults' digital competence and assure their successful participation in information society. It is also underscored throughout the chapter that a good number of low-skilled or unemployed adults are on the line of digital exclusion or long lasting unemployment as they lack the skills to catch up with the latest web-based technology. Once these adults are provided with the necessary support and training on the use of ICT-based resources, they should be able to acquire knowledge, skills, and attitudes that would help them achieving their individual goals with respect to personal and professional development, employment and many other everyday aspects of life.

ADDITIONAL RESOURCES

- 1. Equipping a generation to take its place in digital revolution:**
<https://www.youtube.com/watch?v=aEjUIH7bNDo&t=258s>
- 2. UNESCO-UNEVOC webinar on Digital Competence and the Future of Work**
<https://www.youtube.com/watch?v=eER8bQIDAZ4>
- 3. EPALE OER: Digital Skills & Competences for Adult Learners**
<https://www.youtube.com/watch?v=6ItBjiDQdI8>
- 4. Digital citizenship education handbook**
<https://rm.coe.int/digital-citizenship-education-handbook/168093586f>

3. LEARNING APPS AND SOFTWARE FOR ADULT SELF-LEARNING

Renata Ochoa-Daderska, Zofia Gródek-Szostak,
Luis Ochoa Siguencia, Gabriela Ochoa-Daderska,
Fundacja Instytut Badan i Innowacji w Edukacji – Poland

Abstract

In the last decade, and especially in the last years, technology is becoming more incorporated into everything, including in education. Educational apps are popping up from basic education and literacy to workplace readiness and more. Due to the COVID-19 pandemic situation, adult education institutions had to adapt their teaching methods to more technology based methodology and that is why, our chapter presents some of the leading learning apps and software for adult self-learning. These programs can be used as a reinforcement of what was learned before or self-learning. The Chapter has an introduction, To the topic, how to motivate to use these apps and software, the use of ICT in self-learning, educational computer software and a list of 10 best practices of Mobile applications for Adult Self-Learning.

Introduction

Information technologies determine changes in learning processes and have a significant impact on the revision of self-education methods and Andragogy. Before diving into the analysis of apps and educational programs for self-learning, it is important to define some terms that will help us better understand our subject.

Andragogy as a sub-discipline of pedagogy deals with adult education. This field was established in the 20th century, and initially it was part of general pedagogy and the philosophy of education. Andragogy is the study of goals, content, forms, methods, principles of teaching, education, upbringing, self-education, and self-education of adults. It is a social, humanistic and upbringing science.

According to this definition, upbringing is the process of adapting a person to the changes that take place around him in various areas of life, as well as the preservation of

man's individuality and the development of his personality; therefore, human education is related to self-study. It aims to acquire knowledge and habits.

Through andragogy, we learn about three main goals in adult education:

- harmonic development of the full personality (human as a whole)
- disseminating general knowledge in adult education, which gives a person flexibility, broadens the horizons of thinking, easier adaptation to changes
- enabling adults to retrain, acquire new information, new professional competences, professional development.

To these concepts, we should add the learning environment. Trainers working with adults must take into account the advantages of the New technology and try to implement it to the learning methods and tools. Researchers agree that in the era of ubiquitous modern information and communication technologies (ICT), they should also be present in the process of adult education. Modern adult education is moving away from didactic encyclopedism in favour of combining traditional lecture methods with the use of ICT, with active group work methods, workshops, trainings or the method of moderation (Ochoa-Daderska, et al., 2021).

Adult modern adult education is one in which the trainer does not have "one right" role and the only effective method of education. Instead, as a trainer, facilitator or moderator, he uses the personal interests, experience and internal motivation of adults to learn. By creating a positive and supportive learning environment, it motivates an adult learner to acquire knowledge on their own, inspires and strengthens the learning processes. The learner, thanks to such activities of the trainer, independently manages the process of learning and development, strengthens the sense of their own agency, and thus their own worth (Ochoa-Dąderska; Sánchez-García, et al., 2021).

For this reason, when presenting the Learning apps and software for adult self-learning, we must take into account not only the learning methods and tools but also the way how to motivate adult learners for self-learning environments. This objective is in connection

with our “Adult self-learning: supporting learning autonomy in a technology-mediated environment” ERASMUS+ project (Ochoa-Dąderska; Ochoa Siguencia, et al., 2021) :

- To teach learners to acquire new skills and competences using learning innovative practices and digital technologies;
- To develop a functioning collaborative learning environment to help them identify skills gaps and needs and to collaborate locally and independently for joint capacity-building.

Adult Self-Learning Motivation to Use Learning Apps and Software

Learning to learn is very important these days. The methods, technologies, and the whole world around is in a continuous change. Today no one performs the same tasks in the same way as on the first day of work. So it is necessary to improve our skills throughout our life and acquire new ones. The new knowledge acquired must be put into practice and again start to look for new knowledge - in short, learn throughout our life.

Researchers agree that the common belief that intellectual performance decreases with age is wrong. The results of their research showed that people can develop their mental abilities into old age, provided that the methods of education are adapted to the level and characteristics of their intellectual ability. When learning, adults use crystallized intelligence - using acquired experiences and mental habits, their strategies of thinking and organization of knowledge (Acomi, et al., 2021).

The condition for progress in learning is constant mental activity and this can be achieved using different apps and software available on the Internet. Just as physical exercise keeps our body in good shape, mental exercise ensures long-term learning. Therefore, if we want our adult learners to develop their abilities and skills, we must constantly provide them with opportunities for continuous improvement.

According to M.S. Knowles, the main motivation of adults is intrinsic motivation. External punishments and rewards seem to be less effective. Proposed by M.S. Knowles' andragogical model of adult learning assumes a fundamental differentiation of

motivating factors. They tend to trigger higher motivation when they see the possibility of solving life problems in this way or see the inner benefits of the learning process (Knowles, et al., 2009). In Adults a stronger motivating factor is certainly the satisfaction of a person's internal needs, such as the desire to achieve greater satisfaction with the work performed, increase in self-esteem, quality of life (Anconi, Ochoa Siguencia, et al., 2021).

The Use of Information and Communication Technology in Adult Self-Learning

A new trend in adult education, which seems to be one of the fastest growing recently, is the popularization of non-formal and informal education. This means exploring new competences without using programs run by educators / trainers (without a teacher / trainer / trainer), through independent activity undertaken to achieve specific learning outcomes, and / or through unintended learning (Gródek-Szostak, et al., 2021)..

The popularization of this concept of adult education is undoubtedly favoured by the development of the Internet and modern technologies, in particular social media, and the Web 2.0 trend clearly visible on the Internet. In addition to the internet, the development of mobile technologies and tools also plays a significant and supportive role in adult learning. Adult social learning can take place not only through popular websites such as Facebook, YouTube or Twitter, but also on various educational platforms, vortals, specialized discussion forums or by running or regularly reading original blogs (Mentor, 2021).

Social media is often a tool used by Adult learners for self-study because support formal, non-formal and informal learning. The use of social media may pose support for learning and teaching processes. However, the degree of effectiveness is unknown and the conditions for such activities. New forms of self-education, such as informal e-learning or micro-learning, carried out at different times of daily activity, they can constitute a bridge between formal and non-formal learning.

Thanks to the development of ICT, it has become possible to disseminate modern forms of adult education, such as: e-learning, blended learning or m-learning (involving the use of mobile technologies in the education process). As research shows, in the case of adult education, one of the most effective solutions may be blended learning (Velinow, et al., 2021). It is based on a kind of "natural" connection in the process of educating traditional education with the use of modern technologies. The most common form of blended learning training is a combination of traditional classes with online classes. In the mixed process, both traditional teaching tools and methods as well as new ones, mainly related to e-learning, are used in order to achieve the highest possible effectiveness.

Educational Computer Programs Software for Adult Self-Learning

Educational software refers to any computer application that enhances learning. It includes classroom management software, learner information systems, language software, reference software, and much more. Educational software makes learning more effective and efficient. So, as a trainer, trainee, organization administrator, you will find the software essential.

Educational software not only improve learning experience, but they also facilitate communication and reduce inefficiencies.

There are different categories of educational programs:

- Learning management tools like Google Classroom, ProProfs, TalentLMS, and Schoology allow trainers and coaches to upload and organize different course material for student access.
- Learner information systems, such as Wisenet and Workday. Their purpose is to store and track learner information, such as attendance records, grades, and more.
- classroom management software that Trainers use to make lesson plans more interactive by engaging learners. Examples include ClassDojo, Socrative, Edmodo, LanSchool, and Dyknow.

- assessment software, such as Kahoot!, GoReact, and Canvas. This category of education software provides learners with a portal for taking computerized quizzes and tests.

Educational computer programs, due to their formal features, can be divided into (Gruba, 2002):

- computer games - generally we can think that these programs are developed for the youngest recipients, and are not intended for implementation specific educational and therapeutic goals, they only prepare for work with computers. In our opinion it is wrong because Adults can use computer games for training our concentration and gaining new skills;
- computer exercises - they are used to achieve the assumed educational goals and therapeutic exercises, similar to traditional exercises (they differ in the form of communication, combining texts with graphics, animation, sound). Adults can solve different tasks learned in the non-formal education process;
- utility programs - text, graphics, sound editors, etc .;
- information programs - they present knowledge in various fields (programs for creating presentations, multimedia encyclopaedias, etc.).

Mobile Applications for Adult Self-Learning

We live in a time when more and more activities that used to be the domain of stationary devices are now performed mobile. We observe a similar process in the field of education. There are more and more smartphone users each year. Along with the growing popularity of mobile devices, the number of mobile applications, including educational ones, is growing.

Below we will present a list of educational apps we think are worth trying if you want to invest in your personal development.

1. Language Coach

There is no need to convince anyone about the importance of language skills in the modern labour market and tourism. " Language coach " - the application available for Android systems allows you to learn the basics of as many as 33 languages. The learning method is based on the flashcard drill concept. The user has a choice of 8 types of exercises and decides himself when he is ready to go to a higher level of advancement. The application contains over 2000 phrases in 33 languages. Each of them is illustrated and enriched with the voice of the teacher. Learning the first language is free, we have to pay for the next ones. Can be downloaded from Google play.

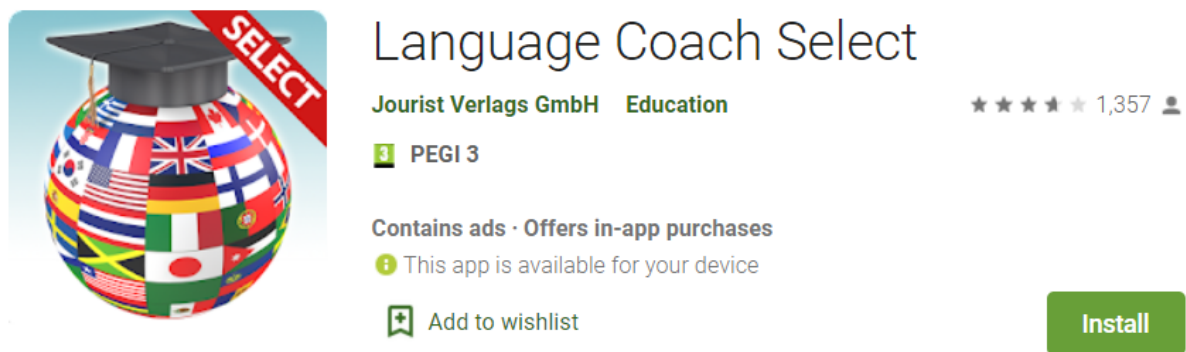


Image 1: from <https://play.google.com/>

2. Lumosity: Brain Training

In order for our brain to stay fit until old age, it needs training just like our muscles. The Lumosity app, often referred to as the virtual brain trainer, is definitely noteworthy to train our brain. Thanks to simple logic games and tasks, it allows the users to improve the efficiency of their mind in areas such as concentration, memory, speed of decision-making or the ability to instantly associate facts.

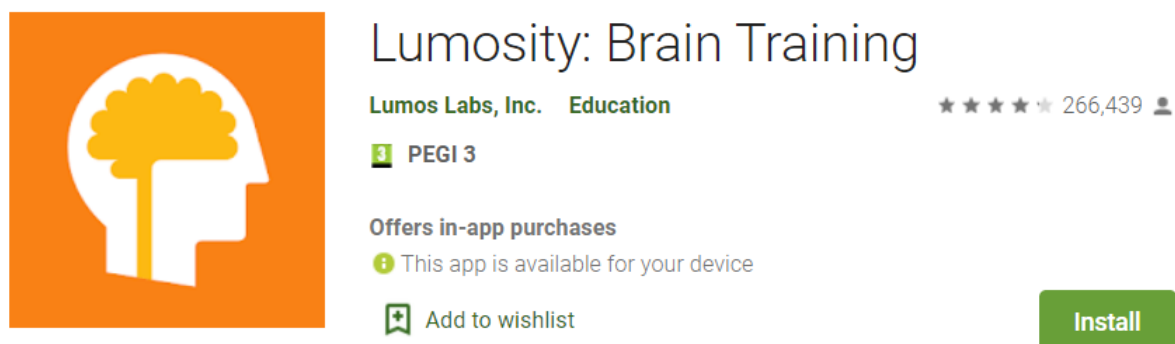


Image 2: from <https://play.google.com/>

3. Ted Talks

Ted is a series of conferences prepared by Sapling Foundation. Ted Talks is an application that allows users to listen to all presentations on their mobile phone. The speakers include experts in many areas: technology, politics, ecology. The main goal of the foundation is to popularize science, and the lectures are free and available both in the form of audio podcasts and video recordings.

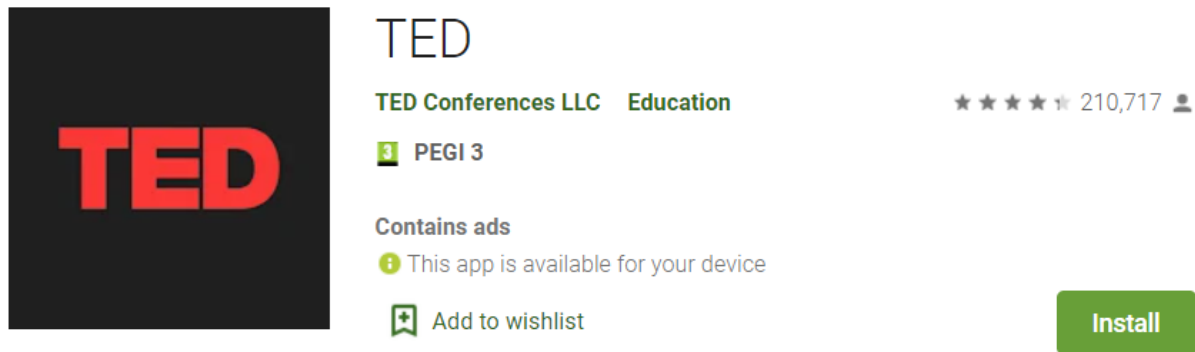


Image 3: from <https://play.google.com/>

4. Converter Plus

The ability to convert measures and weights is very useful in various life situations. However, not all of us can make precise, mathematical calculations in our heads. Converter Plus is an application that takes us into the world of mathematical calculations and helps to quickly find answers to questions about the measure converter. The application is easy to use and has a friendly interface.

