

## LIFELONG LEARNING FOR CREATIVITY AND INNOVATION

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### Abstract

*Lifelong learning skills have always been important in any education and work setting. However, recently there is a new focus on these skills in engineering education. The expectation that engineering graduates must have “a recognition of the need for, and an ability to engage in lifelong learning”. The paper first defines a set of attributes / skills, which are necessary for students to develop as lifelong learners. It is postulated that the “recognition of the need” requires skills in the affective domain, while the “ability to engage” requires skills in the cognitive domain. Next, the paper offers course design elements, which help students develop lifelong learning skills.*

**Keywords:** lifelong learning skills, learners, engineering education.

### INTRODUCTION

Europe is living through a period of change — challenging and at the same time exciting. For the sustainable growth and employment is needed new momentum where the priorities are innovation, creativity and mobility. For that the focus is on education and training, by providing new learning opportunities.

Learning occurs throughout life. Education cannot be envisioned as a finite thing, a “preparation” for life, but must be viewed as a part of life itself. Recently the education was not universally approached as a lifelong process. Except to getting certification, most people did not have a conscious attitude about being lifelong learners. But now the term lifelong learning is part of everyday conversation in educational parlance. Presently, there are education departments with the title Lifelong Learning and university courses on lifelong learning.

Lifelong learning has emerged as one of the major challenges for the worldwide knowledge society of the future. A variety of events support this claim: (a) 1996 was the “European Year of Lifelong Learning”; (b) the United Nations Educational, Scientific and Cultural Organization (UNESCO) included “Lifetime

Education” as one of the key issues in its planning; and (c) the G7-G8 group of countries named “Lifelong Learning” as a main strategy in the fight against unemployment.

An operational environment of mass markets, simple products and processes, slow change, and certainty has been replaced by customer orientation, complex products and processes, rapid and substantial change, uncertainty, and conflicts. In today’s competitive global marketplace, lifelong learning demands lifelong learning. In the past, hard work and loyal service led to a secure future.

Today, employers provide a place on those who continually acquire skills and knowledge and who have the resilience and flexibility to adjust to the evolving needs of the global labor market. Thus, the ability to engage in lifelong self-directed learning is the single most important competence that people must possess.

### LIFELONG LEARNING: A DEFINITION

Lifelong learning may be broadly defined as learning that is pursued throughout life: learning that is flexible, diverse and available at different times and in different places.

Lifelong learning crosses sectors, promoting learning beyond traditional schooling and throughout adult life (post-compulsory education). This definition is based on Delors' (1996) four 'pillars' of education for the future.

**Learning to know** - mastering learning tools rather than acquisition of structured knowledge.

**Learning to do** – equipping people for the types of work needed now and in the future including innovation and adaptation of learning to future work environments.

**Learning to live together, and with others** – peacefully resolving conflict, discovering other people and their cultures, fostering community capability, individual competence and capacity, economic resilience, and social inclusion.

**Learning to be** – education contributing to a person's complete development: mind and body, intelligence, sensitivity, aesthetic appreciation and spirituality.

Lifelong learning can instill creativity, initiative and responsiveness in people thereby enabling them to show adaptability in post-industrial society through enhancing skills to: manage uncertainty, communicate across and within cultures, sub-cultures, families and communities, negotiate conflicts.

The European Commission found that lifelong learning has "Four broad and mutually supporting objectives: personal fulfilment, active citizenship, social inclusion and employability/adaptability". In this regard, lifelong learning has life wide dimensions that transcend narrow economic and vocational aspects.

The European Lifelong Learning Initiative defines lifelong learning as "**a continuously supportive process which stimulates individuals to acquire all the knowledge, values, skills and understanding they will require throughout their lifetimes...and to apply them with confidence, creativity, and enjoyment in all roles, circumstances, and environments.**"

This definition emphasizes lifelong learning as (a) *continuous* (it never stops); (b) *supportive* (it isn't done alone); (c) *stimulating and empowering* (it's self-directed and active, not

passive); (d) *incorporating knowledge, values, skills, and understanding* (it's more than what we know); (e) *spanning a lifetime* (it happens from our first breath to our last); (f) *applied* (it's not just for knowledge's sake); (g) *incorporating confidence, creativity, and enjoyment* (it's a positive, fulfilling experience); and (h) *inclusive of all roles, circumstances, and environments* (it applies not only to our chosen profession, but to our entire life).

"Learning" is understood to mean the constructive conversion of information and experience into knowledge, insights and skills.

### LIFELONG LEARNING CONTEXT

According to the National Education Act B.E. 2542 (1999) Lifelong education means education that integrates **formal, non-formal** and **informal education** in order to create opportunities for continuous lifelong development of quality of life.

**Formal education** specify the aims, methods, curricula, duration, assessment and evaluation conditional to its completion.

**Non-formal** education has flexibility in determining the aims, modalities, management procedures, duration, assessment and evaluation conditional to its completion. The contents and curricula for non-formal education shall be appropriate, respond to the requirements, and meet the needs of individual groups of learners.

