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E-Learning Self-Assessment Model (e-LSA)

Abstract: Quality of learning is not just the students' major concern, but their parents, prospective employer, government, and society, in addition to the academic administrators and teachers. E-learning is a good opportunity for companies to up-skill their employees to meet the demands of lifelong learning. However to guarantee a successful and a high quality learning results and to improve learning outcomes, e-learning process should be continuously evaluated. Guaranteeing the quality of e-learning process arises the need for an effective measurement model that takes into consideration all e-learning process stakeholders' perspectives. A measurement is needed to evaluate and improve e-learning quality in organizations.

Based on Total Quality Management (TQM) and The European Foundation for Quality Management (EFQM) excellence model, we have developed e-learning self-assessment model (e-LSA) to evaluate the quality of e-learning in an organization. E-LSA can be used by management team and by trainers for self-assessment by learners. Moreover, we developed a e-LSA-Guide model to help the organizers of evaluation process to select the relevant criteria and statements to be included in their self-assessment tool.

Introduction Quality of learning

Quality is a condition for the success of products in general and quality becomes essential in the field of education in particular. Qualitative training makes professionals capable to function as competent professionals having good knowledge. Qualitative learning makes young people capable to become functioning as competent professionals having good knowledge and living as good human beings in social life. Learning will contribute to sustainable social and changing economic development [9][10]. Quality of education requires three basic conditions: Ensure real growth in personality and behaviour of the learner, alignment with the needs of society and professional environment, and the availability of qualitative resources and professional management skills of the learning institution. How to provide these conditions of quality in education and training, and how to control the quality is a management issue of each organisation responsible for the organisation of learning and also of e-learning. A high quality of educational process becomes a key success factor. Continuous evaluation of the enabling organisation of courses, learning processes and using a learning quality system is a necessity to improve the quality of education [1]. In higher educational institutes the quality of learning is not only the students' major concern, but their parents, prospective employer, government, and society, in addition to the academic administrators and teachers [3].

1. Total quality management (TQM) and EFQM excellence model

1.1. Total Quality Management (TQM)

TQM is the concept of continuous evaluation and improvement of processes, products, people, etc. which should be the responsibility of every member in the organization [17]. TQM has been a major force that has influenced

Business operations and organizational management since the 1970s [16]. The main characteristic of TQM is the coverage of all enterprise wide activities and all requirements of all stakeholders. TQM emphasize customer focus, continuous improvement, employee empowerment, and data driven decision-making [14].

Regardless of sector, size, structure or maturity, to be successful, organisations need to establish an appropriate management framework. The European Foundation for Quality Management (EFQM) Excellence Model is a practical tool to guide organisations to TQM by measuring where they are on the path to Excellence, helping them understand the gaps and then stimulating solutions.

1.2. Characteristics of excellence [14]

The Model, which recognizes there are many approaches to achieving sustainable excellence in all aspects of performance, is based on the premise that:

Excellent results with respect to Performance, Customers, People and Society are achieved through Leadership driving Policy and Strategy, which is delivered through People, Partnerships and Resources, and Processes.

The fundamental concepts or characteristics of excellence are: results orientation, customer focus, leadership and constancy of purpose, management by processes and facts, people development and involvement, continuous learning, innovation and improvement, partnership development, and public responsibility.

The characteristics of excellence have links to different evaluation areas and also to each other. Partnership development, for example, requires identification of partnerships, prioritization and setting objectives for partnerships such that they generate added value for customers.

In addition, customer focus in vocational education and training requires identification of the needs of customers, such as students and the world of work, development of products and services based on these, and monitoring and analysis of customer results achieved. Results should be used as a basis to improve operations and set new objectives.

1.3. The EFQM excellence model [2][6]

The EFQM model is based on those fundamental concepts or characteristics of excellence.

The EFQM Excellence Model was introduced at the beginning of 1992 as the framework for assessing organisations for the European Quality Award. It is now the most widely used in organisational framework in Europe and it has become the basis for the majority of national and regional Quality Awards. This model is a non-prescriptive framework which recognizes that there are many approaches to achieving sustainable excellence. It can be used as a self-evaluation tool for organisations, large and small, public and private sector.

