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Complexity is the new normality

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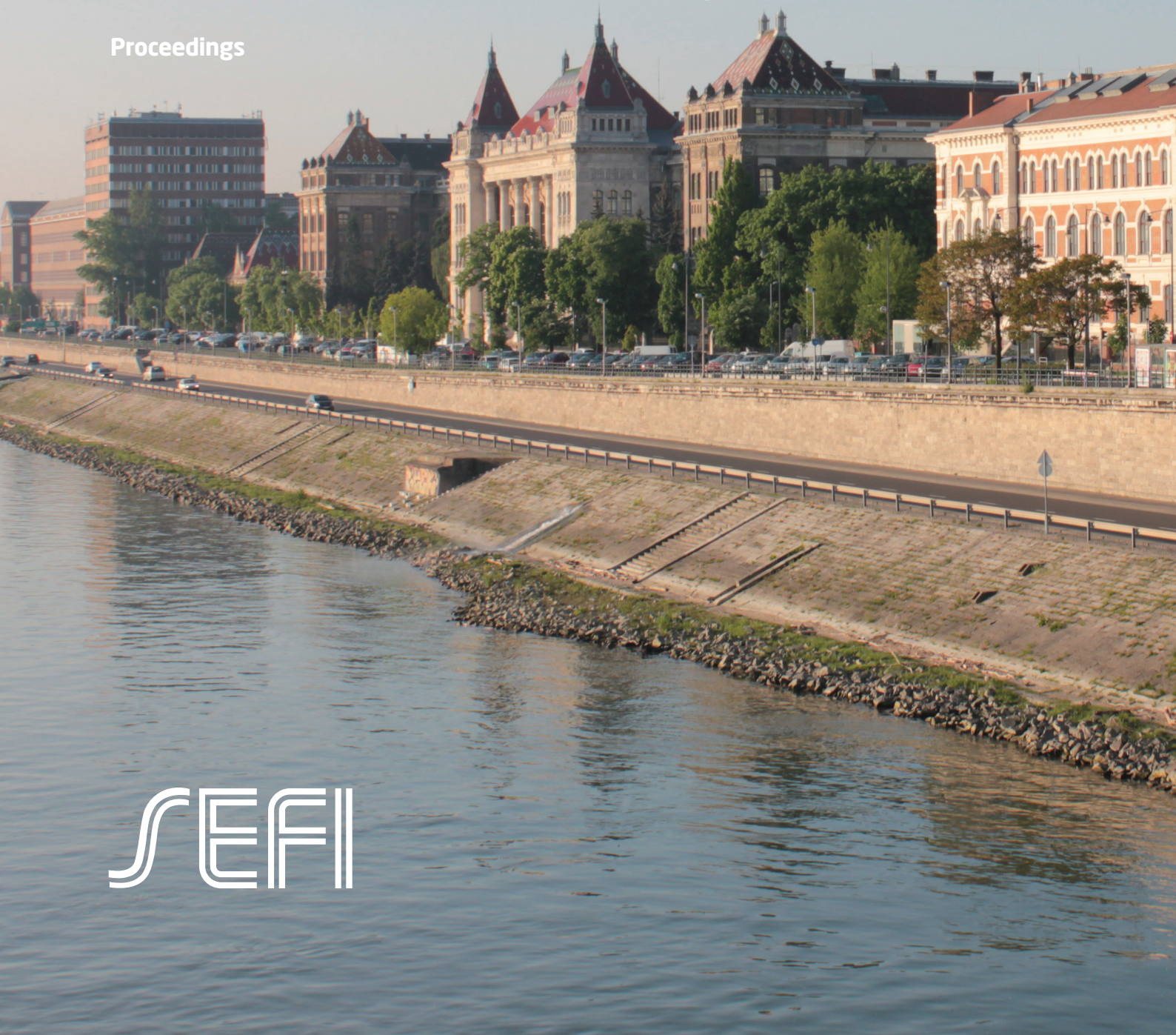

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Linda Citterio

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Lifelong learning is a (self) complex: monitor; reflect; directed learning situation