**Informational education** shall enable learners to learn by themselves according to their interests, potentialities, readiness, and opportunities available from persons, society, environment, media or other sources of knowledge.

Educational institutions are authorized to provide any one or all of the tree types of education.

Lifelong learning is therefore about:

- Acquiring and updating all kinds of abilities, interests, knowledge and qualifications from the pre-school years to post retirement. It promotes the development of knowledge and competences that will enable each citizen to adapt to the knowledge-based society and actively participate in all spheres of social and economic life,

- taking more control of his or her future.
- Valuing all forms of learning, including: formal learning, such as a degree course followed at university; non-formal learning, such as vocational skills acquired at the workplace; and informal learning, such as inter-generational learning, for example where parents learn to use ICT through their children, or learning how to play an instrument together with friends.

Lifelong Learning (LLL) has the following objectives:

- To promote knowledge, skills and competence,
- To meet the needs of individuals / citizens, the needs of society,
- To increase employment opportunities.

Realistic and sustainable perspectives are based on existing educational structures, activities and experience and which define a structured framework for lifelong learning that is flexible and open to the necessary continuous process of further development. The structured framework has been devised to match not only the **life phases** of the individual from early childhood to old age but also essential aspects of lifelong learning, which constitute **development focuses**.

At the same time, the combination of life phases and development focuses seeks to counteract the separation of the individual educational sectors.

The development focuses are: a) inclusion of informal learning, b) self-directed learning, c) development of skills, d) networking, e) modularization, f) learning guidance, g) new learning culture/popularization of learning, h) fair access.

During "**childhood**" learning greatly influences access to education and thus the individual's chances of success in life. The target groups include not only the children themselves, but also their parents, teachers at day-care centers as well as teachers at primary school. Essential elements during this phase of life include the scope and quality of **informal learning**, the **development of skills** on the basis of new educational plans, the **networking** of kindergartens, schools, parents, child and youth service institutions, as well as **learning guidance** particularly for parents.

During "**adolescence**" most learning processes take place in school. Learning during this phase of life is characterized by educational programs organized by others and by the obligation to learn. The **development of skills** is particularly important and this means that schools impart basic skills such as learning and action skills, social and personal skills as well as the ability to work in a team in addition to subject knowledge. It is also very important to foster the ability of adolescents to organize their own learning and to make them practice independent learning (**self-directed learning**). During the next phase of life, which begins when "**young adults**" enter the world of work or start their initial vocational training and which ends when they take up regular employment, the following focuses are of major importance: the inclusion of informal learning, self-directed learning and the development of (social, professional, cultural and personal) skills. **Networking** takes place mainly between schools, companies, higher education institutions, associations, job centers and institutions of continuing education. **Learning guidance** with respect to questions of vocational training, academic studies and continuing education or training plays an important role. In this phase, the main features of the **new learning culture** are relevance to practical work and orientation towards transferability. It is important to help young adults understand that entry into the world of work does not put an end to learning but means transferring to another stage of learning.

"**Adult life**" is a phase which is increasingly determined by change, and for some by breaks and interruptions – a fact which clearly demonstrates the need for lifelong learning. Because of their strong involvement in professional life and family life time is very scarce for adults. Therefore, the possibility to structure their own learning (**self-directed learning**) is very important for them. Personal, social and occupational **skills** can be further developed in courses offered for continuing general, vocational and political education.

The term "**the elderly**" is defined as including mostly adults who will soon enter retirement or are already retired. Formal learning

becomes less important and learners have greater freedom to decide for themselves whether, how and for what purpose they should take part in learning activities (**self-directed learning**).

Achieving or retaining independence and autonomy even at an advanced age is one major goal of lifelong learning during this phase of life. With regard to the **development of competencies**, it is obvious that preserving skills and abilities is more important than developing new ones. The older people also acquire new skills in order to pass on their experience and knowledge or to do voluntary work.

The concept of lifelong learning is based on three fundamental attributes:

- it is lifelong and therefore concerns everything from cradle to grave
- it is life-wide recognizing that learning occurs in many different settings
- it focuses on learning rather than limit itself to education.

When it comes to the implementation of lifelong learning for all it is important to look closer at the implication of these attributes.

### **LIFELONG LEARNING AND TRADITIONAL LEARNING**

Lifelong learning is more than adult education, which often is restricted to providing people with opportunities to engage in (school-like) learning activities during their adult life. Lifelong learning involves and engages learners of all ages in acquiring and applying knowledge and skills in the context of authentic, self-directed problems. By integrating working and learning, people learn within the context of their work on real-world problems.

The learner's involvement in goals setting is a prerequisite to motivated and self-regulated learning. Goal setting implies the personal commitment of the learner and is an integral part of learning in life. The learning is rewarding because the learner is in the process of realizing his or her goals. In traditional learning, motivation is often lacking because students are not involved in goals setting. Learning goals are often unclear to students and seem to have no clear relation to life goals. Students are often not compelled to feel that

these are their goals, but rather those of the teacher, the school, or society. The goals are fixed and predetermined, providing students with little or no chance of involvement.