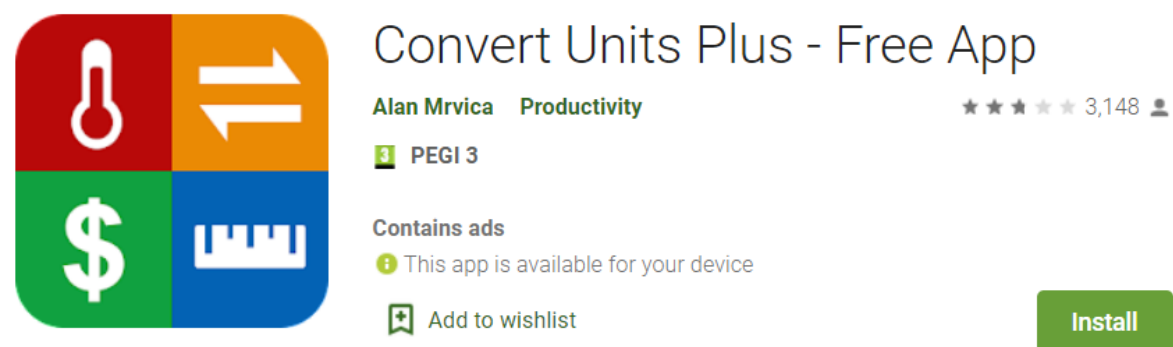
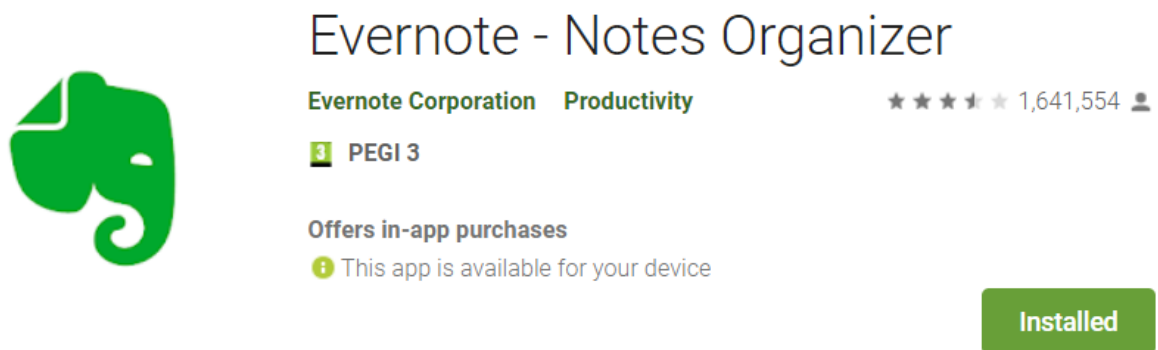


Image 4: from <https://play.google.com/>

5. Evernote

Ideas sometimes pop up suddenly in our head, so we always have to be prepared to write them down. Memory likes to play tricks on us and when we have the opportunity to record, it may turn out that we forget what we tried so hard to remember. Evernote application permit us to save our ideas at any time, whether we are. The great advantage of the application is the fact that in this virtual notebook you can save information not only in text, but also graphics or even sound.

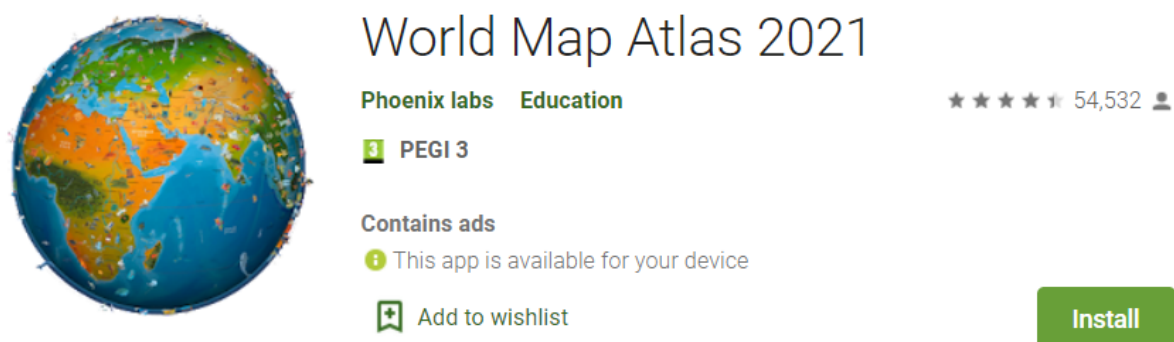


The screenshot shows the Google Play Store page for the Evernote app. On the left is the green elephant logo. The app title is 'Evernote - Notes Organizer'. Below the title, it says 'Evernote Corporation Productivity' with a 4.5-star rating and 1,641,554 reviews. The age rating is 'PEGI 3'. It also states 'Offers in-app purchases' and 'This app is available for your device'. A green 'Installed' button is visible on the right.

Image 5: from <https://play.google.com/>

6. World Map Atlas

Useful application for lovers of geographic knowledge. It is an extremely carefully compiled mobile atlas of information, graphs and photos by the National Geographic Society. Information presented in the application is not only reliable but also very interesting. In the virtual atlas we will find information on individual countries, their symbols, number of inhabitants, political system, history and currency conversion. The program, apart from the fact that it allows you to significantly expand your geographic knowledge, also helps you plan trips due to the available, up-to-date weather forecasts and the ability to estimate distances.



The screenshot shows the Google Play Store page for the World Map Atlas 2021 app. On the left is a globe icon. The app title is 'World Map Atlas 2021'. Below the title, it says 'Phoenix labs Education' with a 4.5-star rating and 54,532 reviews. The age rating is 'PEGI 3'. It also states 'Contains ads' and 'This app is available for your device'. There is an 'Add to wishlist' button and a green 'Install' button on the right.

Image 6: from <https://play.google.com/>

7. IMathematics

It is a real mine of knowledge for all those who want to explore mathematics. The application has 700 available formulas and definitions from over 120 topics. By using the application, we can check what we have learned thanks to special quizzes that allow us to consolidate the acquired knowledge. It is a kind of mathematical compendium, an invaluable help in learning mathematics for every learner. As befits a mathematical device, IMathematics also has a built-in graphing calculator.

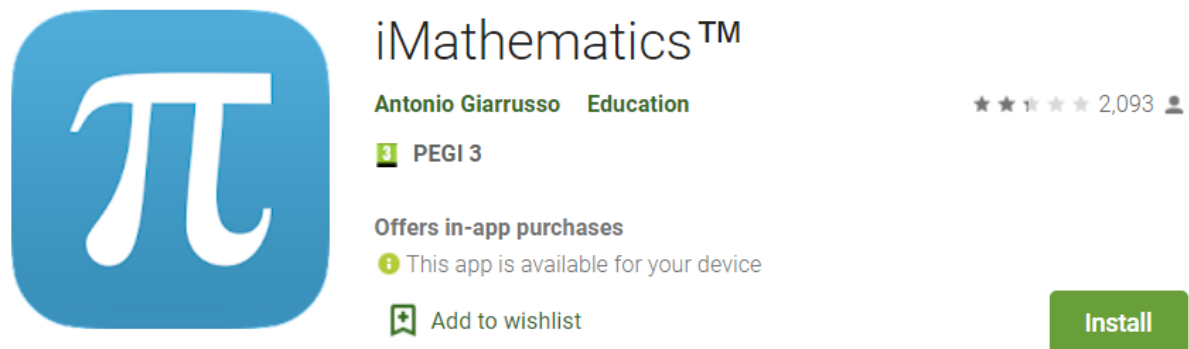


Image 7: from <https://play.google.com/>

8. Udemy

This application, when working in conjunction with the website, is considered to be the largest collection of online courses worldwide. Udemy enables comprehensive education in many areas. Many of the applications posted on Udemy are free, and those that are paid for are often offered at promotional prices. The courses are conducted in English language but anyone who knows only the basics of the English language can easily understand the content presented.

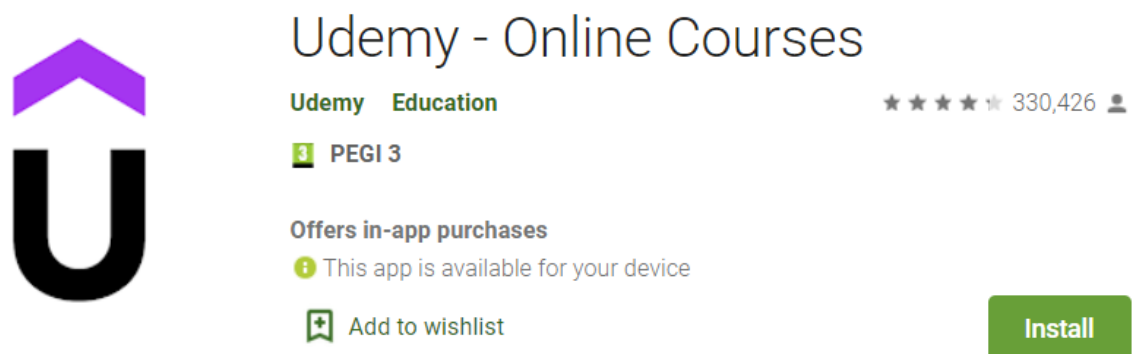


Image 8: from <https://play.google.com/>

9. How to Draw

It is a graphics program thanks to which its user learns the basics of drawing. The application will appeal to both people who are just starting their adventure with drawing and those who want to develop their skills. As the drawings present different styles and different levels of difficulty, the user can step by step from the simplest to more complicated tasks and systematically develop his skills.

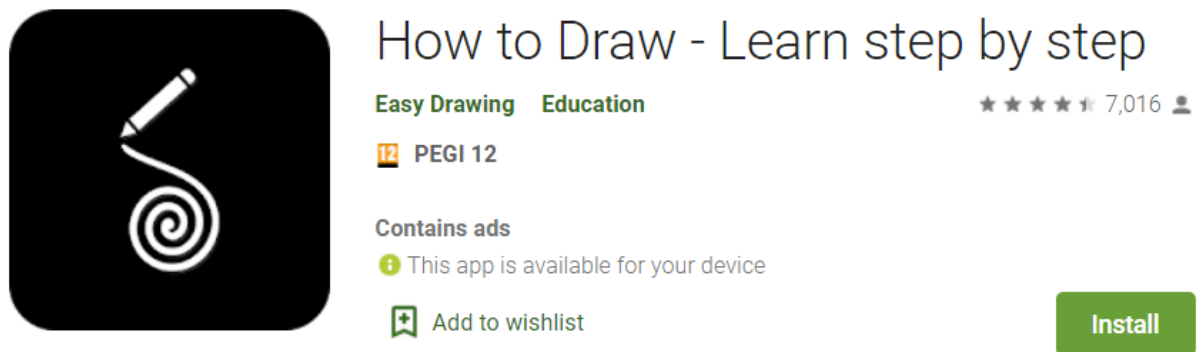


Image 9: from <https://play.google.com/>

ADDITIONAL RESOURCES

1. The 10 Best Learning Apps of 2022:

<https://www.lifewire.com/best-learning-apps-4176357>

2. E-learning methodologies and good practices: A guide for designing and delivering e-learning solutions from the FAO elearning Academy:

<https://www.fao.org/3/i2516e/i2516e.pdf>

3. The BEST free apps for language FLUENCY in 2021! (+ Free PDF & Quiz):

https://www.youtube.com/watch?v=2Y3yssM3q1o&ab_channel=EnglishwithLucy

4. Assistive Technology Apps And Tools for Students & Adults with Dyslexia:

<https://www.youtube.com/watch?v=iLrz6RzXhXI>

5. 25 Apps and Tools to Inspire Self-Directed Learning:

<https://blog.planbook.com/self-directed-learning-apps>

4. PROBLEM SOLVING SKILLS FOR ADULT SELF-LEARNING

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Three Thirds Society NPO – Greece

Abstract

Problem solving is the act of defining a problem; determining the cause of the problem; identifying, prioritizing, and selecting alternatives for a solution; and implementing a solution. Effective problem solving usually involves working through a number of steps or stages, such as Problem Identification, Structuring the Problem, Looking for Possible Solutions, Making a Decision, Implementation, Monitoring/Seeking Feedback. Important problem-solving skills can be defined as: Decision-making skills, Communication skills, Collaboration, Open mindedness, Analytical skills There are many problem-solving models that can be used. One of the most known is the Woods' problem-solving model. Besides the use of models, an essential parameter in problem-solving is creativity as well as ways to improve and enhance problem solving skills.

Introduction

The Concise Oxford Dictionary (1995) defines a problem as:

“A doubtful or difficult matter requiring a solution”

and

“Something hard to understand or accomplish or deal with.”

It is worth also considering our own view of what a problem is.

We are constantly exposed to opportunities in life, at work, at school and at home. However many opportunities are missed or not taken full advantage of. Often we are unsure how to take advantage of an opportunity and create barriers - reasons why we can't take advantage. These barriers can turn a potentially positive situation into a negative one, a problem.

Are we missing the 'big problem'? It is human nature to notice and focus on small, easy to solve problems but much harder to work on the big problems that may be causing some of the smaller ones.

It's useful to consider the following questions when faced with a problem.

- Is the problem real or perceived?
- Is this problem really an opportunity?
- Does the problem need solving?

All problems have two features in common: **goals and barriers.**

Goals

Problems involve setting out to achieve some objective or desired state of affairs and can include avoiding a situation or event.

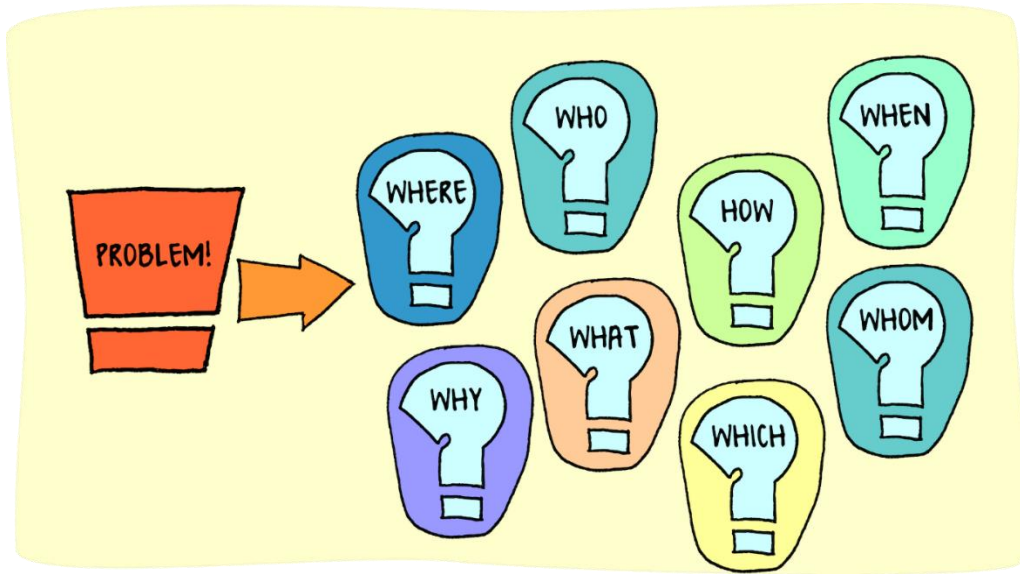
Goals can be anything that you wish to achieve, or where you want to be. If you are hungry then your goal is probably to eat something. If you are the head of an organization (CEO), then your main goal may be to maximize profits and this main goal may need to be split into numerous sub-goals in order to fulfil the ultimate aim of increasing profits.