Tun Zaw Oo*
*Doctoral School of Education, University of Szeged

Dr. Anikó Kálmán**
** Budapest University of Technology and Economics

(Department of Technical Education),

ABSTRACT

Nowadays, the world is changing rapidly. According to Schwab (2017)1 from the World Economic Forum, the convergence of digital, physical, and biological technologies has immense potential to be a source of world economic growth. Furthermore, many professionals said that new knowledge is rapidly being developed and disseminated, demanding that students/engineers acquire a wider range of skills and knowledge in these areas (Sopdek, Bernard & Oliva, 2007) 2. In learning that new knowledge, Kalman (2016) 3 said that learning should take place as close to application as possible. And in her lifelong concept, education must comprise all learning, not only formal but also informal and non-formal learning. These concepts are very important for the engineers and the methods of teaching. The formal learning is not enough for them, they also need to learn for life and not for the school report, and need new competencies, innovation and creativity in learning. Thus, there is a must not only for the students but also for the teachers to self-manage, self-monitor, and self-reflect on what they did to know whether they are effective or not. This paper aims to clear the dust from the ideas of lifelong learning for helping the engineers to acquire new technologies and new competencies for their lives. Therefore, the first section provides an account of the lifelong concept and its importance for facing new challenges in 21st century. In the second section are provided two key elements of lifelong learning such as self-directed learning and reflective practices for engineers.

Key words: lifelong learning, self-directed learning, reflective practices

1. INTRODUCTION

"The 21st century can be rightly regarded as a century of transformation, economic and cultural globalization and rapid technological development. In this context, it is vital to form a society which can adapt to the changes occurring in the environment, by always acquiring and updating knowledge and skills, necessary for everyday life and beyond" Due to the globalization and the growth of the fast-changing knowledge economy, people require upgrading their skills throughout their adult lives to cope with modern age, both in their work and in their private activities.

According to the above statements, we are not able to lead our lives without continuing to learn or updating our knowledge to adapt with the changing world. In the lifelong learning for adults, educational media and technology have evolved to the extent that there must be a paradigm shift in the way education and the working and learning processes are presented, conducted, and extended, changing these 'educational' norms in the context of lifelong learning. Thus, while we can't control much of the world changing around us, we can control how we respond. Our world is changing in such a frantic pace that if we do not continue to grow and develop; we will soon be left behind.

To update knowledge, people become aware on the importance of ongoing learning. Whilst the concept has been known since 1960s, most people are hardly involved in actual practices. They merely know about the lifelong learning is for the whole life of individuals (from the cradle to the grave). The essence of lifelong learning is meanwhile deeper and more beneficial for everyone. Lifelong learning's core values: exploring, and serving, coupled with benefits for the mind, body and spirit make it an incredibly powerful tool for personal transformation and enhancement. Actually, lifelong learning is a (self) complex: monitor; reflect; directed learning situation. If we know this concept well enough that may be useful for acquiring new competencies and skills.

In this paper we explain the lifelong learning concept is, how to self-monitor, self-reflect, and self-direct oneself; and how the teacher can help the students develop these interrelated situations.

2. HOW IS LIFELONG LEARNING (SELF) COMPLEX?

2.1 The Lifelong learning concept

There are various kinds of definitions for lifelong learning. According to UNESCO, *"lifelong learning is about acquiring and updating all kinds of abilities, interests, knowledge and qualifications from the pre-school years to post retirement which promotes the development of knowledge and competences that will enable adaptation to the knowledge-based society and also valuing all forms of learning*.

As the next concept, lifelong learning refers to "*the activities people perform throughout their lives to improve their knowledge, skills and competence in a particular field, given some personal, societal or employment related motives"*

The European Lifelong Learning Initiative also defines lifelong learning as *a continuously supportive process which stimulates and empowers 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.*

These basic concepts encourage people to update their knowledge to be able to adapt with the changing world.