The EFQM Excellence Model is a framework based on 9 criteria. Five of these are 'Enablers' and four are 'Results'. The 'Enablers' criteria cover what an organisation does. The 'Results' criteria cover what an organisation achieves. 'Results' are caused by 'Enablers' and 'Enablers' are improved using feedback from 'Results'.
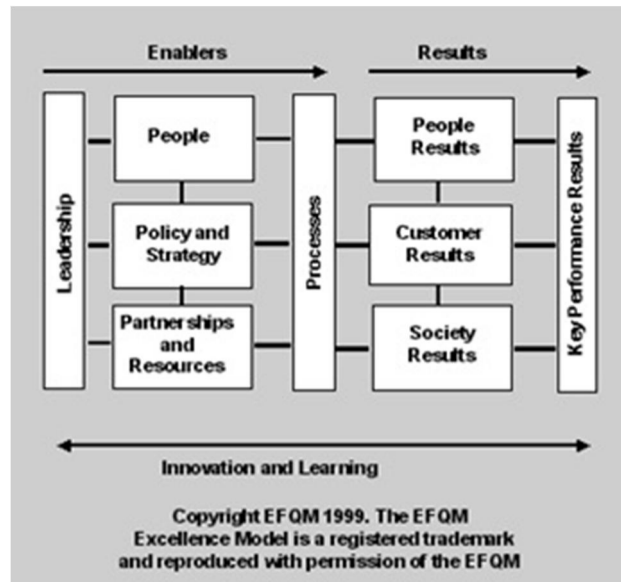
Figure. 1: EFQM Excellence model

The EFQM Model is illustrated in Figure 1. The arrows emphasize the dynamic nature of the Model. They show innovation and learning helping to improve enablers that in turn lead to improved results.

1.4. Criteria and sub-criteria used in EFQM excellence model [2]

The Model's 9 boxes represent the criteria against which to assess an organization's progress towards Excellence. Each of the nine criteria has a definition, which explains the high level meaning of that criteria. To develop the high level meaning further each criteria is supported by a number of sub-criteria parts. Sub-criteria parts pose a number of questions that should be considered in the course of an assessment.

1. Leadership

Leadership is even as important as products and processes are. Management can motivate and stimulate in the way to continuous improvement.

2. Policy and strategy

The EFQM is concerned not just with product and service quality but is concerning itself with organizational policy and strategy. Policy deployment to ensure that the strategy is formulated and is known to management is important.

3. People

EFQM covers aspects of training and service quality, but is goes further requiring effective human resource development, teamwork, empowerment, rewards and career planning.

4. Partnership and resources

Suppliers are becoming partners with emphasis on mutual beneficial relationships. Development and use of knowledge is point for attention. On point of resources facilities need to be maintained for capability.

5. Processes

The focus of EFQM is on the key processes necessary to deliver the organization's strategy. Quality processes are important too.

6. Customer appreciation

The major box requires evaluation of customer satisfaction through surveys and interviews

7. Functioning of people in the organization

People are supposed to be surveyed with ideas such as team briefings and suggestion schemes to know their appreciation of the organization

8. Position in the society

EFQM asks the company to establish its impact on wider society, for example involvement in community activities.

9. Company results

EFQM requires measuring the results of the company in a BSC way

1.5. EFQM model and self-assessment

The EFQM model can be used as a benchmarking tool and can be the base for achieving a quality certificate. [21]

But the EFQM model is a tool that organizations may use as a framework for **self-assessment** that enables an organization to identify its strengths and areas for improvement and the extent to which its operations and results are in line with the characteristics of an excellent organization. EFQM believes that the process of self assessment is a catalyst for driving business improvement. The EFQM definition for self assessment is: "Self-assessment is a comprehensive, systematic and regular review by an organization of its activities and results referenced against the EFQM Excellence Model. The self-assessment process allows the organization to discern clearly its strengths and areas in which improvements can be made and culminates in planned improvement actions that are then monitored for progress."There are more types of self assessment methods. The questionnaire approach is one of the least resources intensive technique and can be completed fast. It is an excellent method for gathering information about the perceptions of people within an organization. Some organizations are using simple yes/no questions, others are using slightly more sophisticated versions that use a rating scale.