Barriers

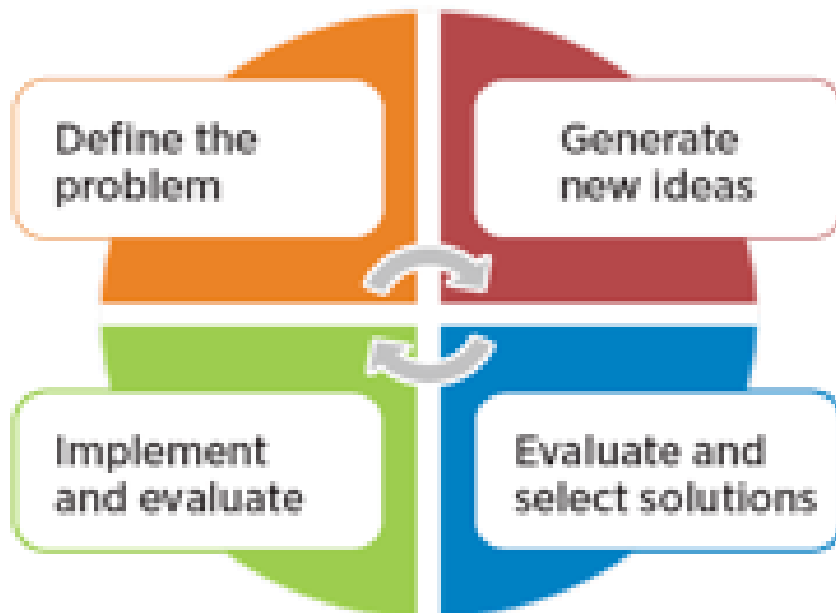
If there were no barriers in the way of achieving a goal, then there would be no problem. Problem solving involves overcoming the barriers or obstacles that prevent the immediate achievement of goals.

Following our examples above, if you feel hungry then your goal is to eat. A barrier to this may be that you have no food available - so you take a trip to the supermarket and buy some food, removing the barrier and thus solving the problem. Of course for the CEO wanting to increase profits there may be many more barriers preventing the goal from being reached. The CEO needs to attempt to recognize these barriers and remove them or find other ways to achieve the goals of the organization.

What is Problem Solving and Why is it Important?



Problem solving is the act of defining a problem; determining the cause of the problem; identifying, prioritizing, and selecting alternatives for a solution; and implementing a solution.



Problem Solving Chart

The ability to solve problems is a basic life skill and is essential to our day-to-day lives, at home, at school, and at work. We solve problems every day without really thinking about how we solve them. For example: it's raining and you need to go to the store. What do you do? There are lots of possible solutions. Take your umbrella and walk. If you don't want to get wet, you can drive, or take the bus. You might decide to call a friend for a ride, or you might decide to go to the store another day. There is no right way to solve this problem and different people will solve it differently.

Problem solving is the process of identifying a problem, developing possible solution paths, and taking the appropriate course of action.

Why is problem solving important? Good problem solving skills empower you not only in your personal life but are critical in your professional life. In the current fast-changing global economy, employers often identify everyday problem solving as crucial to the success of their organizations. For employees, problem solving can be used to develop practical and creative solutions, and to show independence and initiative to employers.

Stages of Problem Solving

Trying to solve a complex problem alone however can be a mistake. The old adage "*A problem shared is a problem halved*" is sound advice.

Talking to others about problems is not only therapeutic but can help you see things from a different point of view, opening up more potential solutions.

Effective problem solving usually involves working through a number of steps or stages, such as those outlined below.

1. Problem Identification

This stage involves: detecting and recognizing that there is a problem; identifying the nature of the problem; defining the problem.

The first phase of problem solving may sound obvious but often requires more thought and analysis. Identifying a problem can be a difficult task in itself. Is there a problem at all? What is the nature of the problem, are there in fact numerous problems? How can the problem be best defined? By spending some time defining the problem you will not only understand it more clearly yourself but be able to communicate its nature to others, which leads to the second phase.

2. Structuring the Problem

This stage involves: a period of observation, careful inspection, fact-finding and developing a clear picture of the problem.

Following on from problem identification, structuring the problem is all about gaining more information about the problem and increasing understanding. This phase is all about fact finding and analysis, building a more comprehensive picture of both the goal(s) and the barrier(s). This stage may not be necessary for very simple problems but is essential for problems of a more complex nature.

3. Looking for Possible Solutions

During this stage you will generate a range of possible courses of action, but with little attempt to evaluate them at this stage.

From the information gathered in the first two phases of the problem solving framework it is now time to start thinking about possible solutions to the identified problem. In a group situation this stage is often carried out as a brain-storming session, letting each person in the group express their views on possible solutions (or part solutions). In organizations different people will have different expertise in different areas and it is useful, therefore, to hear the views of each concerned party.

4. Making a Decision

This stage involves careful analysis of the different possible courses of action and then selecting the best solution for implementation.

This is perhaps the most complex part of the problem solving process. Following on from the previous step it is now time to look at each potential solution and carefully analyse it. Some solutions may not be possible, due to other problems like time constraints or budgets. It is important at this stage to also consider what might happen if nothing was done to solve the problem - sometimes trying to solve a problem that leads to many more problems requires some very creative thinking and innovative ideas.

Finally, make a decision on which course of action to take - decision making is an important skill in itself and we recommend that you see our pages on **decision making**.

5. Implementation

This stage involves accepting and carrying out the chosen course of action.

Implementation means acting on the chosen solution. During implementation more problems may arise especially if identification or structuring of the original problem was not carried out fully.

6. Monitoring/Seeking Feedback

The last stage is about reviewing the outcomes of problem solving over a period of time, including seeking feedback as to the success of the outcomes of the chosen solution.

The final stage of problem solving is concerned with checking that the process was successful. This can be achieved by monitoring and gaining feedback from people affected by any changes that occurred. It is good practice to keep a record of outcomes and any additional problems that occurred.

What are problem-solving skills?

In the workplace, unexpected issues and situations arise fairly frequently. **Problem-solving skills refer to the ability to tackle and resolve these problems when they occur.** It's a fundamental soft skill that falls into the category of critical-thinking skills, which allow you to deal with and resolve complicated, complex scenarios.

Problem-solving skills are a valuable trait that most employers seek in candidates. Being able to effectively solve problems is beneficial in nearly any position and can support a person's overall career advancement. Here we explore what problem-solving skills are, the most important skills in the workplace, steps to solve problems, and tips for improving this skill set.

Problem-solving skills are skills that allow individuals to efficiently and effectively find solutions to issues. This attribute is a primary skill that employers look for in job candidates and is essential in a variety of careers. This skill is considered to be a soft skill, or an individual strength, as opposed to a learned hard skill. Effective problem-solving involves several skills within the problem-solving category, and each career may require specific problem-solving skills. For example, a marketing professional will need good communication, research, and creativity skills, all of which fall under the problem-solving umbrella.

Why Are Problem Solving Skills Important?

Problem is something hard to understand or accomplish or deal with. It can be a task, a situation, or even a person. Problem solving involves methods and skills to find the best solutions to problems.

Problem solving is important because we all have decisions to make, and questions to answer in our lives. Amazing people like Eleanor Roosevelt, Steve Jobs, Mahatma Gandhi and Martin Luther King Jr., are all great problem solvers. Good parents, teachers, doctors and waiters all have to be good at solving different sorts of problems as well.

Problem solving skills are for our everyday lives.

Why Should You Develop Your Problem-Solving Skills?

Decision-making and problem-solving skills will help you get through life and succeed in your work. Many professionals claim that they are good at it, but what does that really mean? And more importantly, how can you improve? You don't need the

scientific method to get things done. But problem-solving, like any strength or skill, is something you have to work to develop and practice to maintain.

Yes, some people might be more inclined to think in this mindset, but if that's not your natural tendency, don't give up hope! You can actually train your brain to be more solution-oriented. You just need an action plan. It also takes commitment and focus, but eventually, it becomes natural.

Examples of problem-solving skills

- Active listening
- Analysis
- Brainstorming
- Collaboration
- Communication
- Creative thinking
- Creativity
- Data analysis
- Decision making
- Initiative
- Prioritizing
- Research
- Teamwork

Important Problem-Solving Skills

The following are a few of the most important problem-solving skills in the workplace:

1. Decision-making skills

Decision-making skills are an important component of problem-solving as most problems require decisions to be made in order to address and resolve the issue. Good

decision-making skills help professionals quickly choose between two or more alternatives after evaluating the pros and cons of each. Essential skills that fall under this skill category include intuition, reasoning, creativity, and organization.

2. Communication skills

In order to be an effective problem solver, you must be able to successfully communicate the problem to others as well as your recommendations for a solution. Proper communication can ensure solutions are effectively carried out and that everyone is on the same page regarding an issue. Good communication skills necessary to solve problems include active listening, verbal communication, written communication, receiving and giving feedback, and respect.

3. Collaboration

Collaboration skills are essential to solving problems as they allow you to work well with others towards a common goal. Nearly all workplace settings require some level of collaboration, making it an essential skill to have for every professional. Good collaboration skills ensure that communication is open, problems are addressed in a cooperative manner, and group goals are placed ahead of personal goals. Important collaboration skills to have in terms of problem-solving include emotional intelligence, curiosity, conflict resolution, respect, and sensitivity.

4. Open mindedness

Being open minded is another important component of strong problem-solving skills, as you must be able to look at things from different angles and consider alternatives when necessary. Open mindedness is essentially the willingness to look at things from a different perspective and consider new ideas. Characteristics of an open-minded person include curiosity, acceptance, eagerness to learn, and awareness.

5. Analytical skills

Nearly all problem-solving requires some level of analysis, whether it be simply analyzing the current situation to form a solution or the analysis of data and research related to the problem. Analytical skills allow an individual to better understand an issue and come up with effective solutions based on evidence and facts. Analytical skills that come in hand during the problem-solving process include critical thinking, research, data analysis, troubleshooting, and forecasting.

Principles for teaching problem solving

- **Model a useful problem-solving method.** Problem solving can be difficult and sometimes tedious. Show students by your example how to be patient and persistent and how to follow a structured method, such as Woods' model described here. Articulate your method as you use it so students see the connections.
- **Teach within a specific context.** Teach problem-solving skills in the context in which they will be used (e.g., mole fraction calculations in a chemistry course). Use real-life problems in explanations, examples, and exams. Do not teach problem solving as an independent, abstract skill.
- **Help students understand the problem.** In order to solve problems, students need to define the end goal. This step is crucial to successful learning of problem-solving skills. If you succeed at helping students answer the questions “what?” and “why?”, finding the answer to “how?” will be easier.
- **Take enough time.** When planning a lecture/tutorial, budget enough time for: understanding the problem and defining the goal, both individually and as a class; dealing with questions from you and your students; making, finding, and fixing mistakes; and solving entire problems in a single session.
- **Ask questions and make suggestions.** Ask students to predict “what would happen if ...” or explain why something happened. This will help them to develop analytical and deductive thinking skills. Also, ask questions and make suggestions about strategies to encourage students to reflect on the problem-solving strategies that they use.

- **Link errors to misconceptions.** Use errors as evidence of misconceptions, not carelessness or random guessing. Make an effort to isolate the misconception and correct it, then teach students to do this by themselves. We can all learn from mistakes.

Woods' problem-solving model

1. Define the problem

- **The system.** Have students identify the system under study (e.g., a metal bridge subject to certain forces) by interpreting the information provided in the problem statement. Drawing a diagram is a great way to do this.
- **Known(s) and concepts.** List what is known about the problem, and identify the knowledge needed to understand (and eventually) solve it.
- **Unknown(s).** Once you have a list of knowns, identifying the unknown(s) becomes simpler. One unknown is generally the answer to the problem, but there may be other unknowns. Be sure that students understand what they are expected to find.
- **Units and symbols.** One key aspect in problem solving is teaching students how to select, interpret, and use units and symbols. Emphasize the use of units whenever applicable. Develop a habit of using appropriate units and symbols yourself at all times.
- **Constraints.** All problems have some stated or implied constraints. Teach students to look for the words only, must, neglect, or assume to help identify the constraints.
- **Criteria for success.** Help students to consider from the beginning what a logical type of answer would be. What characteristics will it possess? For example, a quantitative problem will require an answer in some form of numerical units (e.g., \$/kg product, square cm, etc.) while an optimization problem requires an answer in the form of either a numerical maximum or minimum.

2. Think about it

- **“Let it simmer”**. Use this stage to ponder the problem. Ideally, students will develop a mental image of the problem at hand during this stage.
- **Identify specific pieces of knowledge**. Students need to determine by themselves the required background knowledge from illustrations, examples and problems covered in the course.
- **Collect information**. Encourage students to collect pertinent information such as conversion factors, constants, and tables needed to solve the problem.

3. Plan a solution

- **Consider possible strategies**. Often, the type of solution will be determined by the type of problem. Some common problem-solving strategies are: compute; simplify; use an equation; make a model, diagram, table, or chart; or work backwards.
- **Choose the best strategy**. Help students to choose the best strategy by reminding them again what they are required to find or calculate.

4. Carry out the plan

- **Be patient**. Most problems are not solved quickly or on the first attempt. In other cases, executing the solution may be the easiest step.
- **Be persistent**. If a plan does not work immediately, do not let students get discouraged. Encourage them to try a different strategy and keep trying.

5. Look back

Encourage students to reflect. Once a solution has been reached, students should ask themselves the following questions:

- Does the answer make sense?
- Does it fit with the criteria established in step 1?
- Did I answer the question(s)?
- What did I learn by doing this?
- Could I have done the problem another way?

- **Don't settle for the first, most obvious solutions**

Because problem-solving strategies often need to be found and implemented quickly, it can be tempting to use the first solution that comes to mind. But is it the most innovative? And does it have the ability to solve the problem permanently? You don't have to ignore or reject the first strategy that comes to mind, but be willing to park it until you've completed your problem-solving steps and have considered the alternatives.

- **Consider all stakeholder interests**

Knowing the stakeholders affected by the problem you're working hard to solve is an important step that should never be overlooked. For example, if a project management tool crashes, you'll quickly realise that the teams reliant on this tool are affected. But did you consider external stakeholders, service providers and remote workers? What about past projects that need to be reported on? Create a list of all affected people and parties, even if they're only marginally affected.

- **Efficient testing and learning**

Be prepared to test the best problem-solving strategies efficiently and learn from what is applied. Document the process from beginning to end to understand what works, what doesn't, and the point at which solutions failed to solve the problem. Having comprehensive documentation will be beneficial when you do find the right solution, and will serve as a valuable guide for colleagues and teams who may later face the same challenges.