Furthermore, Lifelong learning is viewed from the lifewide perspective. In the contemporary perspectives of lifelong learning as a lifewide dimension; it refers to the fact that learning takes place in a variety of different environments and situations, and is not only confined to the formal educational system. Actually, lifewide learning covers formal, non-formal and informal learning. Life-wide learning involves a breadth of experiences, guides, and locations and includes core issues such as adversity, comfort, and support in our lives. Then, as the another perspective of lifewide learning is the experience in management of ourselves and others, of time and space, and of unexpected circumstances, turns of events, and crises. This learning brings skill and attitudinal frames for adaptation for how to adapt, to transport knowledge and skills gained in one situation to another, and to transform direct experience into strategies and tactics for future use.

However, in Kalman's book, "Learning – in the new lifelong and lifewide perspectives" she states that the term 'lifelong' does not refer to only one dimension of lifelong, but it signifies these two (lifelong and lifewide) dimensional learning process itself, which is as 'long' and as 'wide' as life itself since it is an inseparable part or constituent of life, which the phrase 'lifelong' wishes to capture. According to her, the terms 'lifelong' and 'lifewide' are actually involved in the process of lifelong learning process. The most importance is how to increase the lifelong long learning more for all individuals. The most important thing is how to increase lifelong learning for everybody.

In my opinion, however, the term *'lifelong'* education does not refer to the longitudinal or temporal dimension of continuous learning or education, but it signifies *the concrete two-dimensional learning process itself*, which is as long and as wide as life itself since it is an inseperable part or constituent of life, which the phrase 'lifelong' wishes to capture. 'Lifelong' has been two-dimensional from the beginning; simultaneously meaning the vertical integration of the consecutive levels of education, the requirement that higher and higher levels be built upon each other, and horizontal integration, that is, the harmonisation of learning activities with one another and other activities such as cultural activities, work, family life and public-civic activities. The so-called integrated curricula or cooperative educational programmes have been designed with this perspective.

If we merely want to refer to one dimension of lifelong learning, the vertical dimension, we use the terms lifecourse, lifetime, lifespan or life prospect. If we refer to the other, horizontal dimension or integration, we can use the term 'lifewide'

For lifelong and lifewide learning to function well, there is an urgent need to view afresh at the current trends of the technological landscape and learning paradigms impacting on education in order to formulate the most appropriate strategies for an integrated approach. Thus, the core to help the learning paradigms change is to know how the lifelong learning is a (self) complex; monitor, reflective, directed learning situation, and how it can be improved to all. Like the Edwards et al.'s (2002) 4 belief, "self-directed learning (self-managing & self-monitoring), and reflective practices (self-reflecting) are the key tools for the lifelong learning process", how the self-monitoring, the self-reflective and the self-directing are important for individual's lifelong learning is described in the following.

2.2 Self-monitoring learning situation, a part of lifelong learning process

As described in several studies, the self-monitoring can be categorized into two groups: namely behavioral and academic self-monitoring.

Individuals, who monitor themselves behaviorally are much more likely to monitor themselves academically as well. When it comes to academic self-monitoring, it is also necessary in order to use the metacognitive strategies in academic learning. Likewise, self-monitoring is also a vital skill for the individual who can use learning strategies, regulate their own learning; that is to say, the individual has learned to learn.

About behavioral self-monitoring, self-monitoring is an evidence-based strategy that involves systematically observing one's own behavior and recording detecting whether or not the target behavior occurs. Furthermore, self-monitoring is claimed to be a main component of self-management, providing an opportunity for collaborative diagnosis and treatment evaluation, and forming the starting point for self-insight and initiation of change in patterns of experience and behavior. In few studies, the self- monitoring was highlighted as a two-stage process involving (a) discriminating the occurrence/non-occurrence of a target behavior, and (b) self-recording some aspect of the target behavior.

About the cognitive self-monitoring, it may be part of the cognitive process by which indeterminate zones of practice are identified in that it leads trainees to realize the problem initially, and then to actively respond by engaging in reflection-in-action. Moreover, self-monitoring refers to students' efforts to observe themselves as they evaluate information about specific personal processes or actions that affect their learning and achievement. By depending upon this information, students can assess their progress and make necessary changes to ensure goal attainment. They exclaimed that self-monitoring can serve as a tool for self-improvement by enabling students to direct their attention, to set and adjust their goals, and to guide their course of learning more effectively.