We have chosen for the combination relevance/ evaluation of statements formulated for all quality criteria that have been identified linked with the 9 main criteria of the model. [21]

It means that for each statement the respondent will have to answer on 3 questions: Is this criteria relevant? What is the quality of these criteria? And is an improvement needed yes or no?

The measurement reports will show the weighted value for all sub-criteria and will show which aspects needs improvement.

2 Quality assurance in education and self-assessment by the learners

2.1 Quality assurance in education

Quality assurance (QA) is a part of the Bologna Process agenda in higher education. Higher education institutions are expected to reflect on many issues, particularly on the teaching and learning processes, and on the roles and responsibilities of management, teachers and students in the enhancement of the quality of those processes. Implementation of the Bologna guidelines focuses on the introduction of procedures for quality assurance.

2.2 Quality assurance in ICT enhanced learning, e-learning and blended learning

The implementation of the Bologna guidelines focuses on the implementation of ICT enhanced learning in higher educational institutes. Al-Fadhi and Khalfan [20] underline that ICT enhanced learning environments require that students actively engage in the learning tasks and activities and even are taking responsibility for their own learning. Organisations are becoming convinced that e-learning or blended learning programs will

create added value by decreasing the costs of company-wide training programs and by increasing the flexibility of the organisation of learning programs. The ICT enhanced learning program has to be in line with the organisational perception about the requirements and specifications of this format of learning in view of achieving the objectives of the organisation. Organisation of e-learning requires the appropriate infrastructure and policies to achieve the required quality for the program. E-learning needs considerable human, financial and technological resources.

2.3 Measuring quality in e-learning: self-assessment by the learners

Often quality of e-learning had been measured using principles and indicators that focus on the technological aspect of the e learning, which is a limited view of quality.

Fang Zhao suggests a framework that provides methods to improve the quality of e learning [12] including course effectiveness, adequacy of access in terms of technological infrastructure, student satisfaction, the interaction with the teacher, educational satisfaction of teaching staff and support services.

In a quality assurance model, the learner can play the role of evaluator about the organisation and the process of learning. Teachers and tutors are responsible for the learning content and the learning process. Moreover, the management of the learning centre or institute are responsible for the organisation of the process, for all resources, including the people and for the learning infrastructure.

A quality assurance system for the organisation of e-learning will include a self-assessment by the learner about all quality criteria covering all aspects of the enabling processes and resources. The EFQM model can be used to define the quality criteria. [22]

2.4 Kirkpatrick evaluation model

Kirkpatrick, as illustrated in Figure 3, is a four-level model of quality assessment, that can be applied to traditional way of learning and also to e-learning [15].

Results

Transfer

Learning
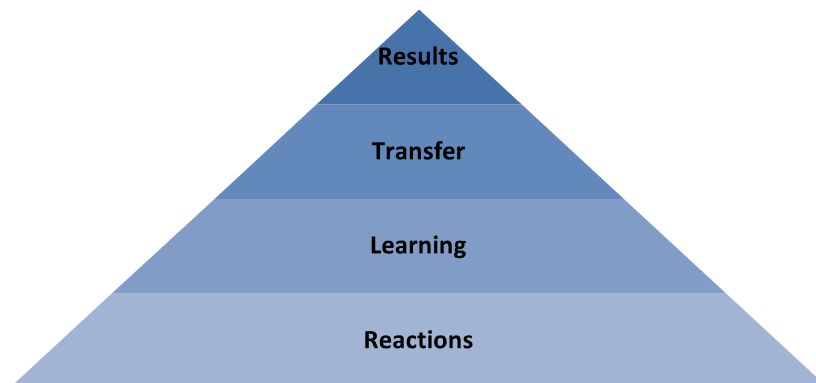
Reactions

Figure 2: Kirkpatrick evaluation model [19]

1. Students' reaction: students are asked to evaluate the training after completing the program. First is asked how well they like the training. But other questions are about the relevance of and the fitting to the objectives, the quality of the included interactive exercises, and the ease of navigation.