- **Engage the best people**

When you've found the best problem-solving strategy for the task at hand, know how to engage the best people and resources to resolve the problem. The best skills may come from an internal department, from external contractors or freelancers or from a

combination of both. Knowing how and when to engage the best people is a key problem-solving skill.

How to Enhance Your Problem Solving Skills

Most people believe that you have to be very intelligent in order to be a good problem solver, but that's not true.

You don't have to be super smart to be a problem solver, you just need practice.

When you understand the different steps to solve a problem, you'll be able to come up with great solutions.

1. Focus on the Solution, Not the Problem

Neuroscientists have proven that your brain cannot find solutions if you focus on the problem. This is because when you focus on the problem, you're effectively feeding 'negativity,' which in turn activates negative emotions in the brain. These emotions block potential solutions.

I'm not saying you should 'ignore the problem,' instead, try to remain calm. It helps to first, acknowledge the problem; and then, move your focus to a solution-oriented mindset where you keep fixed on what the 'answer' could be, rather than lingering on 'what went wrong' and 'who's fault it is'.

2. Adapt 5 Whys to Clearly Define the Problem

5 Whys is a problem solving framework to help you get to the root of a problem.

By repeatedly asking the question "why" on a problem, you can dig into the root cause of a problem, and that's how you can find the best solution to tackle the root problem once and for all. And it can go deeper than just asking why for five times.

For example:

If the problem is “always late to work”...

- **Why am I late to work?**

I always click the snooze button and just want to go on sleeping.

- **Why do I want to go on sleeping?**

I feel so tired in the morning.

- **Why do I feel tired in the morning?**

I slept late the night before, that’s why.

- **Why did I sleep late?**

I wasn’t sleepy after drinking coffee, and I just kept scrolling my Facebook feed and somehow I couldn’t stop.

- **Why did I drink coffee?**

Because I was too sleepy at work in the afternoon, not having enough sleep the night before.

So there you see, if you didn’t try to dig out the root of the problem, you may just set a few more alarms and have it beep every five minutes in the morning. But in fact, the problem you need to solve is to quit Facebook surfing endlessly at night so you’ll feel more energetic in the daytime, and you won’t even need coffee.

3. Simplify Things

As human beings, we have a tendency to make things more complicated than they need to be! Try simplifying your problem by generalizing it.

Remove all the details and go back to the basics. Try looking for a really easy, obvious solution – you might be surprised at the results! And we all know that it’s often the simple things that are the most productive.

4. List out as Many Solutions as Possible

Try to come up with ‘ALL POSSIBLE SOLUTIONS’ – even if they seem ridiculous at first. It’s important you keep an open mind to boost creative thinking, which can trigger potential solutions.

Coming from 10 years in the corporate advertising industry, it is drummed into you that ‘No idea is a bad idea’ and this aids creative thinking in brainstorming and other problem-solving techniques.

Whatever you do, do not ridicule yourself for coming up with ‘stupid solutions’ as it’s often the crazy ideas that trigger other more viable solutions.

5. Think Laterally

Change the ‘direction’ of your thoughts by thinking laterally. Pay attention to the saying,

‘You cannot dig a hole in a different place by digging it deeper.’

Try to change your approach and look at things in a new way. You can try flipping your objective around and looking for a solution that is the polar opposite!

Even if it feels silly, a fresh and unique approach usually stimulates a fresh solution.

6. Use Language That Creates Possibility

Lead your thinking with phrases like ‘*what if...*’ and ‘*imagine if...*’ These terms open up our brains to think creatively and encourage solutions.

Avoid closed, negative language such as ‘*I don’t think...*’ or ‘*But this is not right...*’.

7. Creativity

Problems are usually solved either intuitively or systematically. Intuition is used when no new knowledge is needed - you know enough to be able to make a quick decision and solve the problem, or you use common sense or experience to solve the problem. More complex problems or problems that you have not experienced before will likely require a more systematic and logical approach to solve, and for these you will need to use creative thinking. See our page on Creative Thinking for more information.

8. Researching Skills

Defining and solving problems often requires you to do some research: this may be a simple Google search or a more rigorous research project.

9. Team Working

Many problems are best defined and solved with the input of other people. Team working may sound like a 'work thing' but it is just as important at home and school as well as in the workplace.

10. Emotional Intelligence

It is worth considering the impact that a problem and/or its solution has on you and other people. Emotional intelligence, the ability to recognize the emotions of yourself and others, will help guide you to an appropriate solution.

11. Risk Management

Solving a problem involves a certain amount of risk - this risk needs to be weighed up against not solving the problem.

12. Decision Making

Problem solving and decision making are closely related skills, and making a decision is an important part of the problem solving process as you will often be faced with various options and alternatives.

13. Mine Data

Knowing how to read, interpret and use available data will be a valuable tool in solving the problems you face in your career. Data often presents the factual information or statistics required for developing a solution, so always exploit it if available. Understanding how to mine data also involves knowing how to translate and share it with colleagues and stakeholders, who, once understanding it, may contribute to a fast and effective solution.

14. Constructive Debate

Arguing for and against a particular problem-solving strategy is a useful way of determining the pros and cons of each, and deciding which solution you'll implement first. Debating options also requires you to research and develop levelled arguments for each strategy, a valuable technique in selecting the best solution and optimising as you go.

15. Identify Problems Before They Occur

Someone with brilliant problem-solving skills (and very likely the respected leaders you admire) will have, over time, developed the ability to identify problems before they occur. While this doesn't mean they can always be avoided, it does allow more time to establish and implement the best problem-solving strategy. This special skill also relies on extraordinary knowledge of an organisation, its values and processes, the industry it exists within and broader market trends.

16. Learning from Mistakes

In all areas of your professional life there is the potential to make mistakes, having tried something that, despite your effort and consideration, fails to achieve the desired outcome. Making mistakes to develop your problem-solving ability is no different, and they remain an important way of learning how to improve process and practice.

17. Great Communication Skills

Most great problem solvers are likely to have excellent communication skills. These skills enable you to effectively detail what the problem is, engage the right and most valuable people, and keep them connected to the task at hand from start to finish. So if you're looking to develop your problem-solving strategies, we highly recommend working on your communication skills as well.

Creativity in Problem-Solving

The World Economic Forum predicted that by 2025, **critical thinking, problem-solving, and creativity would rank among the most important soft skills to have in the workplace**. Soft skills are used every day in the workplace, and developing your skillset will make you stand out to employers. Here are some of the ways that soft skills can help in the workplace:

- Increase in productivity – tasks will be completed more efficiently.
- Improved teamwork skills – employees will work better together.
- Better workplace communication – smoother operation of the business as a result of effective communication and teamwork.
- Better employee satisfaction – employees that communicate and work collaboratively will often have increased job satisfaction.

It's not just in the office or classroom that soft skills are important though. Outside of the workplace, soft skills are essential for creating lasting bonds with other people and communicating your needs and desires. **Problem-solving and decision-making techniques** can also be applied professionally and personally.

1. What is creativity?

Creativity is an essential soft skill – but what is creativity? Essentially, creativity is the ability to consider a task or a problem in a different way. Similarly, it's the process of using your intuition to try and formulate new ideas. It can help you solve complex problems and find different, more interesting ways to approach various tasks.

Having this openness to innovation and mental flexibility can take some time and effort. You can find out more about how you can adopt a creative mindset and overcome resistance to innovation with our Creativity and Innovation course.

Understanding creativity is about knowing how and when you can express and use this skill in the workplace. In addition, employers will take notice of candidates who can and have used it for different ways of problem-solving.

2. Why is creativity important?

Being creative is often essential to problem-solving, both in and out of the workplace. Creative problem-solving will prove you have the ability to approach an issue from every angle, rather than a simple linear, logical approach.

With such a large number of new technologies and new ways of working appearing at a rapid pace, companies have to tap into the creative energy of their employees in order to grow. Creative problem-solving will help teams to generate innovation – from uncovering new approaches to problems, developing new products, or improving existing processes.

Ways to improve your problem-solving skills

1. Keep track of your ideas.

Write it all down. Carry a small notebook around with you; keep a pad of paper at your bedside table; have post-its at your desk; keep a blog library. Whatever your technique is, give yourself the opportunity to jot things down. They're each a good problem-solving strategy in the long run.

Why? Problem solvers know that they need to *recognize patterns, especially from the past*, so journaling and the act of writing down can help to retain memories and experiences. Additionally, the habit of writing things down rather than simply *thinking* about this is a power that needs to be exercised.

2. Have the right mindset.

Attitude is everything; it's simple cognitive psychology. How you psychologically approach a problem is linked to how you view the solution. At the most foundation level, if you believe there is a solution there *is* a solution.

Problem solvers are playful, curious and inquisitive and choose to have a positive outlook and use positive language. If you think something is impossible, it becomes impossible. Likewise, if you think something is possible, it becomes possible. Your outlook frames everything so choose it actively and wisely. Doing just that is an action plan of its own.

3. Ask for feedback.

Problem-solving is based on trial and error. A key part is the learning and growth process. While you might not be able to A/B test your career, you can learn a great deal about your approach from your peers, direct reports, business partners, and superiors. How? Ask for feedback.

Pro Tip: Make feedback a part of who you are professionally. Ask for it and give it all the time, not just at year-end or mid-year in your company's automated performance management system.

4. Get good at making decisions, even if you're admittedly lukewarm on your choice.

Decision-making is a skill in itself and also a problem-solving strategy when you can actually make choices. That's partly because making an important decision can be daunting and pressure-filled. A key piece of problem-solving is coming up with an idea for a solution and running with it. If it doesn't work, you pivot. The point is to get comfortable driving to — and actually making — a decision.

5. Consider a different perspective.

What's your move if you're faced with a decision but don't like the choices you have in front of you? Find another option. Sounds obvious, right? For a seasoned problem solver, it might seem like second nature but actually this is a conscious choice. To grow this ability try this: Before every choice you make commit to considering another perspective *then* choosing what you want to do. Start small. When choosing what type of cereal to buy at the grocery store, before you pick up your usual low-sugar, fiber-rich go-to, ask yourself what your seven-year-old would do. What about Fruity Pebbles would make her want you to buy it? You don't necessarily have to buy Fruity Pebbles, but working to consider other perspectives when making seemingly innocuous choices will help you grow your ability to shift and consider different perspectives more seamlessly.

6. Have mentors and role models.

Mentorship and role models are important for any career, but for a problem solver they take on another component: *modeling*. With a good mentor or role model, rather than having to *test* a specific choice or path a problem solver will learn all she can about the career and choices of a role model or mentor, ask questions when possible, and then make decisions for herself with the knowledge of these learnings. Employing the scientific concept of modeling in your life and career allows you to incorporate learnings from the experiences of others without having to re-create the wheel. (Though, of course, there are some things you have to try for yourself!)

7. Have some fun.

Playfulness is a key characteristic of being a problem solver; no idea is too silly, and there's fun in everything. So have fun, know how to let loose, and don't take everything seriously. Talk about a problem-solving strategy!

8. Have rituals but know when to break habits.

Another problem-solving method is to slowly steep tea in the morning. Or grind your own coffee. Go to a yoga class late Sunday afternoon to reset your mind for the week ahead. Have dinner with friends on the second Friday of every month. Establish things that you like to do and do them regularly. This helps you train your brain for regularity and create moments in work and life that you look forward to.

But also know when and how to regularly change your environment and break habits. Whether it's changing things around in your home or workspace every now and then, giving yourself a change of scenery in the middle of the day, or going on a weekend getaway and missing the monthly dinner with friends, changing your scenery is essential. This trains your brain to be open to new ideas and breaking the routine.

9. Use (and create) diagrams.

As humans, we are visual creatures. But along with visuals like diagrams and drawings, your ability to communicate something in a clear, visual manner highlights your understanding of it and can help you reaffirm your belief in it. Employing diagrams in your work and life is a great problem-solving method. Try this out by drawing a scenario.

10. Employ visioning.

This might be the life coach in me, but here's the truth: Visioning is an extremely powerful tool and technique. You cannot accomplish something you cannot envision. Feel too squishy? Consider that babies develop motor skills through a process of observation and visualization over time. It's only after they are able to *visualize* themselves picking up objects after careful observation that they can do it themselves. But visioning isn't just for babies. We all use it when we read books, listen to a colleague tell us about her vacation in Greece, or when we imagine the future or remember the past.

A little unsure where to start? Try simply envisioning a more vivid picture when reading something. Along with imagining the scene, consider what a room or person smells like; what food tastes like; the small movements in someone's mouth as she considers a comment. You've started to vision!

11. Ask solution-oriented questions.

We know we should ask questions but are we asking the *right* kinds of questions to help us solve problems? Questions are a truly incredible part of our lives. When you stop and think of it, so much of our daily human interactions are based on questions. We communicate via questions with our internal dialogue and others on anything from what we want to have for lunch, if we want to buy a cup of coffee or stick to the free coffee in the shared kitchen, when we should make a doctor's appointment, what to wear on Tuesday that will work for happy hour after the office and what manner to phrase question to our boss (#meta).

It's easy to get lost in what feels like a sea of meaningless questioning. So take back control! Ask and frame questions in a solution-oriented manner? How? By asking *how* and *what* do these words help build problem-solving skills? *What* advantage to *why* questions do they offer? They challenge you to find solutions and expand your thinking by going beyond what we already or normally believe true.

12. Or if you prefer a more scientific term, allow things to incubate.

An early idea may be the tip of the iceberg of a more complex idea. Give ideas time. Call it rest, incubation, giving it time to percolate — whatever language you like.

Pro Tip: For those who feel uncomfortable with simple rest, first try to get comfortable with it. But if you want more guided reflection, before nodding off to sleep, pose a question or two to yourself. Then reflect on this same question when you wake.

13. Frame a problem as a question.

When you're faced with a problem — communicating a less than ideal campaign performance, finding more dollars for an urgent project, spending an additional \$50,000

just allocated to your team, creating a website that works for both new and current customers, finding a new speaker on short notice — reframe it. Rather than seeing only the problem, begin to see it as a big question that you need to answer. For instance, "How can I spend an extra \$50,000 in Q4?" Then come up with as many solutions as possible for this. Remember to take your playful mindset and that no ideas are "bad."

Pro Tip: Actually write all this out. You can have two columns of "questions" and "solutions" or two separate pieces of paper.

14. Make reflection a habit.

What's happening? What's going well? What do you want? Bring reflection into your life daily. If you already practice mindfulness or meditation this might just be an extension of that, but if you don't start in manageable steps. Spend 5 minutes on your commute *to* work considering what you want your day to be like. For five minutes on the way home reflect on how your actual day compared. Evolve this to include any questions or topics that matter to you.

15. Ask for help.

You can't do everything alone. And frankly, even if you *could*, should you? No. Delegating, outsourcing and tapping experts are all things for a reason. Group problem-solving can be key because problem solvers revel in different perspectives and constantly want to consider things from a new vantage point. It's no wonder that they solicit other ideas. Enlist a trusted colleague or mentor, hire a coach or talk with a loyal and non-judgmental friend. A spouse and best friend are great, but the key here is to find someone who will offer you an unbiased and completely open-minded outlet or perspective.