Therefore, today's youths should know how to self-monitor themselves for their lifelong learning. In 2012, McDougall, Morrison and Awana (5) pointed out some procedures for self-monitoring. They said that self-monitoring refers to behavioral self-control and it was mentioned as the self-assessment followed by self-recording. In the behavioral self-control process, three steps for all individuals for their continuous learning are presented. These steps are (a) self-determination of reinforcement and self-administration of reinforcement (procedures in which individuals decide how and when to reward themselves contingent upon successful performance of predetermined tasks); (b) self-evaluation (whereby individuals judge the quality of their performance or products); or (c) self-graphing (whereby individuals chart their behaviors on graphs which display an on-going record of the frequency, duration, rate, or accuracy of those behaviors). These three steps are useful for the learners in the self-monitoring process.

Moreover, the teachers should also know how to help their students self-monitor their progress which can lead to their lifelong learning process. Lane et al. (2011; p. 148) 6 outlined the following steps for implementing self-monitoring of life-long learning process:

1. Establish prerequisite conditions
2. Identify and operationally define the behaviors

3. Design the self-monitoring procedures, including a monitoring form
4. Teach the student the self-monitoring procedures
5. Monitor student progress
6. Consider maintenance and follow-up

To think further the statements of the above authors, we can find three groups such as definitions of self-monitoring, procedures for self-monitoring, and teacher's roles to help students implement their self-monitoring process. First, to conclude the above definitions of self-monitoring, there are two groups of self-monitoring; behavioral and academic. And self-monitoring can be interpreted as the self-insight and initiation of change in both behavioral and academic self-monitoring. It is because we can find some words similar in meanings such as *self-insight in patterns of experience and behavior; discriminating the occurrence or nonoccurrence of a target behavior; self-recording some aspect of the target behavior; identify to realize the problem; observe themselves to direct their attention*. Second, in the part of self-monitoring procedures, the students can do self-monitoring very well by following these procedures, especially, first self-assessment, and second, followed by self-record. Third, the teachers can also help their students by using the above six steps for implementing their self-monitoring. Actually, this monitoring stage is the most basic part for all individuals.

2.3 Self-reflective learning situation, a part of lifelong learning process

Self-reflective learning is another situation of individuals' lifelong learning process. Reflective *practice is the ability to reflect on one's actions so as to engage in a process of continuous learning*. Therefore, self-reflective practice is important for the lifelong (continuous) learning. Actually, this idea of reflective practice is originally used by Dewey and its meaning is *assessing the grounds (justification) of one's beliefs*, *the process of rationally examining the assumptions by which we have been justifying our convictions*. To become lifelong learner, the individual needs to rationally justify his/her own beliefs about the actions. In some explanations of reflective practice, they highlighted that a person which reflects throughout his or her practice is not just looking back on past actions and events, but is taking a conscious look at emotions, experiences, actions, and responses, and using that information to add to his or her existing knowledge base and reach a higher level of understanding. According to their explanation, the learner needs to make conscious look (not mere looking) at the past events; only then can the learning improve more and more. If we have a look to John Dewey's definition of reflective practice, it is *the active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and the further conclusions to which it tends*. Thus for the learners, they need to learn with careful consideration for their continuous development.

Reflective *practice is probably the most valuable tool in one person's box of resources and enables him to think both backwards and forwards*. Thus, reflective practices are of great importance for the lifelong learning process. In lifelong learning, the learner has to reflect on his past and present events (in studies) and move towards his/her further progressive development. Without this kind of reflection, he/she will not become a successful learner. Then, if we have a look at the definitions of reflective practice, their main point is that *reflection is a process of viewing an experience of practice in order to describe, analyze, evaluate and to inform learning about practice*. Thus reflective practice can be useful and even called lifelong

learning process – to describe and analyze the current studies and to progressively change to another step of studies.

Reflective practices can help in both present and past events effective learning. There are two kinds of reflective practices such as *reflection-on action* and *reflection-in action*. Reflection-on-action is perhaps the most common form of reflection. It involves carefully re-running the events in mind that have occurred in the past. The aim is to value the strengths and to develop different, more effective ways of acting in the future. Reflection-in-action is the hallmark of the experienced professional. It means examining the own behavior and that of others while in a situation.