2. Learning results: has the learner increased his knowledge of the topic? What about the achievement?

3. Impact of learning on the functioning in the workplace: Are any of the new knowledge and skills retained and transferred back on the job? Is the student's behavior changed as a result of new learning?

4. Impact of learning on the business results: the evaluation of the business impact of the training must be measured. [7]

3. EFQM quality model for e-learning services

3.1 Key terms within a learning/teaching context

The EFQM criteria have to be translated to be applicable in a context of education. Focus will be on the activities directly linked with the organisation and management of learning/teaching and more specific on e-learning. We translated the general EFQM model (Figure 3.) to be applicable for e-learning services. The following translation of the key terms is set forward. The "people" in the model comprise both the learners and the teachers. Both are responsible for the learning process and for the overall attainment. The "customers or clients" are the learners, the parents, the future professional environment and some representatives of the community. Learners have a dual role as clients of the educational system and as people while contributing to the life of the educational institute and to the learning process. The government of the country and the management of the educational institute and other elected members of organising and controlling organisations cannot be seen as customers /clients, because they have (overall) responsibility for the quality of education offered by the educational institute, devolving operational control to the management of the educational institute and the administration. Educational Institutes enter into partnerships and are receiving additional services such as supply of materials. Also networking with other educational institutes, even internationally, has become increasingly popular in recent years

Basing the quality measurement or criteria model on EFQM, guarantees controlling all relevant activities and fitting all stakeholders' requirements. Most of the criteria we identified are on the enabling side of the model [8][15].
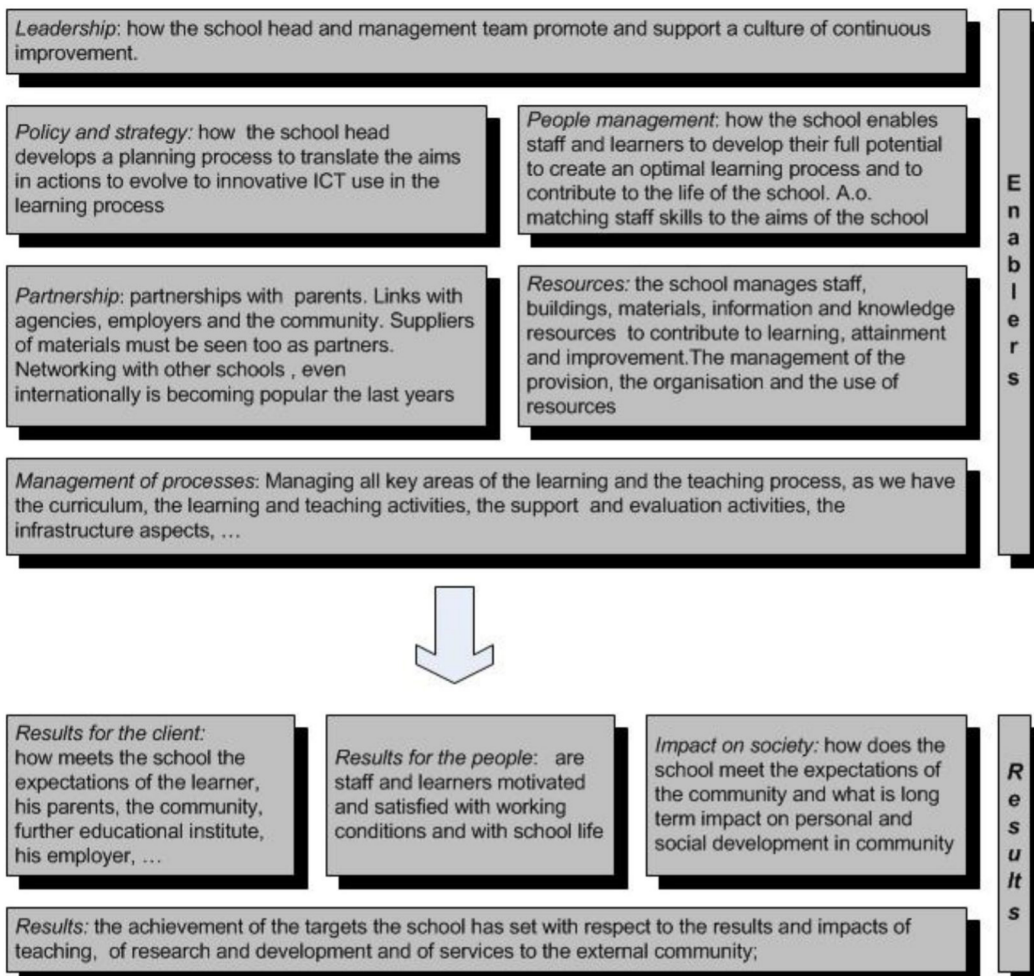