16. Take (calculated) risks.

A creative solution won't be achieved or successful without some level of risk. What's the best way to get comfortable with risks? Start taking them. Whether it's traveling to another country, eating alone at your favorite restaurant on a Friday night, or telling

your sensitive colleague that the apple she enjoys at her desk every afternoon at 3:05 p.m. is driving you insane. Taking risks is a part of the mental framework of a problem solver so find something that works for you and do it.

17. Set and measure goals.

Establishing desired outcomes is a key part of a successful solution to a problem. And like everything, this must be refined and infused to all areas of life. To get better at this set and measure goals in your own professional (and personal) life.

Pro Tip: Make sure they're measurable. And then actually measure them. Don't say you want to lose weight but, rather, commit to losing five pounds in three months. Then assess where you are in three months. Rather than saying you want to learn a new language, decide what progress you want to have achieved in six months (say the number of vocabulary words, practice conversations, etc.) and what program or method you plan on employing (a tutor, in-person or online classes, self-study, etc.).

“The measure of success is not whether you have a tough problem to deal with, but whether it is the same problem you had last year”

John Foster Dulles, Former US Secretary of State.

ADDITIONAL RESOURCES

- 1. 10 ways to improve your problem solving skills.**
[10 Simple Ways To Improve Your Problem Solving Skills | CMOE](#)
- 2. Problem Solving Skills - 9 Keys to Succeed**
[Problem Solving Skills – 9 Key Steps to Succeed – racticalongevity.com](#)
- 3. Problem Identification Form**
[Problem identification process](#)

5. USE OF WEB-BASED SOURCES FOR ADULT SELF-LEARNING AND PROFESSIONAL DEVELOPMENT

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Abstract

How can digital technologies, online communication and virtual learning communities be used for adults' professional development and for increasing their chances to get employed? This overarching question guided this chapter. In this chapter, the role of digital technologies and virtual learning communities in facilitating adults' self-learning and in healing the digital divide is discussed. Drawing on practices from various contexts, this chapter attempts to offer some directions to help adults become self-directed lifelong learners and find solutions in the face of technical problems. The idea behind this effort is that adults who are self-motivated and self-directed are highly likely to learn independently in this digital era in which a vast amount of information emerges every day. The chapter concludes with some final remarks on the growing importance of computer-related skills both in the workplace and in job seeking.

Introduction

Various forms of recent technologies have become a part of older adults' everyday lives. The use of desktop computers, portable devices and the Internet in every realm of life has increased dramatically in recent years. These devices are now used for various things from teaching to healthcare (Barbarosa Neves & Vetere, 2019; Henshaw, Clark, Kang & Ferguson, 2021). There is an undeniable fact that internet usage among older adults has been on a gradual rise (Hunsaker & Hargittai, 2018; Nguyen et al., 2020), whereas the number of adult digital technology users are still far behind the young people and this is partly due to the adoption and acceptance level in the older population (Li & Luximon, 2016). In a similar fashion, Nguyen and her colleagues (2020) looked into how the pandemic changed individuals' use of digital communication methods and they have found that the youngest quartile of their study group was more likely to have increased any type of online communication compared to other age groups. There are many reasons behind this, for example, older adults are reportedly show fewer interests

(Morris, Goodman & Brading, 2007). Fear of making mistakes and having a strong sense of social responsibility could also be reasons for adult's reluctance to use smart digital devices (Knowles & Hanson, 2018). Whatever the reason may be, it is of vital importance to arouse positive feelings among older adults towards digital technologies (Li & Luximon, 2016). Benefits of self-learning are evident for adults, but this does not necessarily mean that they never need teachers. Yet, adults who are self-motivated and self-directed are less likely to need someone to lead them over the threshold. This is often necessary when adult learners cannot proceed on their own because of the vast amount of information emerging everyday (Taylor & Hamdy, 2013, Yoo, 2021).

With the increasing role of the Internet in every realm of life and in all age groups, the importance of online communication is also becoming the norm (Hartley & Chatterton, 2015). According to Pew Research Center (n.d.), Internet usage is much less prevalent among seniors of society in comparison to young adults. In fact, some groups of older adults, who are wealthier and more highly educated, report using various technologies at rates similar to younger adults (Pew Research, 2017). Still, there exists a considerable digital divide between young adults and seniors. Today, online communication is about enhancing adults' social connectivity as well as about improving their well-being (Hage, Wortmann, van Offenbeek & Boonstra, 2016). Having said that, it does not necessarily mean that all the effects of online communication on adults are positive such as enhanced social connectivity. The effect of adults who use online communication experiences seem to be varied, that is, positive or non-existent for some adults and negative for some others. Compelling evidence to support this argument is still needed (Hage et al., 2016).



Figure 1. Digital/Social Connectivity.

Before taking the discussion any further, it can be helpful to look into what digital communication really is and how it is becoming indispensable in our life. Online communication refers to any method of communication between individuals via electronic and internet technologies (Gomez-Baya, Rubio-Gonzales & Gaspar de Matos, 2019). The scope and the options for digital communication is getting varied and from social networks to video conferencing, there is a wide array of options (Hartley & Chatterton, 2015).

Digital communication supplies people with quick access to others on an unparalleled pace. A large number of businesses increasingly prefer using email or mobile app notification over a phone call because of the ease email and mobile apps bring in terms of tracking the record of the message. In some other situations speaking to someone face-to-face or remotely through a video call can solve a situation faster than multiple emails (Sarokin, 2015). Additionally, in this age of digital technology, various types of interactive technologies and digital channels such as social media become prominent in contributing to both individual's lives and organization's activities.

Given the importance of online communication summarised above, it is particularly important for adults to have essential digital skills for employability and professional development. Some of the advantages digital communication offers have quickly changed how the tasks are done at a workplace. For instance, immediate delivery of the information to the recipient changes the behaviours and expectations of the senders as well as the recipients (Derks & Bakker, 2010).



Figure 2. Digital Workplace.

The Role of Online Communication to Promote Self-Learning among Adults

Online communication helps older adults in many ways, such as increasing efficiency at work, lifelong learning, professional development, employability (Barbosa Neves, Franz, Judges, Beermann & Baecker, 2017; Henshaw, Clark, Kang & Ferguson, 2012; Morato, Sanchez-Cuadrado, Iglesias, Campillo, & Fernández-Panadero, 2021). Li, Ornstein, Li and Liu (2021) investigated the effect of the COVID-19 pandemic on older adults with respect to technology use and daily and healthcare needs and found that the odds of adopting a new technology diminishes with increasing age and decreasing income levels. Nguyen and her colleagues (2020) looked into different age groups'

online communication during the pandemic by collecting data from over one thousand adults. A strong rise in online communication. The data showed that almost half of the participants used text messaging more often and around one third of the respondents increased their voice calls and social media use. Nearly one quarter of the respondents more frequently used email. Overall, when all modes of digital communication taken together, less than half of the respondents increased their digital communication with no decrease in any of the modes.

Digital skills now form an indispensable entry requirement for most of the online job vacancies. Online communication and digital skills are not only essential for employability but also to promote career progression. Job seeking older adults need to develop their digital skills to maximise their chances in an increasingly digital market (Nania, Bonella, Restuccia & Taska, 2019). Either for increasing their chances to get employed or for self-improvement purposes, adults need to develop and apply online communication skills to support their self-learning and to improve their quality of life (Lee, Chen & Hewitt, 2011).

Many workplaces and businesses are moving incessantly towards adopting cloud computing – a term which is used to mean accessing ICT services across the Internet. In Cloud computing, the data processing takes place “in the cloud,” so the user does not need a high-end computer. Cheaper forms of computer, and other portable devices such as tablet computers can do the job thanks to the cloud via the Internet (Richards, McGreal, Stewart & Sturm, 2014).

The introduction of cloud computing and other forms of digital technology into the workplaces has immensely converted how many jobs are done. The growing role of digital skills in the workplace grows along with the demand for workers with computer-related skills and the case of older workers deserves to attract particular attention (Lee, Czaja & Sharit, 2009). Given that life expectancy has been increasing for a long time now, using online communication modes help make older adults valuable contributors by boosting company productivity through their experience and digital skills (Barbosa Neves & Vetere, 2019). Therefore, older adults should be able to use online communication tools effectively and should ensure digital inclusion not only to achieve

their employability potential, but also to promote career progression (Kispeter, 2018; Nania, Bonella, Restuccia & Taska, 2019).



Figure 3. Social Inclusion.

Cloud technology is increasing the amount of data which people from different parts of the world transfer and store across borders, and this benefit is also a source of concern due to some issues in areas of data security and privacy. Despite the advantages mentioned above, many privacy challenges and risks are inherent in cloud computing. Furthermore, there are concerns about the liability of service providers in the existing terms and conditions of standard cloud computing contracts due to largely lack of well-defined open standards.



Figure 4. Phishing.

Adults, just like teenagers, increasingly adopt cloud technologies and they help them engage in social activities, stay in touch with their relatives and friends. These technologies also help them live independently in society. On top of that, these technologies help adults feel more productive through virtual interactions event after their retirement. Today, many providers offer users cloud advantages if they open a free account. Adults who open and use the email services from one of these providers will have free access to the cloud computing services. The cloud can supply adults with access to the increasing number of free open education resources as well as open-source apps allowing social interaction, to edit content, to compute, and to carry out many similar functions.



Figure 5. Computer-related skills.

Virtual Learning Communities and Professional Development

In very simple terms, professional development practices aim to develop an employee's skills related to the profession he or she is performing, and therefore such practices are usually aimed at adult learners. The professional development activities are expected to encourage inquiry, reflective thinking, collaboration and cooperation among members of learning communities, and to provide continuous support for lifelong learning. In many cases of traditional or face-to-face professional development programs or activities which are generally provided in a form of one-shot conferences, seminars or workshops (Hill, 2009; Tseng, 2003), the participants may not be provided with sufficient time for reflection or inquiry due to the inadequate time allotted. What's more, these face-to-face professional development programs are time and location bound so on the part of the learners there could be a need to travel and stick to these prescheduled activities. On the other side of the coin, the rapid development of technology and accordingly web-based tools and the creation of social networks have

created a fertile environment for professional development where people can easily access virtual learning communities at times and places convenient for them. More importantly, people have started to build their own formal or informal professional learning communities on the Internet (Ferriter, 2009).

In the past few years, web-based tools have come to serve for more interactive collaboration. Wikis, blogs, podcasts, and the like have emerged and given people the opportunity to both contribute to and collaborate in online learning environments. At the most vigorous sites, particularly adult learners have created their own professional learning communities in which they can contribute to content, write a blog on specific topics, keep themselves informed of the latest news about professional development events and trends online, and get into interaction in discussion forums with professionals working in the same field or having common interest (Ferriter, 2009).

In parallel with the advancement of technological tools and the growing enchantment for e-learning, many professional development practices are designed using a variety of Computer-Mediated Communication (CMC) tools that excite learners who need flexibility. Moreover, CMC provides both asynchronous and synchronous communication. In asynchronous learning environments, the postings and information are always there to be reached. For this reason, the trainees have more time to reflect on the discussion topics, elaborate on their responses, and post them whenever they want (Haythornthwaite & Andrews, 2011; Romiszowski & Ravitz, 1997). E-mails, discussion boards, bulletin boards, blogs, and wikis can be given as examples to asynchronous communications. On the other hand, synchronous communications are considered as live meetings in which participants get into online interaction with peers in real time. For instance, using an online chat room, they post and receive the messages immediately. The participants can also see each other via webcams and speak through a microphone, which allows for voice communications as well. In synchronous environments, the communication is achieved simultaneously and can be considered just like as face-to-face classroom discussion. Audio conferencing, video conferencing, or instant messaging through Skype can be given as examples to synchronous communication.



Figure 6. Computer-Mediated Communication Tools.

The use of web-based tools cannot, of course, totally fill the shoes of face-to-face professional development, however it could possibly bolster effective professional development practices and make them even more effective. For instance, using virtual learning communities may lead professional development activities to become more sustainable and job-focused. When an online professional learning community is built to support a particular region's goals and values, participants might contribute to the planning and determining of these goals and sustain a consistent commitment to managing them. The virtual learning community can be also more practical in terms of providing flexible times and places for collaborative learning as well as a worldwide access to experts and resources (Duncan-Howell, 2010). In other words, the existence of technology enhances the opportunities to create networked learning communities and ideas that may not be otherwise easily created and maintained through traditional means of professional development.

Based on the degree of interaction between the trainer and trainees, Kleiman et al. (2000) categorize online professional development as (a) broadcast approaches, (b) self-paced, independent study courses, (c) college lecture course models, (d) tutorial models, and (e) learning community models (pp. 7-8). Broadcast approaches and independent study courses principally refer to online materials or lectures that slightly allow learners

to communicate with one another and the trainer. The college lecture courses have an average degree of interaction as compared with tutorial and learning community models which promote a larger amount of communication between the learners and trainer. All of these approaches can offer effective online professional development practices based on the competencies, needs, and expectations of the attendants. However, according to many researchers, online learning communities serve more appropriately for the purpose of improving professional practices of participants in a supportive context (Cavaalluzzo et al., 2005; Schrum et al., 2005).

Online professional learning communities support the motives and characters of learners who are proficient in self-regulation. A self-regulated adult learner could possibly find his own identity in a digital professional learning community while he is cooperating with others to communicate his experiences and discoveries. Merriam (2001) argues that, “self-learning is part of the identity of adult education and has an impact on practices” (p. 11). The use of internet and web-based tools without time and space constraint is in perfect harmony with the motivations of a self-directed learner. Self-directed adult learners can be more eager to go on participating in the online environment and share their knowledge with those who have newly taken a part in the virtual learning community.

With regard to the advantages of virtual learning communities, Kleiman et al. (2000) make a list of varied benefits. They report that online learning communities have the properties of convenience and cost-effectiveness since the learners can access to resources at anytime and in their own place without travelling. Additionally, in an online learning environment, participants could find more time to reflect on their learning and to interact with other learners. Whenever they wish, they can take their time to read others’ postings more than once, gather thoughts, and organize ideas before giving a response. They are not required to take down what others said before because in online learning settings the activities and discussions are automatically recorded. What’s more, online learning experiences help individuals to come together with others from varied backgrounds, interests, and experiences. These differences add more value to the learning experience and promote high-quality learning. In a nutshell, by the time learners become a member of these online learning communities, to a great extent they

could get rid of the feeling of professional isolation, feel more motivated and become more willing to deepen their learning by reflecting on others' ideas and comments (Xiaojing, Magjuka, Bonk, & Lee, 2007).