Traditional learning tends to motivate by extrinsic rewards, such as praise from the teacher or others, grades, or financial compensation. As a result, students can develop a dependency on praise, leading to feelings of insecurity and nondevelopment of task motivation. Learning flows from a variety of activities, for example, observing how other people do something, discussing with others, asking someone, looking up information, trying something for oneself and learning from trial and error, and reflecting on all the previous activities.

Learning in real life usually combines activities from different categories and is always interwoven with the socio material world. In contrast, traditional school learning tends to focus mainly on one type of activity, processing symbolic information.

Evaluation of learning in life is directed toward achieving life goals. Evaluation is not an end product, but leads to renewed orientation, other learning activities, or a change in goals. The learner decides if and why the gained knowledge and skills were satisfactory. At school, the teachers and administrators decide on the criteria and also decide whether the students have satisfied the criteria or not. Traditionally, criteria are often related to the learning goals, but not to life goals. In real life, learners decide on the type of activities in which to engage, often with input from others, but the final responsibility is with the learner. In traditional learning, most of the regulating is done by the teacher and educational system. This makes learning look like a neat, step-by-step procedure, from the beginning of the book to the end, from the start of the program to the examination. Learning processes in real life are much less predictable and straightforward.

### **TRAITS AND SKILLS OF LIFELONG LEARNER**

*"Wisdom is not a product of schooling, but the lifelong attempt to acquire it". - Einstein*

The concept of lifelong learning is to create a

society of individuals who are motivated to continue learning throughout their lives—both formally and informally.

The lifelong learner is defined as a person who takes responsibility for their own learning and who is prepared to invest “time, money and effort” in education or training on a continuous basis. Lifelong learners possess a particular set of personal attributes.

The individuals most likely to participate in learning, either formally or informally throughout their lives, (have) acquired:

- the necessary *skills* and attitudes for learning, especially literacy and numeracy skills;
- the *confidence* to learn, including a sense of engagement with the education and training system; and
- willingness and *motivation* to learn.

People can be involved in lifelong learning in different ways. Lifelong learning encompasses both formal and informal types of education and training. A person who attends a parenting skills course run by a community provider is as much a lifelong learner as a full-time post-graduate student undertaking university-based research. Lifelong learning also includes work-based training that does not necessarily lead to formal qualifications. The key factor in defining a lifelong learner is not the type of education or training in which they are involved, but the personal characteristics that lead to such involvement. Lifelong learners must have the *motivation* and *capacity* to learn, in any type of setting, with any type of teacher, or simply by themselves.

There is no single factor motivating a lifelong learner. Motivations include to upgrade job skills, to start a business, to learn about a subject or to extend their knowledge, to meet new people, to develop self-confidence, to get involved in the community or to develop personal skills.

Lifelong learning is attitudinal—that one can and should be open to new ideas, decisions, skills, or behaviors. Skills for lifelong learning relate to the need to acquire, process, and transfer knowledge. Lifelong learners need to be able to determine what they need to learn and how to make and carry out a learning plan. They need to know how to locate appropriate

information, evaluate its quality, organize it, and use it effectively. They need to be critical and creative thinkers, problem solvers, and decision makers, and they need to practice regular self-reflection.

Steps to lifelong learning can be articulated as (a) reflection, (b) setting goals, (c) assessing knowledge and skills, (d) creating a learning plan, (e) putting the plan into action, and (f) evaluating and refocusing.

Lifelong learning's core values of learning, exploring, and serving, realize benefits for the mind, body and spirit and make it an incredibly powerful tool for personal transformation and enhancement.

Why to study during the entire life? The answer is the list of the top 10 benefits of lifelong learning:

*Lifelong learning helps fully develop natural abilities.*

*Lifelong learning opens the mind.*

*Lifelong learning creates a curious, hungry mind.*

*Lifelong learning increases our wisdom.*

*Lifelong learning makes the world a better place.*

*Lifelong learning helps us to adapt to change.*

*Lifelong learning helps us to find meaning in our lives.*

*Lifelong learning keeps us involved as active contributors to society.*

*Lifelong learning helps us to make new friends and establish valuable relationships.*

*Lifelong learning leads to an enriching life of self-fulfilment.*

## CONCLUSION

Lifelong learning is now recognized by educators, governing bodies, accreditation organizations, certification boards, employers, third-party payers, and the general public as one of the most important competencies that people must possess. Promoting lifelong learning as continuous, collaborative, self-directed, active, broad in domain, everlasting, positive and fulfilling, and applicable to one's profession as well as all aspects of one's life has emerged as a major global educational challenge. Meeting this challenge will require changes in the way teachers teach and learners learn, as teachers take on a more facilitative role and learners take more responsibility for

setting goals, identifying resources for learning, and reflecting on and evaluating their learning.

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