Leadership: how the school head and management team promote and support a culture of continuous improvement.

Policy and strategy: how the school head develops a planning process to translate the aims in actions to evolve to innovative ICT use in the learning process

People management: how the school enables staff and learners to develop their full potential to create an optimal learning process and to contribute to the life of the school. A.o. matching staff skills to the aims of the school

Partnership: partnerships with parents. Links with agencies, employers and the community. Suppliers of materials must be seen too as partners. Networking with other schools , even internationally is becoming popular the last years

Resources: the school manages staff, buildings, materials, information and knowledge resources to contribute to learning, attainment and improvement.The management of the provision, the organisation and the use of resources

Management of processes: Managing all key areas of the learning and the teaching process, as we have the curriculum, the learning and teaching activities, the support and evaluation activities, the infrastructure aspects, …

Enablers

Results for the client: how meets the school the expectations of the learner, his parents, the community, further educational institute, his employer, …

Results for the people: are staff and learners motivated and satisfied with working conditions and with school life

Impact on society: how does the school meet the expectations of the community and what is long term impact on personal and social development in community

Results: the achievement of the targets the school has set with respect to the results and impacts of teaching, of research and development and of services to the external community;

Results

Figure 3. General learning EFQM Model

3.2 The learning self-assessment Framework [20]

The following learning self-assessment framework is a fusion of the two models EFQM and Kirkpatrick.

The learning department is responsible for the organization of the e-learning activities. All stakeholders request some services from the learning department. To become excellent, the learning department has to balance and satisfy the needs of all relevant stakeholders.

In the center of the framework we put the 4 levels of Kirkpatrick. We split them in the first two levels being the learner centric levels and the two others being the environment centric levels.

The EFQM main criteria are linked with them.

The stakeholders are put around the frame. Their requirements are linked with the EFQM criterion parts.