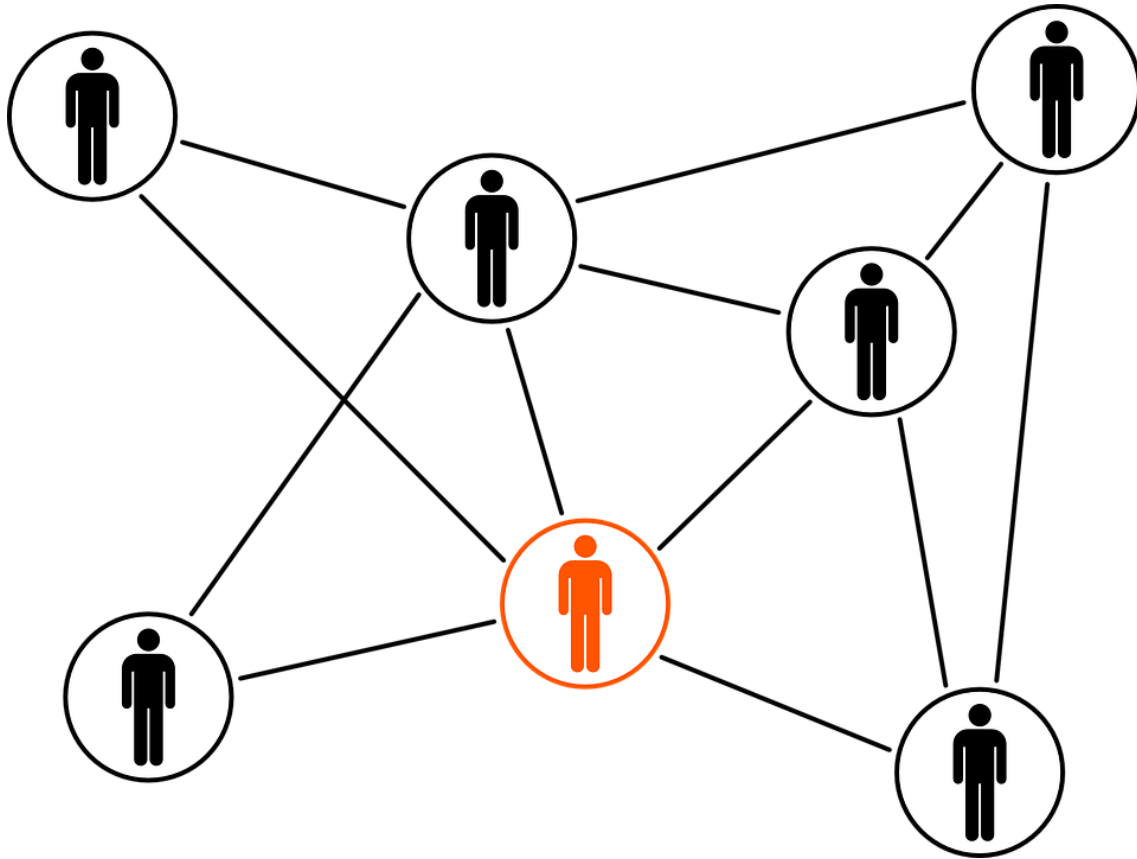


Figure 7. Online Learning Communities.

As a conclusion, web-based technologies can be utilized to build an online collaborative learning community as a venue for individuals' professional development where they can communicate with other professionals in any place at any time. Even the members who hesitate to speak up and ask a question in public can communicate their thoughts by contributing to ideas online or talking with each other in online chat rooms. Possibly, the most prominent dimension of utilizing virtual learning communities is that the participants can receive immediate feedback from experts or peers. Therefore, web-based community members are eager to share experiences with colleagues, are promoted to learn, and will be willing to gain new professional knowledge and skills.

Conclusion

In addition to the developments in the knowledge-based economy, the rapid growth in computer and network technology has created a need for adults to use web-based tools in order to broaden their knowledge and to assure professional development by means of continuous learning. In the context of employment, the existence of online learning opportunities has allowed adults to upgrade their knowledge and skills with respect to their jobs in order to remain up-to-date. Through the generous support of various forms of digital technology, adult online learning experiences have also become social, collaborative, genuine, and flexible. The web-based tools properly appeal to adults' self-regulated learning needs, give them an opportunity to adjust their own learning pace, and foster learning-in-collaboration experiences.

Grounding on the virtual learning communities as one of the forms of web-based communications, this chapter highlights how online communication makes it possible on the part of adult learners to be able to engage in active and collaborative learning with other people living in different regions. It further exemplifies how web-based learning tools facilitate the way for adults to learn more about their jobs and gain the knowledge they need and easily apply it in their current workplace. The chapter also brings up the issue of convenience in taking the advantage of online communication tools without having any constraint on time and location. This flexibility provided by the digital communication tools is suggested to match up with adults' attribute of being self-directed learners. Lastly, the chapter concludes with the notion that the existence of technology increases the opportunities to create networked learning communities and ideas that may not be otherwise easily created and maintained through traditional means of professional development.

ADDITIONAL RESOURCES

1. Virtual Communities and Social Media

<https://www.youtube.com/watch?v=5txst5mOywM>

2. Re-inventing Education for the Digital Age

<https://www.youtube.com/watch?v=ArI6albrkuY>

3. The Online Community-A New Paradigm

<https://www.youtube.com/watch?v=OhOUNsATofU>

4. The Foundations of Online Learning Communities

<https://www.coursera.org/lecture/the-foundations-of-online-teaching/the-foundations-of-online-learning-communities-8VNvK>

6. DIGITAL TECHNOLOGY TO ENHANCE ASL AND SOCIAL INCLUSION

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Abstract

Socially excluded groups are at greater risk of low well-being and poor health. The link between social exclusion and inequality is complex and difficult to participate in society. Today, the digital environment has a major impact on society, not only economically and politically, but also socially. The development of digital tools has affected the opportunities for adult learning and socialization, opening up a wide range of opportunities. Taking advantage of these opportunities requires digital skills and competencies that enable the successful use of digital resources in ASL and social inclusion.

Introduction

In the light of the latest developments in various digital technologies, some experts have announced the onset of the fourth industrial revolution. The digital environment has a major impact on society. The impact is not only economic and political but also social. The ability to connect and perceive the environment digitally allows us to capture information comprehensively and understand and take action more effectively. The potential impact of IT on social inclusion can both enable and jeopardize this process.

In the Recommendations on the Development of Adult Education state (UNESCO, 1977): “Adult education is the entire body of organized educational processes, whatever the content, level and method, whether formal or otherwise, whether they prolong or replace initial education in schools, colleges and universities as well as apprenticeship, whereby persons regarded as adult by the society to which they belong develop their abilities, enrich their knowledge, improve their technical or professional qualifications or turn them in a new direction and bring about changes in their attitudes

or behaviour in the twofold perspective of full personal development and participation in balanced and independent social, economic and cultural development”.

Digital Competence

Nowadays the concept of competence_is widely used in different spheres, while originally it has been used mainly in the context of professional activity.

The term competence is defined as the necessary knowledge, professional experience, understanding in a particular area, issue and ability to apply the knowledge and experience in a particular activity (IGI Global, 2021).

So the key elements of any competence are attitudes, knowledge and skills.

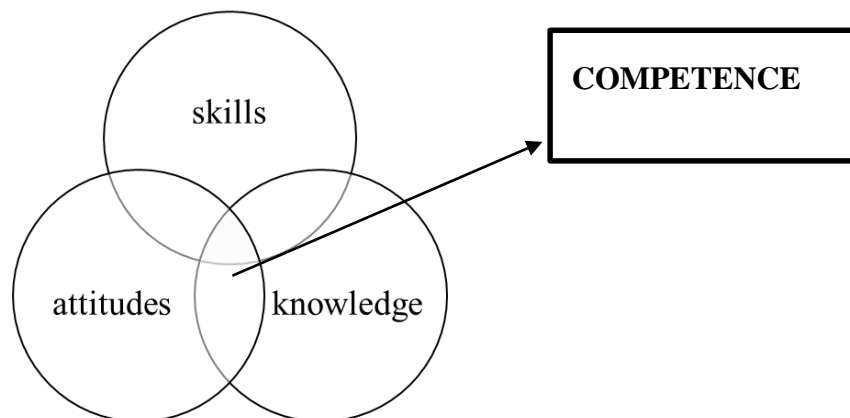


Figure 1 Competence Key Elements

Nowadays the Digital Competence Concept is based on the EU Digital Competence Framework or DigComp.

The European Digital Competence Framework, also known as DigComp, offers a tool to improve citizen's digital competence. Today, being digitally competent means that people need to have competences in all areas of DigComp.

The Digital Competence Framework can help with self-evaluation, setting learning goals, identifying training opportunities and facilitating job search (European Commission, 2021).

The first version of the Digital Competence Framework included the following aspects: Communication, Content creation, Safety, Information and data processing, Problem-solving.

Center for Digital Dannele has developed the Digital Competence Wheel for self-evaluation of digital competence. The purpose of the Digital Competence Wheel is to provide an overview of which digital competences exist and should be improved, as well as concrete inspiration for how to improve the most relevant digital competences.

The Digital Competence Wheel is theoretically based on a major EU research project, DigComp.

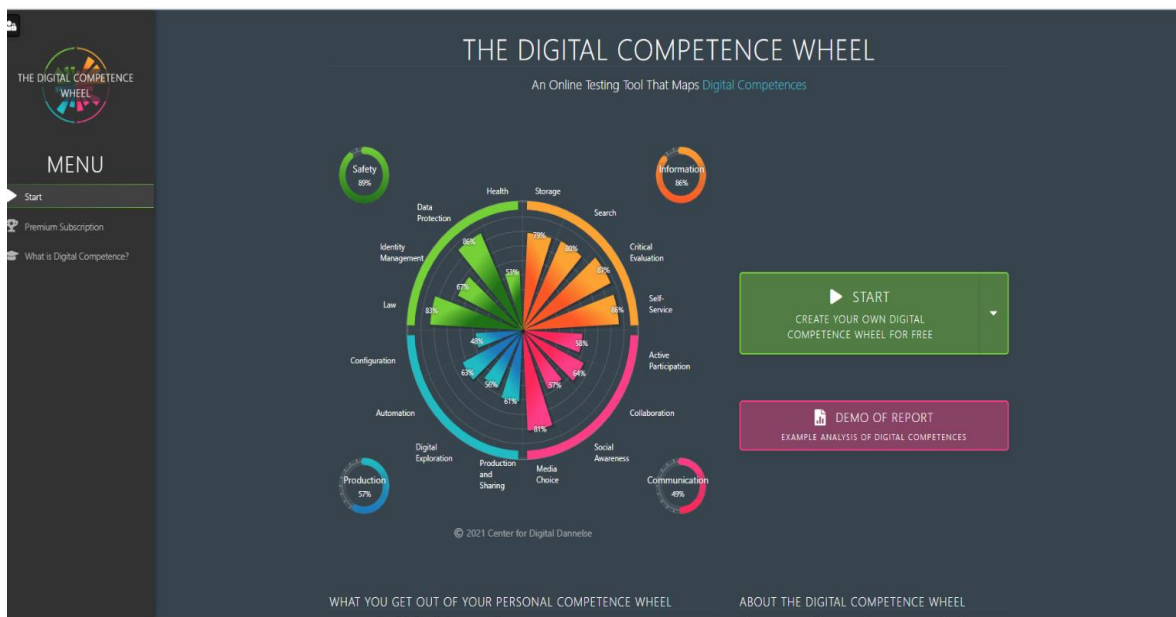


Figure 2 The Digital Competence Wheel (Center for Digital Dannele, 2021)

Digital Competence and Online Interaction

Online interaction is used to describe the communication and collaboration between users and online communities on the web. Online communities often involve members

to provide content to the website and/or contribute in some way. Examples of such include [wikis](#), [blogs](#), [online multiplayer games](#), and other types of social platforms.

Some key examples of online knowledge sharing infrastructures include the following:

- ✓ Wikipedia;
- ✓ Slashdot;
- ✓ Usenet;
- ✓ Etc.

Wikipedia: An online, publicly editable encyclopedia with hundreds of thousands of editors;

Slashdot: A popular technology-related forum, with articles and comments from readers. Slashdot subculture has become well-known in Internet circles.

Usenet: Established in 1980 as a "distributed Internet discussion system", it became the first medium for Internet communities. Volunteer moderators and votetakers contribute to the community.

Etc. (the [Web 2.0](#) is also referred to as the "writable web" for indicating that many people participate to the creation of its content).

Self-Learning for Adults in Digital Age

Self-study has become a key competence for adults living in today's digital age, where social conditions are changing rapidly.

Self-study is the process by which a student takes responsibility for controlling their learning goals and means to achieve their personal goals or perceived requirements in their individual context. An essential feature of this process is that the learner's learning tools and goals are very individual; they are differentiated according to their life situation. The learner (s) themselves are the central and most important feature of their context (Morris, 2019).

Information literacy as a set of integrated abilities encompassing the reflective discovery of information, the understanding of how information is produced and valued and the use of information in creating new knowledge and participating ethically in communities of learning.

According to the UNESCO website, this is their "action to provide people with the skills and abilities for critical reception, assessment and use of information and media in their professional and personal lives.

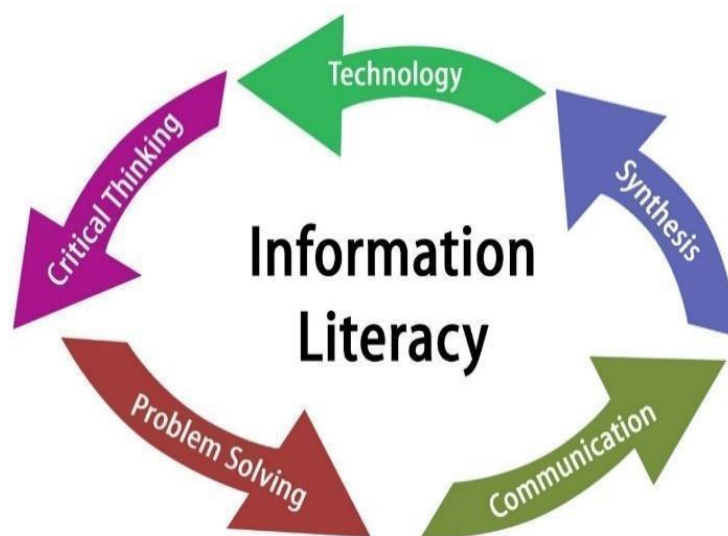


Figure 3 Information Literacy (Kim, 2014)

Information Literacy is the set of skills needed to find, to retrieve, to analyze and to use information. Information Literacy is important as it allows us to cope by giving us the skills to know when we need information and where to locate it effectively and efficiently. It includes the technological skills needed to use the modern library as a gateway to information. It enables us to analyze and evaluate the information we find, thus giving us confidence in using that information to make a decision or create a product.

Everyone needs Information Literacy, as being information literate ultimately improves our quality of life as we make informed decisions (Kim, 2014).

As most people have learned, anyone can write anything in a book or on the Internet. Just because something is in print in any form does not make it accurate and factual. Just because you heard it on television or radio, does not make it true. Just because something was stated persuasively, or convincingly, by your favorite politician, actor, singer, author, or best friend, does not make it fact.

Therefore, it is important to evaluate the sources and information you use for references whether your purpose for using them is for a discussion, an exchange of ideas with a colleague or friend, or information you are using to base your vote for a particular candidate on (Clark, 2018).

Digital literacy is separate from computer literacy. It requires critical thinking skills, an awareness of the necessary standards of behaviour expected in online environments, and an understanding of the shared social issues created by digital technologies.