There are many available reflective practices for their students, some of which can be used for our lifelong learning development. They are; personal journals, dialogue journals, highlighted journals, key phrase journals, double-entry journals, critical incident journals, three-part journals, free association brainstorming, quotes, quotes in songs, reflective essays, directed writings, experiential research paper, directed readings, ethical case studies, class discussion, students' portfolios, it's my bag, express yourself, small group week, email discussion groups and class presentations. These reflective practices can be done not only by the students themselves, but also can be encouraged by their teachers. Apart from these practices, based on Dewey, Oluwatoyin (2015) 7 described some questions for reflective practices that can be used in thinking process of lifelong learning.

- What was I aiming for when I did that?
- What exactly did I do?
- How would I describe it precisely?
- Why did I choose that particular action?
- What theories/models/research informed my practice?
- What was I trying to achieve?
- What were the reasons for doing that?
- How successful was it?
- What criteria am I using to judge success?
- What alternatives were there?
- Could I have dealt with the situation any better?
- How would I do it differently next time?

In one concept about lifelong learning, it is actually that *lifelong learning focuses on the accumulation of skills and qualifications as a means of coping with changes and uncertainty in professional practice – they believe that lifelong learning is an important tool for developing a habit for reflective practice*. Thus, for these two options (reflective practice and lifelong learning), one is necessary for the other. And we can even say that lifelong learning is the self-reflective process for individuals. Furthermore, Pollard, et al., (2014) 8 said that the teachers can ask the following questions to encourage the students to make self-reflection:

1. How might you find this out?
2. What skills did you use?
3. How did your group function?
4. What worked and what didn't?
5. What connections did you make?
6. How was your thinking pushed?
7. Why did you choose the approach you did?

8. What did you enjoy and why?
9. How could you have done it differently?

To conclude the above authors' findings, three main parts can be found like *definitions of reflective practices, the time events in which reflective practices can be done,* and *reflective tools*.

In the part of definitions, we can notice that the reflective practices (described in different ways; *to reflect*, *rationally examining*, conscious look, *careful consideration*, *think both backwards and forwards*, *viewing an experience of practice*, *recapture their experience*) lead to the lifelong learning (described in different ways; *continuous learning, justifying our convictions,* adding information to his or her existing knowledge base, *the further conclusions to which it tends,* move to his further progressive development, learning about practice, working with experience). Thus, we can conclude that lifelong learning is the (self) reflective process. For all individuals' lifelong learning development, these above mentioned reflective practices are of great importance. Only when they can reflect on their own behaviors can they lead to their successful lifelong learning.

As the third conclusion on reflective tools, we can find many kinds of reflective practices for supporting individuals' lifelong learning practices. Finally, some reflective questions are presented to both students and teachers to encourage the students' reflective practices in their lifelong learning, which is important point in the process.

2.4 Self-directed learning (SDL) situation, a part of lifelong learning process

Lifelong learning is also a self-directed learning situation. Learners' self-directed learning has been defined and described in various ways such as autonomous learning, independent learning, student-initiated learning, student-centered learning and all these terms *carry the meaning of becoming less and less reliant on the teacher or tutor; while the students take on more responsibility for their own learning*. Thus, to become lifelong learner, the students can achieve self-directed learning by monitoring and reflecting themselves whether they had prior higher-order understanding or not.

Then, from the point of lifelong learning, the acquisition of self-directed learning skill (SDL) equips students to be lifelong learners and referred to *a process in which individuals take the initiative in diagnosing their learning needs, formulating learning goals, identifying human and material resources, choosing the appropriate learning strategies, and evaluating learning outcomes*. To diagnose, formulate and identify the learning needs, the reflective practices are therefore of great importance for the students.