The EFQM total quality model (TQM) for e-learning has been transformed to our Kirkpatrick-EFQM self-assessment framework. The self-assessment must be focused on the requirements as set forward by all stakeholders.
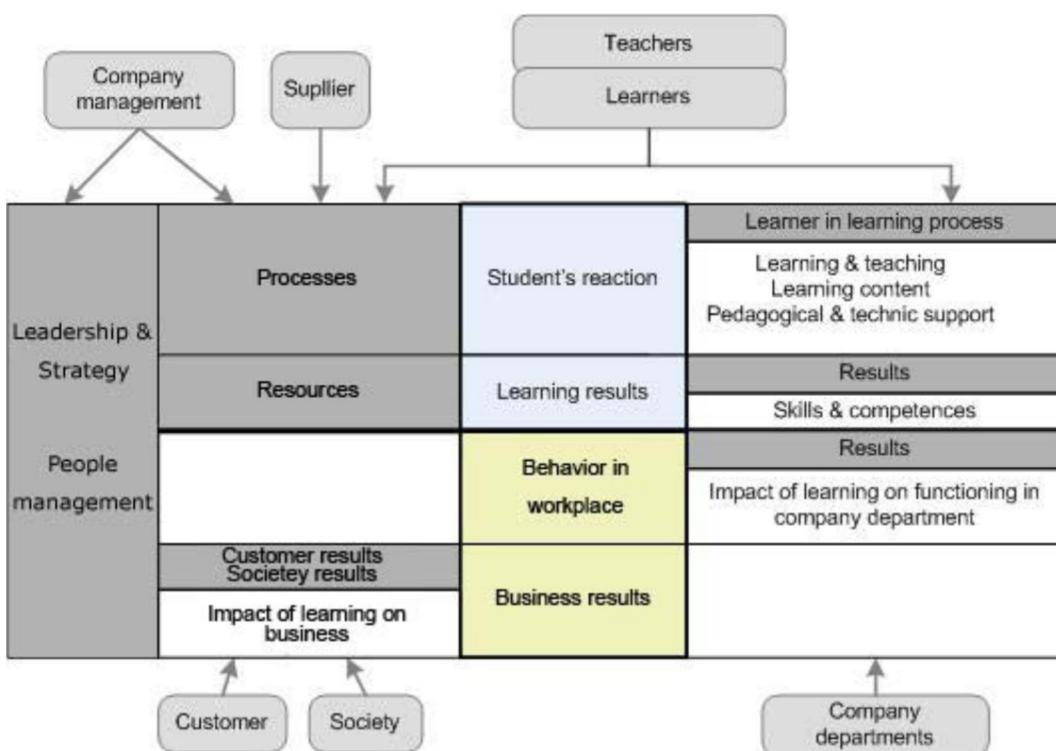

Figure 4. Learning self-assessment framework

Company management and the learning department have to take responsibility for quality assessment on these criteria. Several stakeholders can participate in the evaluation activity. The learner can partly take up the role of evaluator. The assessment of the quality of e-learning will be done by the internal stakeholders of the e-learning activity of the company: Company management and the learning department	leadership, policy and strategy
learning department and learner	the resources especially the learning system
learner	the resources and the processes and all aspects

	of the learning process
learning department	the process of development of e-learning solution
company management and other company departments	impact of learning
Company management	the evaluation of the fulfilment of the requirements of the external stakeholders.

3.3 Evaluation of E-learning by the Learner and the Limited Learner Centric Self-assessment Framework [20]

In most cases evaluation will be limited to the learner's evaluation task and so the TQM model will be limited to a subset of criteria, namely those that can be measured and evaluated by the learner.

In that case, the evaluation itself is limited to a subset of the EFQM criteria domains, being the learning process, the enabling resources, the student's reactions and the learning results.

Figure 5. Limited learning self-assessment framework

To identify the set of quality criteria we must take into account all the requirements of the stakeholders. But we will limit our framework. The learner can fulfil the role of evaluator of all aspects of the first two levels of Kirkpatrick, combined partly with the processes and resources domains of EFQM.

However the impact of learning can best be evaluated by company management and the company departments to which the learners are belonging. On company level evaluation could be made of the other EFQM domains.

If the learning department is developing its own e-learning course, than the development process has to be evaluated by the learning department itself. Other learning resources are included in the quality of the learning process and will be evaluated by the learner.

3.4   e-Learning self-assessment models (e-LSA)

3.4.1 Introduction

Based on Total Quality Management (TQM) and The European Foundation for Quality Management (EFQM) excellence model, we have developed e-learning self-assessment model (e-LSA) to evaluate the quality of e-learning in an organization. In addition, based on Benvic EU project [18], three criteria have been selected to be included in e-LSA model which are: Learning Development, Teaching Capability, and Evaluation. Moreover, we added two main criteria to the model which are: Management and Human Resources as presented in the following section.