Digital literacy = digital tool knowledge + critical thinking + social engagement

Digital literacy is necessary to become digital citizens: individuals responsible for how they use technology to interact with the world around them.

Deep learning is the essential component for digital literacy, including six core skills:

- ✓ collaboration (the ability to work collaboratively with others, with strong interpersonal and team-related skills);
- ✓ creativity (being able to weigh up opportunities in an entrepreneurial manner and ask the right questions to generate new ideas);
- ✓ critical thinking (being able to evaluate information and arguments, identify patterns and connections, and construct meaningful knowledge and apply it in the real world);
- ✓ citizenship (the ability to consider issues and solve complex problems based on a deep understanding of diverse values and a worldview);
- ✓ character (traits such as grit, tenacity, perseverance, and resilience; alongside a desire to make learning an integral part of living);
- ✓ communication being able to communicate effectively through a variety of methods and tools to a range of different audiences (Promethean, 2016).

A 2019 study has shown that 89% of people using video conferencing tools feel more connected online. One can only guess at how these numbers from 2019 will spike in 2020, the year of the COVID-19 pandemic. Federal and local governments have asked their citizens to practice “**social distancing**,” a non-pharmaceutical containment measure meant to reduce the spread of viral infection.

Cut off from social interaction, many are turning to technology to maintain social and professional relationships. Teleconferencing programs, group chat apps, and other digital tools are part of everyday life now as we attempt to strike a balance between isolation and connection (Li & Lanani, 2020)

According to EC DigComp Framework the following aspects have to be covered by safety and protection: the device, the data and digital identity, health and the environment. While covering the problem-solving component: technical issues, expression of needs and identifying technological responses, the usage of digital tools and identifying digital competence gaps (Techboomers, 2021).

The Internet may be a source of formal or informal educational knowledge, as seen in online courses (formal) and online encyclopedias and specialized websites (both are informal). Indeed, the Internet is a tremendous resource for self-directed learning, though users must figure out how to differentiate authoritative from non-authoritative sources. Two, the Internet is more than a repository of knowledge, given that it also enables pursuit of certain serious leisure activities (Silverman, 2006). Three, the Internet offers information (as distinct from education) of practical value in pursuing a career in devotee work or serious leisure (Stebbins, 2016).

Some Reflections

Education, formal or informal, adult or self-directed, gives the background knowledge needed to pursue a formative career.

The digital world is also a source of both formal and informal education. For instance, databases containing entire digitized books and issues of periodicals are available to subscribers, whether organizations and their members or non-organized individuals.

Some websites have digital libraries composed of material of interest to subscribers or offered free to the interested public. A wide range of material can now be digitized, including written and printed text; drawings, paintings, and photographs; vocal and instrumental music; plans and blueprints, and videos and films. Using this material might, for example, be required in completing a formal assignment in a university course or it might be needed in the informal educational pursuit of a worker, hobbyist, or career volunteer.

ADDITIONAL RESOURCES

- 1. An interactive online tool that maps Digital Competences**
<https://digital-competence.eu/>
- 2. The digital Competence framework for Citizens**
https://joint-research-centre.ec.europa.eu/digcomp_en
- 3. Important steps to boost traffic to Your Youtube channel**
<https://www.webdhoom.com/important-steps-to-boost-traffic-to-your-youtube-channel/>
- 4. Key Elements of the Communication Process**
<https://bizfluent.com/info-8411786-seven-elements-communication-process.html>
- 5. Digital literacy and why it matters**
<https://www.youtube.com/watch?v=p2k3C-iB88w>

CONCLUSION

The rapid growth in internet has created a need for low skilled adults to learn to use web-based tools in order to broaden their knowledge and to assure professional development by means of continuous learning. Even the professions which may not be predominantly considered as digital require digital competences. There is a need for bridging the gap caused by digitally-excluded adult learners and unemployed citizens. Individuals looking for jobs and low-skilled employees should be encouraged to develop their basic digital skills. Thinking of the rapid development of these technologies makes it clear that there is a vital need to improve adults' digital competences to ensure their successful participation in information society. Such participation is needed not only for personal and professional development but also for many other everyday aspects of life.

Considering the new form of literacy, one can understand how online learning has become of great importance for lifelong learning community. To enhance the development of digital skills, adult learners have some options such as taking free online courses that provide them with some exercises to learn and practice these skills, improving their methods of communicating with others online, increasing their online presence by using social media or following news online, practicing their digital skills by teaching digital skills to others, or following current technology trends continuously. Some available web-based tools appeal adults' self-regulated learning needs, provide them with the opportunity to adjust their own learning pace, and foster learning-in-collaboration experiences.

This handbook aimed to help low-skilled adult learners to gain digital skills of today's world through a self-learning program. The six-chapter handbook provided learners with fundamental information about adult self-learning methods and techniques, digital literacy for adult self-learning, learning apps and software for adult learners, problem-solving skills for ASL, use of web-based sources for adult self-learning and professional development, and digital technology to enhance ASL and social inclusion.

Self-directed learning enables individuals to learn at their own pace and time. Given that process and progress are individual, the first chapter provided information about the most popular adult learning theories and methods and their assumptions in relation to how to make learning more effective. The second chapter elaborated on the term literacy and explained how becoming literate has gone through changes particularly in recent years. The chapter also mentioned the importance of media literacy as an essential concept with examples. The connection of these skills with employability were also discussed. The fourth chapter explained problem-solving skills for ASL. The unit provided learners with some important problem-solving skills and how to improve them. The fifth chapter focused on the online communication and virtual learning communities for adults' professional development. The chapter also had remarks on the growing importance of computer-related skills for employability. Finally, the sixth chapter deals with the association of social exclusion and inequality and the impact of digital environment on economic, political, and social aspects of society.

This handbook provides its readers with information about self-learning for adults in digital age and aims to help them gain basic digital skills. Lack of the knowledge of these skills could cause individuals to become digitally excluded. The new digitalized world needs more active participation of its users for employability and connectivity.

PART II
ADULT SELF
LEARNING

RECOMMENDATIONS

INTRODUCTION

The world has changed so rapidly than it has ever done within the last two or three decades. Technological developments and the rapid use of technological devices, tools, and services have been accelerated particularly during and after the pandemic. While adapting to this change is easy for the younger generation or manageable for middle-aged adults, such adaptation could be just impossible for adults, who have great difficulties in catching up. In the new world, the number and quality of available jobs, how they are carried out, and the skills needed have also been changing. Skills needed for the jobs are predicted to continue to change, which might cause some adults to find them too challenging to continue working. Therefore, education of the adult learners is of great importance due to factors such as the increase in the average length of life, globalization of the world, non-standard work, and technological changes. There are new skillsets for jobs and occupations; people need to constantly update their knowledge; skillsets have become complex and interpersonal skills have gained importance; and individuals need to take the responsibility of keeping their skills up to date.

Lack of skills or low skills of adults in the digital world is caused by several factors such as financial difficulties in accessing technological devices, unfavourable attitudes toward technological services, age-related physical and mental limitations, individual barriers (educational limitations, limited access to technology, and barriers related to the appliances). Developing their skills further through education and training is a limited opportunity for low-skilled adults as they find themselves caught up in a 'low-skills trap'. Therefore, training barriers of this generation should be addressed to help them advance. Given the increased life expectancy and increased ratio of adults in society, the importance of their inclusion in social life is understood better. Social inclusion is now possible through digital inclusion in so many ways.

Adults with low skills, who do not need to use digital technologies actively in their lives, might have extra difficulties caused by the dominant effect of digital technologies in our life. Considering all the digital services offered by not only private companies but also government institutions could make understanding how a lack of knowledge of

necessary skills might affect individuals' life. While using technology was once optional but not an immediate need before, it has been dominating our life and made it necessary to use it for daily needs. Some examples include paying bills, finding our way in an unfamiliar environment, sending and receiving messages from social media tools, following the news, shopping, communicating with friends and family, calculating something, taking and sending photos, replying and forwarding messages, checking the weather forecast, playing games, following social media, etc. Doing all these with the help of technology could save time and energy for people who are good at it. However, adults with low skills may find it so complicated and too difficult to manage. The older age group can enjoy this age period if they benefit from lifelong learning activities that could help them in their daily life. Technology should be accessible for all as a fundamental right since it could help older people to live independently. Therefore, adults with low skills should be provided with learning opportunities to help them gain the necessary skills.

b) Make technology relevant to adults

Things to ponder: Many adults do not utilize digital devices and tools because they do not find them relevant to their context and lifestyle.



Learning opportunities should be made relevant and interesting for adults. One of the barriers to the active use of digital technologies by adults is that they do not find it relevant in their life. Making their learning practical and problem-oriented makes learning more effective for adult learners. Learning opportunities provided for low-skilled adults are still delivered in the classroom context, which causes them to perceive the education received as non-beneficial. Unfortunately, most learning opportunities provided for adults do not always equip them with the skills to help them to compete in the labor market.

There is a need for making adult learning more interesting and relevant for adults with low skills. Self-learning opportunities should be taken into consideration as it makes learning individualized and more effective. Any learning opportunity should be considered from the perspective of how adults learn most effectively. Some examples include but are not limited to self-learning, blended learning, story-based learning, experiential learning, etc.

Adults need holistic and personalized advice and guidance. Making the learning opportunity relevant for them and providing them with various learning options could help to engage more learners. Sometimes they could be lost among many opportunities which they suspect to be beneficial for them. Organizations and institutions offering adult learning opportunities need support not only in identifying their training needs and in understanding which type of training is most appropriate for them. Such guidance could also require collaboration with other institutions and organizations.

c) Build on adults' existing skills

Things to ponder: Many adults do not catch up with technological life, but they have important skills they use in their work and daily life.



Although they are referred to as low-skilled adults, adults already have many skills they utilize in life such as driving a car, finding practical solutions to everyday problems, calculating, communicating with people from different ages and positions, fixing some tools, cooking, etc. They could have various skills other than the specific skills to be taught. Some of them might work in jobs that do not match their abilities. Organizations and institutions providing adults with any kind of trainings should determine and recognize their existing skills and build on them. Determination and acknowledgment of pre-existing skills are also important in terms of the evaluation of the effectiveness of the training provided.

In today's world, many daily routines can be enhanced with the help of technology. Adults can be taught how to integrate their current skills with technological facilities to improve these skills more. For instance, an adult who is good at cooking and likes cooking can be taught how to use the internet to learn more and more about cooking from various cultures and countries. Similarly, finding your way through the navigation and using some tools could be an example of building on existing skills.

d) Provide adults with part-time and modular learning opportunities

Things to ponder: Many adults may find training topics and education requirements too difficult to cope with.



Time could be a limitation for adults either job-related or family-related reasons. Besides, asking for time off for education purposes might not be an easy option for low-skilled adults. Therefore, they could be provided with part-time learning opportunities to overcome this time barrier. Some countries give individuals the right to education and training leave. Policy-makers should consider providing adults with this right by law or collective or bilateral agreements.

Lengthy courses to upskill or reskill may not be manageable for most adults. Research indicates that low-skilled adult workers are less interested in taking lengthy courses. If trainings are modular, they can help learners learn in their own time and shape their learning path accordingly.

e) Make training activities free or affordable

Things to ponder: Due to their responsibilities in their work and private life, many adults may have difficulties in arranging time and money to meet their educational needs.



Having limited financial sources is another important barrier for low-skilled adults, especially if they have low-paid positions with limited opportunities for employer-paid professional development. Therefore, adults should be provided with free and cost-effective training opportunities to improve their knowledge and skills. Organizations and institutions should allocate a budget for such expenses as in the long term it could provide other benefits.

f) Encourage adults to become digital citizens

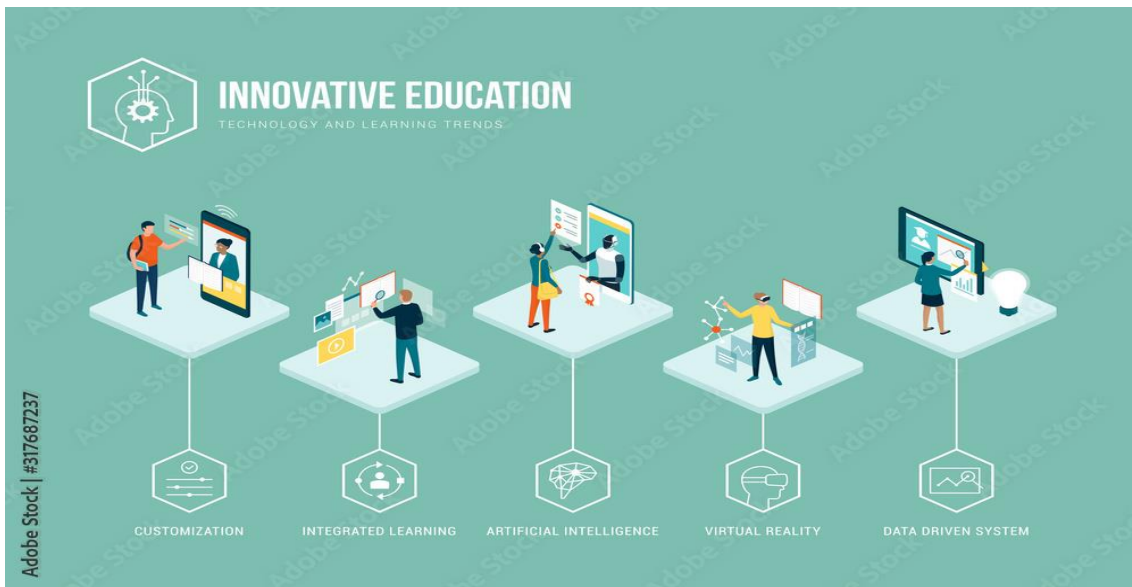
Things to ponder: Most adults are not aware of how much they can do online and do not recognize how being digital citizens could make their life easier.



Bridging the digital divide should be considered as a critical component of social progress. Countries should encourage their citizens also to become digitally active citizens as active aging is associated with various dimensions such as health, participation, security, etc. Hence, older citizens' sense of acquisition, happiness, and security should be enhanced in the information society. The digital divide between adults and the rest of the population is a global problem. Countries worldwide should exchange their effective practices to enable the social inclusion of their citizens in this population.

g) Consider how adults learn

Things to ponder: Many adults do not complete education programs as they are not designed according to the ways how adults learn effectively.



Anyone who designs learning opportunities should consider how adults learn. Adults want practical, problem-oriented learning opportunities that are closely linked to their context. What works for an individual may not work for another. Therefore, providing learners with an option to choose the one that works best for them is a good idea. Making learning enjoyable is considered to facilitate the learning process, so training materials can be made enjoyable and relevant.

h) Improve digital competences

Things to ponder: Adults are struggling in many parts of life due to their lack of digital competence. Some even do not have younger adults who can help them.



Digital competencies taught through trainings should be practiced and improved in real life. Merely teaching the skills to be used is not adequate. Helping learners to use them actively in daily life, as part of their current work if possible is a critical issue. Teaching adults current digital skills has a middle or long-term aim of helping them to compete in the new digitalized work life. Hence, they should be helped to apply the acquired knowledge.