For self-directed learning, the individual has to decide about the learning goals and strategies, make decisions on how to use the resources and how to evaluate the success, sustain his/her motivation and make appropriate evaluations on learning process. In self-directed-learning, the control is gradually transferred from the teacher to the learner and learners in the learning goals and how to carry out a task have greater independence. Self-directed learning emphasizes the role of motivation and determination of learners at the beginning and continuation of efforts to achieve the goals. In their studies, they described that self-directed learning is controlling and directing the process consciously and constantly to understand any situation-concept, solve problems, having or strengthening any skill.

Actually, the self-directed learning is a teaching method that can be defined based on the learner's responsibility. Then, to dawn upon the lack of teacher's direct participation on student's self-directed learning, self-directed learning can include various types of individual and group activity of students that they have undertaken in the classroom and extracurricular activities at home without the direct participation of the teacher. In student's self-directed learning, there is no need of teacher' participation; however, the student cannot lead his lifelong process without reflective practice.

Richards and Lockhart (2005) 9 described some reflective questions for the students' self-directed learning. These questions can be self-reflected by the students. They are as follows.

- What am I learning?
- Why am I learning it?
- How am I learning it?
- How am I using what I am learning?
- What are my strengths and weaknesses in learning?
- What must be my learning priorities?
- How can I improve and build upon my learning process?
- How well can I work towards my short-, medium- and long-term goals.

Although teachers cannot directly participate in student's self-directed learning, in the schools, they can teach students by emphasizing self-directed learning skills, processes, and systems rather than content coverage and tests. For the individuals, self-directed learning involves initiating personal challenge and developing the personal qualities to pursue them successfully.

Kalman (2016) highlighted the teachers' roles for helping the students to become self-directed learners. In these roles, the teacher should:

1. Serve as a resource for the individuals or small groups, with certain parts of the learning content,
2. Help learners assess their needs and competences so that everyone can plan their individual study schedule,
3. Provide feedback about each learner's subsequent draft plans or ideas,
4. Specify the resources available and provide new information in the topics specified in the survey of needs,
5. Compile a collection of resources about the information, media and models related to the specific fields or topics of study,
6. Organize how to establish contact with people who function as resources in specific topics,
7. Work with the learners as mock audience or in order to provide stimulus outside regular classes and group activities,
8. Help students develop an approach to learning which promotes independence,
9. Encourage debates, asking questions and small group activities in order to arouse interest in the learning experience,
10. Help learners develop a positive approach to learning and self-directed interest,
11. Control the learning process including such activities as the continuous recognition of needs, the obtainment of continuous feedback and promoting learner participation, and

12. Provide confirmation or assessment of student performance both during the process of obtaining the learning experience and at the end of it.

To conclude the above statements on self-directed learning, we can often find terms which are similar in meaning; *individuals take the initiative in diagnosing their learning needs, individual has to decide the learning goals and strategies, the control is gradually transferred from the teacher to the learner, based on the learner's responsibility, and activities without the direct participation of the teacher*. These terms dawn upon the students' self-directed learning. Thus, we can conclude that lifelong learning is also self-directed learning process. The reflective practices can increase the individuals' self-directed learning process. These reflective processes are interrelated with individuals' self-directed learning. By following the above suggestions of students and teachers' roles for self-directed learning, not only the teachers can encourage their students for their continuous learning process, but become the students empowered to develop their lifelong learning themselves.

CONCLUSION

Actually, lifelong learning is self-directed learning. To make self-direction, the learners need to do self-monitoring first, based on self-assessment, and self-reflecting on present and past actions to find out which are their strengths and weaknesses. After completing these basic learning situations systematically: self-monitoring and self-reflection, can they self-direct own successful lifelong learning.

This paper intends to be a concept paper of lifelong learning which is a (self) complex; monitor, reflective, directed learning situation. In the literature cited, the three parts are systematically described such as how to do self-monitoring, self-reflecting, and self-directing; and how the teacher can help their students to improve these three scenarios. If these steps are carefully followed, today's learners can lead their successful lifelong learning process and may become productive citizens for future.

According to the European Lifelong Learning Initiative (which defined lifelong learning as a continuously supportive process which stimulates and empowers individuals to acquire all the knowledge, values, and skills), we can acquire knowledge, values, and skills if we understand the learning process in its entirety and complexity and apply it lifelong.

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