3.4.2. Enabling criteria

We structured the enabling main criteria and sub-criteria in management related and in enabling resources and processes as the following: (MC: Main Criteria)

MC1: Management, process, and the development of the learning services

Criteria 1.1: Planning and development of learning courses

1. Acquisition of learning systems and relations with suppliers

2. Developing of courses and learning materials

Criteria 1.2: Quality process of learning systems and courses

3. Evaluation

4. Actions of improvement

Criteria 1.3: Finance and resources

5. Investment in learning systems and course development/acquisition

6. Investment in continuous improvement of learning solutions

MC2: Management of people

Criteria 2.1: Teaching capability and readiness

7. Skills development

8. Technical support

9. Organization support

10. Teaching evaluation

11. Staff incentives

12. Time management

13. Readiness capability level

14. Readiness capability development, support, and evaluation

15. Learning capability development

MC3: Enabling learning resources

Criteria 3.1: Information on available learning materials

16. Availability of learning opportunities

17. Course prospectus

18. Information on the learning provider

Criteria 3.2: Learning systems and tools

19. ICT and the learning system

20. System functions to facilitate learning activities

21. The physical learning environment for online sessions

22. Accessibility

23. Maintenance of facilities

24. E-library

25. Mobile learning platform

Criteria 3.3: User infrastructure

26. Connection and ICT facilities in classroom

27. Connection and ICT facilities at home

28. Mobile phone support

Criteria 3.4: Learning materials

29. Availability

30. Learning Content

Criteria 3.5: Teachers, tutors and learners

31.   e-learning readiness

32.   Learners ICT skills

33.   Learners e-learning skills

34.   Learners time management

35.   The level of motivation for further e-learning

MC4: Enabling learning processes

Criteria 4.1: Organisation of the learning service

36.   Guidance in the choice and selection of your course

37.   Registration process

38.   Welcome

39.   Organisation services and administration

Criteria 4.2: E-learning activities

40.   Course progression

41.   Teaching approach/Course design

42.   Personalising the learner's e-learning course

43.   Personalising your own learning

44.   Integration of face to face learning with e-learning

45.   Integration of group learning with self study

46.   Use of learning content

47.   Mobile learning

Criteria 4.3: ICT enhanced learning activities

48.   Using Tablet-PC in classroom teaching

Criteria 4.3: Learner support

49.   ICT Support

50.   Online support

51.   Group learning support

Criteria 4.4: Assessment of learners

52.   Assessment process/concept

53.   Assessment organisation

54.   Other areas of assessment

3.4.3 *Results criteria*

The results main criteria and criteria can be based on the adapted Kirkpatrick evaluation model of learning.

MC5: Learning results

55.   Increasing of learners' knowledge

56.   Alignment of learned knowledge with workplace requirements

57.   Application of learned knowledge

58.   Completion of the course

Under each of the stated sub-criteria a set of statements/questions have been developed and the evaluators are asked to answer them to assess and evaluate the process of e-learning in the organization.

4. E-LSA-Guide

In order to help and guide the organizers of the self-assessment, a two-dimension evaluation model e-LSA-Guide is proposed as illustrated in Figure 6.

Main Criteria and Criteria	Types/characteristics of e-learning activity					Evaluation aspects linked with the learning process				
	Individual . e-Learning	+ Face to face (Blended Learning)	+ Collaborative learning	+ Online support	+ Online evaluation	Organization of Learning	Teaching	Support of learning activities	Learning assessment and outcomes	Designing & development
MC1: Management, process, and the development of the learning services										
Criteria1.1: Planning and development of learning courses	X	X				X				X
Criteria1.2: Quality process of learning systems and courses	X	X			X	X			X	X
Criteria1.3: Finance and resources	X	X				X				X
MC2: Human resources & learners										
Criteria 2.1: Teaching capability and readiness	X	X	X				X			
MC3: Enabling learning resources										
Criteria 3.1: Information on available learning materials	X	X				X		X		X
Criteria 3.2: Learning systems and tools										
Criteria 3.3: User infrastructure	X	X	X	X	X	X		X		X
Criteria 3.4: Learning materials										
Criteria 3.5: Teachers, tutors and learners	X		X			X		X		X
	X	X				X		X		X
MC4: Enabling learning processes	X	X				X	X	X		X
Criteria 4.1: Organisation of the learning service										
Criteria 4.2: E-learning activities										