Here, private and public institutions are also recommended to take initiatives to improve the competencies of their employees. When these kinds of trainings are adopted as a kind of learning policy, they can be benefitted more regularly. If applied effectively, it can enhance the dissemination of digital culture among people with low qualifications. In this regard, policymakers are recommended to create new policies for further education.

i) Increase motivation and benefit from crystallized intelligence

Things to ponder: Adult learning is not and cannot be a copy of school-time behavior.



Knowledge coming from prior learning and past experiences is referred as crystallized intelligence. If the right teaching methods are utilized, people who have already completed school education could eagerly and effectively learn by benefitting from crystallized intelligence. In their all learning activities, adults take advantage of their previous experiences, mental habits, knowledge organization, and thinking strategies. For this reason, their preferences and abilities should be taken into consideration while planning education programs.

Different from young learners, adults need to recognize the necessity of learning something before they decide to learn. Upskills or reskills requires a lot of motivation for adult learners. Making the learning topics relevant to adult learners is one way of enhancing this motivation. Motivated adults learn more effectively, and increasing their motivation is based on some factors as follows:

- ✚ let them know the purpose of education
- ✚ help them achieve better results through empirical education
- ✚ consider that learning is similar to problem-solving for adult learners, and plan accordingly
- ✚ always keep in mind that they learn best when the subject is of direct value to them
- ✚ help them learn successfully as adult learners want to learn successfully.
- ✚ make learning worthwhile as adult learners want to see what they learn is worth the time and money they spend

j) Promote self-learning skills together with digital skills

Things to ponder: Research shows that employees need extensive upskilling or reskilling the majority of jobs in the European Union require at least a basic level of digital skills.



The labor market has changed dramatically, which caused the job market, workers, business, and governments to evolve their needs. A culture of lifelong learning needs to be adopted for meeting these needs. Therefore, when adult learners are provided with any kind of digital skills training, they should be encouraged to learn self-learning and life-long learning. Massive teaching-learning programs are available through digital technologies. Learners should be taught that using these kinds of programs could help them to learn at their own pace in a non-formal or informal learning setting. Benefitting from self-learning opportunities in digital settings could help businesses and employees to help them to retrain their workforce while enabling workers to retain and safeguard their jobs and careers by improving their range of skills and competencies. This model of learning also eliminates physical barriers when they are done through distance education.

All trainings provided to adult learners should highlight the importance of life-long learning and self-learning through digital technologies. This indicates that the trainings do not have to be face-to-face, one can determine their own learning needs, find the learning opportunities available online, and benefit from self-learning as a method.

k) Promote the use of smart learning environments

Things to ponder: Learning environments have been evolving, and smart learning environments could be an answer to current needs.



Smart learning environments can be described as learning environments that are flexible, effective, efficient, engaging, adaptive, and reflective. They include the integration of both formal and informal learning. As it is an adaptive system that improves learning experiences based on learning traits, preferences and progress, and thus it includes high degrees of engagement, knowledge access, feedback and guidance, etc. The learning environment is continuously enhanced with the use of technologies, and its personalized adaptive learning characteristics are something that can promote self-learning.

Learning environments have been evolving, and the pandemic made it necessary to utilize distance options. In this new era, there is a need for reviewing and redefining the learning processes and utilizing the tools available to promote such needs. Trainings designed for adults should include smart learning environments

1) Help adult learners recognize the learning opportunities available

Things to ponder: Many adults are not aware of the learning opportunities provided to them in online or face-to-face learning settings.



Many countries provide their citizens with trainings and education to help them gain skills required in the 21st century. While all institutions, governments, and various sectors have begun to use digital tools and services, they face the necessity of including citizens of all ages in the digitalized world. The gap between generations has widened due to the rapid development of technology and made it necessary for countries to provide long-term and short-term learning opportunities for their citizens. Adult learners should determine what they need to learn to catch up and look for available training opportunities in their local environment. On the other hand, these training activities may not always be conducted face-to-face. Online learning has become part of the life of every one of us, learners can find many learning opportunities provided online. Hence, any courses provided to adult learners could help them recognize the learning opportunities available to them.

m) Help adult learners acknowledge that digital competence is necessary

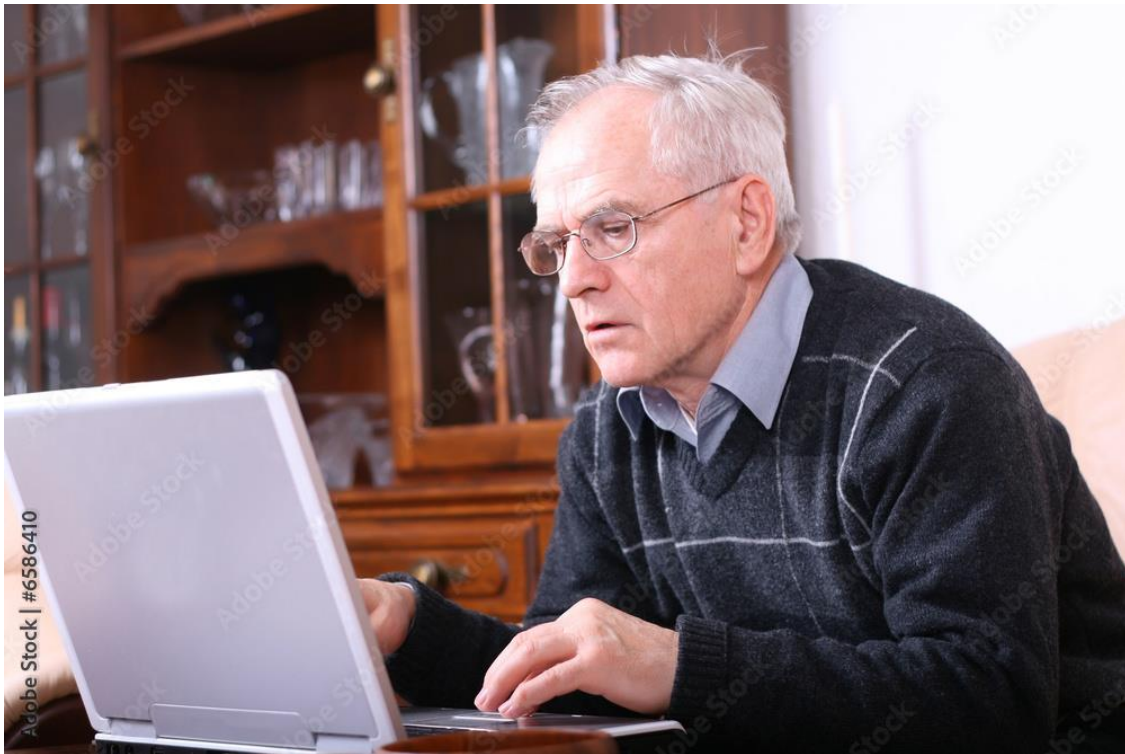
Things to ponder: Almost half of the population in many countries have insufficient level of digital competence, with a small majority who do not use the internet.



Digital competence is defined as the confident and critical use of Information Society Technology (IST) for work, leisure, and communication. Many people in different parts of the world do not utilize digital tools or the internet. However, a great majority of the things have become digitalized with an unbelievable speed, particularly with the pandemic. Ignoring the dominant role of technology and living without trying to be a part of it causes social and digital exclusion. Low-skilled adults need to realize this undeniable fact and act accordingly, which is highly important for their work and private life. Trainers and educators who communicate with this group of learners should aim to raise their awareness about the necessity of digital competence.

n) Remind that learning is lifelong and the content is changing

Things to ponder: Many adult learners do not have access to quality training and many others need upskilling and reskilling.



Before technology was developed this much, learning information at an early age was adequate to major in a field. However, today's adult learners need to realize that learning is still life-long, with content changing at an amazing speed. Only thinking of the development of computer technologies within the last two decades could provide an important picture of the issue. Upskilling and reskilling are two important needs for most adults in various work fields. However, it is important to note that these have become important for those who do not work but are citizens benefitting from very basic services. These services are provided through digital means now, which will continue in the following years. Adult learners should recognize this fact and know that the content has been changing in all fields.

o) Teach them how to benefit from distance learning opportunities

Things to ponder: Many adult learners do not know that distance learning can provide valuable learning content in line with their interests.



Miscellaneous learning and teaching activities have been carried out in various parts of the world. Although participating in these trainings face-to-face is a great opportunity for the individual, it is not feasible or affordable for many adults due to factors such as lack of time, work and family responsibilities, lack of budget to be allocated to this, etc. However, in today's world, learning is not limited to time and place. Individuals who are interested in any learning topic can find valuable content available online. Besides easily accessible videos and web pages, there are free or purchased and structured courses that aim to improve the knowledge and skills of people from all over the world. Adult learners should be aware of the distance learning opportunities and benefit from them, and trainers of any content should help them how to do it.

p) Engage in collaborative learning activities

Things to ponder: Adult learners who participate in small group activities report to benefit from them and enjoy the learning process.



Participating in small-group activities is reported to help adults learn best because such learning experiences provide them an opportunity to share, reflect, and generalize their learning experiences. Receiving constructive feedback during these activities regarding how they are doing is of great importance for adults. Adults who want to improve their knowledge and skills could look for training programs with these characteristics to maximize their learning. Knowles states that “If we know why we are learning and if the reason fits our needs as we perceive them, we will learn quickly and deeply”. Participatory and collaborative learning practices put the learner in the center and make learners active participants in their own learning. Therefore, adult learners should be provided with educational opportunities that make them active participants in their learning.

r) Make them actively use what they learn

Things to ponder: Adults find education activities effective if they can use them in real life and see that the time and budget they spend are worth it.



If learners are active participants in their learning, the training they receive becomes more effective. The learning process could be more fruitful if it happens in collaborative learning environments where adult learners learn by doing. Besides, learning happens effectively when the new information and skills are directly relevant and meaningful to learners' concerns, needs, and interests. However, what is learned should be used actively in daily life. Adult learners should be provided with opportunities to use the newly learned information and skills to make them permanent in their life. In this way, it can be possible to increase these skills with some other new ones to be learned in the future.

CONCLUSION

The world of work has been affected dramatically by factors such as technological developments, the rapid increase of online services, demographic changes, etc. These factors also affect the number and quality of jobs available as well as how they are carried out and what skills are needed. Not all countries experience these developments in the same speed, but skill needs are predicted to continue to change at an accelerated pace. Such conditions put low-skilled adults at risk of experiencing a deterioration in their labor market prospects. Lack of contemporary skills is a major risk factor because occupations requiring no specific skills and training are most likely to be automated, which calls for the need to provide low-skilled adults with the upskilling and reskilling they need. It is important to address specific training barriers and design programs in line with the characteristics of adult learners. Making the learning content accessible, relevant, manageable, and affordable is an issue that should be taken into consideration by policy makers and program designers. Adults learning collaboratively in smart learning environments are considered to benefit from the training content and utilize the knowledge they gain for their employability. Designing the learning environments and content in line with the specific characteristics of adult learners is of crucial importance. Low-skilled learners should initially be helped to acknowledge the requirements of the new world in this age and determine the skills they need to catch up. They should be helped to become aware of training opportunities in their local environments or online. Learning them and using them in their daily life activities are believed to make adult learners digital citizens, and equipping adults with the necessary digital skills are believed to enhance social inclusion.

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About the Partner Organisations



Sarıcam Public Education Center is a public institution founded in 2009 in Adana, Türkiye and affiliated to the Ministry of National Education, Directorate General for Lifelong Learning. Sarıcam HEM, which offers training services throughout the year, including weekends and evenings, carries out tasks in accordance with the principles and objectives of non-formal education. Sarıcam HEM provides non-formal educational activities in collaboration with a number of government and private institutions, as well as volunteer organisations. Its primary responsibilities include implementing training activities, as well as assisting and monitoring training activities.



Adana Alparslan Türkeş Science and Technology University (Adana ATSTU) is a relatively young higher education institution established in 2011 in Adana located in the south of Turkey and is the pivotal city incorporating industrial and agricultural activities in the region. The university consists of 8 faculties, the school of foreign languages, institute of social sciences, institute of natural & applied sciences, 1 continuing education center supporting lifelong learning and a Turkish Language Education Center that helps its international students gain an insight into Turkish language and culture during their study period. Adana ATSTU has around 3000 undergraduate and 1000 graduate students and 100 doctorate students.



Ecoistituto Del Friuli Venezia Giulia was established in 1989 and is located in Udine. It is a research non-profit organization specialized in sustainable development. Its main research scopes are:

- 1) Digital Social Innovation
- 2) Innovative teaching-learning methodologies
- 3) Special needs education
- 4) Social robotic



Foundation "Research and Innovation in Education Institute" [INBIE] is an NGO Institution situated in Czestochowa – Poland, founded in 2014. INBIE promotes equal educational opportunities to all social groups, and fights against social exclusion and supports adult people at risk of marginalization. INBIE cooperates closely with formal and non-formal educational Institutions,

local authorities, and Czestochowa Centre of Non-Governmental Organisations to develop adults' new skills to increase their chances of a successful return to work and search for better life chances. Staff from INBIE do research and work in entrepreneurship, management, use of ICT in Education and workplace aiming to improve adult people's professional and entrepreneurial competencies for creating new services and business to fight against unemployment and social exclusion.



Three Thirds Society The Non-Profit Organization (NPO) “THREE THIRDS SOCIETY” with the distinctive title “3/3 SOCIETY” has been established in 2010 by people with various professional backgrounds, but common goals, visions and principles regarding social cohesion and the support of vulnerable social groups. The organization undertakes

initiatives in economic, political and legislative level to address issues of social exclusion, promote gender equality and combating all forms of discrimination. NPO “THREE THIRDS SOCIETY” has extensive experience in Supporting Entrepreneurship and especially Social Entrepreneurship for achieving smart, sustainable and mainly inclusive growth, with emphasis on Innovation and Competitiveness, e.g., providing consultation, preparing Business Plans, Developing Cooperative and Clustering schemes and Entrepreneurial Incubators in fields such as Agrotourism, Cultural Heritage, Creative Industries, Home-Care for elderly, disabled people etc. “THREE THIRDS SOCIETY” has prepared, in collaboration with Panhellenic Union of Social Economy Partnerships (P.E.S.K.O.), a continuous training program called “Mentors for Social Economy”, which is being implemented, in cooperation with municipalities and other public bodies.



Rezekne Academy of Technologies (RTA) is a state-founded university-type higher education institution with unlimited international accreditation. The aim of RTA is to ensure academic and professional higher education in accordance with the level of scientific development and Latvian cultural traditions, competitive in the European educational

space, developing studies and research in 14 study fields. RTA implements several projects co-financed by EU programs, involving academic and general staff and students. With more than 185 cooperation partners from 31 countries, RTA promotes high mobility of academic staff and students (2nd-3rd place among all Latvian higher education institutions). The aim of the RTA Lifelong Learning Center is to promote lifelong learning, ensuring the continuation of previously acquired education and the development of education in accordance with the requirements of the labor market and the interests of clients. RTA CLL offers internships and continuing education programs to foreign partners.

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