Main Criteria and Criteria	Types/characteristics of e-learning activity					Evaluation aspects linked with the learning process				
	Individual . e-Learning	+ Face to face (Blended Learning)	+ Collaborative learning	+ Online support	+ Online evaluation	Organization of Learning	Teaching	Support of learning activities	Learning assessment and outcomes	Designing & development
Criteria 4.3: ICT enhanced learning activities	X	X				X				X
Criteria 4.3: Learner support	X		X					X		
Criteria 4.4: Assessment of learners	X		X					X		
MC5: Learning results	X			X				X	X	
	X	X			X			X		X
	X	X	X	X	X			X		X

Figure 6: e-LSA-Guide

On the left side of the proposed e-LSA-Guide model, the main criteria and criteria are listed. While on the upper-right side, the types of learning activities and the evaluation aspects are listed. Based on the type of learning activities and the evaluation aspects, the relevant criteria are selected in order to guide the organizers of the survey to develop and implement the self assessment survey.

Conclusion

Qualitative learning makes young people capable to become functioning as competent professionals having good knowledge and living as good human beings in social life. Quality of learning is not just the learners' major concern, but employer, government, and society as well, in addition to the learning administrators and tutors. Qualitative ICT enhanced learning environment should be addressing a learner centred learning process. The e-learning program has to be in line with the organisational perception about the requirements and specifications of this format of learning in view of achieving the objectives of the organisation. The e-learning organisation should create the appropriate infrastructure and policies to achieve the required quality for the program. E-learning needs considerable human, financial and technological resources. This arises the need for an effective measurement model that takes into consideration all quality aspects to evaluate and improve e-learning quality in an organization. Total Quality Management (TQM) has been a major force that has influenced business operations and organizational management since the 1970s. The main

characteristic of TQM is the coverage of all enterprise wide activities and all requirements of all stakeholders. Kirkpatrick is another quality assessment model that consists of four levels and can be applied to traditional way of learning and also to e-learning. In addition, the European Foundation for Quality Management (EFQM) Excellence Model is a practical tool to guide organisations to TQM by measuring where they are on the path to Excellence, helping them understand the gaps and then stimulating solutions. EFQM believes that the process of self assessment is a catalyst for driving business improvement. There are more types of self assessment methods and the questionnaire approach is one of the least resources intensive techniques and can be completed fast. It is an excellent method for gathering information about the perceptions of people within an organization. In a quality assurance model, the learner can play the role of evaluator about the organisation and the process of learning. In addition, teachers and tutors are responsible for the learning content and the learning process. Moreover, the management of the learning centre or institute are responsible for the organisation of the process, for all resources, including the people and for the learning infrastructure. A quality assurance system for the organisation of e-learning includes self-assessment by the learner about all quality criteria covering all aspects of the enabling processes and resources. Based on TQM, Kirkpatrick and the EFQM excellence model, we have developed an e-Learning Self Assessment model (e-LSA) to evaluate the quality of e-learning in an organization. E-LSA consists of 4 main enabling criteria: Management, process, and the development of the learning services, Management of people, Learning resources, and Learning processes, in addition to the resulting criteria. For each of the main criteria a set of relevant sub-criteria have been developed, and under each of the sub-criteria, a set of relevant statements have been developed, in which the respondent have to answer on 3 questions: Is this statement relevant? What is the quality of this stated issue in the statement? And is an improvement needed yes or not? E-LSA can be used by management team, teachers, or learners as evaluators. Moreover, we developed e-LSA-Guide model to help the organizers of the evaluation process to select the relevant main criteria and criteria in order to obtain an effective and customized self assessment instrument. The selection of the criteria and sub-criteria will be driven by the type of the e-learning and by the goal of the evaluation process; focusing on the learning activities or on the organizational aspects.

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