Perceived importance of quality indicators in online lifelong learning programs: views of Greek adult learners

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Abstract

This study examines the responses of a comprehensive survey research on the perceived importance of 16 quality indicators for Online Distance Education (ODL), probing the perceptions of Greek adult learners, who participated in lifelong learning programs. Data analysis provides valuable insights for educators and policymakers in the field of ODL training by examining the perceived importance of human resources, institution, educational design, and evaluation. Results from the online questionnaire responses (N=203) highlight the importance of collaborative tasks, trainers' skills, interactive educational content, connection between theory and practice, and student feedback and affirm that learner satisfaction is a significant determinant of quality training, thus suggesting that institutions must prioritize quality assurance to provide trainees with a more rewarding and fulfilling online learning experience.

Keywords: Quality dimensions, distance education, online distance learning, adult education, training, quality measurement

Introduction

Education plays a critical role in the evolution of an individual, acting not merely as a catalyst for personal advancement but also as a measure of one's societal status. The concept of lifelong learning has adapted to cater to the diversity of information and the requirements of the new millennium, by utilizing pedagogical approaches. This promotes a society that is oriented towards knowledge and service, as argued by Nottingham (2019) and supports personal development with the objective of enhancing societal contribution.

In this context, a growing number of public and private institutions are utilizing Online Distance Education (ODL) as a preferred mode of training, as it offers a flexible and personalized approach to learning. ODL has emerged as an indispensable tool, particularly during the COVID-19 pandemic (Kostas et al., 2023), when it became the sole mean of learning and training, even though lifelong learning programs were offered fully online by various higher education institutions, during the last 10 years (Gouvias et al., 2019).

Following the COVID-19 pandemic, adult education has predominantly adopted distance learning methods due to their flexibility and ability to overcome obstacles faced by adult learners. As a result, most of adult training now takes place through new technologies (Kefalaki et al., 2021). Higher Educational Institutions (HEIs) have increasingly embraced the new technologies, if not else for reasons of cost-effectiveness and for overcoming geographic and bureaucratic barriers (Kyrma & Mavroidis, 2015). On the other hand, citizens are beginning to perceive such programs as the only way to acquire a competitive edge in a highly volatile labour market.

The primary objective of ODL is to deliver educational services to remote learners, with an emphasis on constant development and acquisition of knowledge and skills (Saxena, Baber & Kumar, 2021). The transition from traditional F2F lifelong learning to online one, has been significantly amplified since the onset of the pandemic, particularly noticeable within the realm of adult education and training. It is undeniable that distance learning has mitigated many of the challenges encountered by adult

learners, leading to its establishment primarily due to escalating demand. In this digital era, ODL is emerging as a vital cornerstone of education.

Consequently, it is important to comprehend how learners can reap benefits from online learning and to examine the elements that shape their perceptions of the overall quality of distance education (Gegenfurtner et al., 2020). Numerous scholars, according to Bhowmik & Bhattacharya (2021), have endeavoured to delineate quality in the realm of distance education, even though these attempts often focus on certain aspects at a given time, while neglecting others. The consideration of quality characteristics can vary greatly, leading to different approaches in evaluating ODL, from quality assurance norms, external audit and accreditation, surveys among stakeholders to processing of data analytics and performance indicators using AI.

Quality in distance education still presents a challenge (Vlachopoulos, 2016; Gaftandzhieva et al., 2023), necessitating the identification of key factors that are indispensable for its existence (Saxena, et. al., 2021). This fact highlights the complexity and multidimensionality of quality assurance in ODL, suggesting that a comprehensive approach that considers various factors is necessary to ensure the delivery of high-quality e-learning (Bhowmik & Bhattacharya, 2021). Indeed, various models (Cheng et al., 2001), quality measurement indicators (Abdullah, 2022), and best practices (Lewis, 2021) have been suggested, which are seen as imperative elements for a program to be deemed as high quality.

As the quest for defining and ensuring quality in ODL continues to be a critical area of research and development, this study explores the dimensions of quality in online distance training programs. It examines perceptions of adult learners on the necessary quality indicators, specifically in the context of online training provided through universities' Lifelong Learning Centres (LLCs) in Greece, aiming to contribute to the ongoing discourse on educational quality, particularly in the realm of ODL, with a focus on educational experience and efficacy between educators and trainees.

Quality and evaluation in ODL

Quality, as a concept, has been a subject of debate, with academics frequently grappling to provide a definitive explanation. It is a multifaceted concept, encompassing a diverse range of elements that are influenced by various factors, with a subjective nature, as it is contingent on individual perceptions and expectations (La Rotta et al., 2020).

Quality directly impacts "customer" satisfaction, and it is crucial for the product or service provided to be exemplary and unparalleled (Sánchez et al., 2021). Total quality management (TQM) is rooted in the foundational tenets of leadership theories, playing a crucial role in the creation of deep and influential leadership. Such leadership is typified by attributes such as empathy, humility, ethical behaviour, balanced data analysis, the fostering of development and effectiveness, introspection, motivation, and a concentration on the objective (Scott et al., 2020).

Quality has gained prominence across all sectors, including education, as institutions more and more emphasize the significance of delivering high-quality services through continuous adaptation to social and economic changes, social awareness, and inclusivity (Love & Horn, 2021). The persistent escalation in the quantity of students opting for distance education and training, coupled with the evolution of innovative technologies, has instigated a heightened level of competition amongst universities and training providers. This competition has been particularly evident during the pandemic, prompting an exploration of novel practices and methodologies designed to better accommodate the educational needs of learners.

Furthermore, in recent years, there has been a global emphasis on the cultivation of a knowledge-based society. This societal shift is a direct consequence of the increasing prevalence of internationalization and mobility. These elements, in conjunction with the social and geographical

diversity of participants, have acted as a catalyst in the enhancement of the quality of education provided (Sánchez et al., 2021).

Quality assurance is imperative in all forms of education, encompassing both formal and non-formal settings and can be achieved through the implementation of innovative practices. It is crucial to acknowledge that quality is not a static concept that can be predetermined, but rather, it must be flexible and adaptable to the prevailing circumstances (Stracke, 2019). Ensuring quality via evaluation is a crucial aspect for the enhancement and efficiency of ODL as an alternative method of education, which employs effective learning strategies that have proven to yield positive outcomes for participants (Sánchez et al., 2021), especially after the sudden transition to Emergency Remote Teaching (ERT) due to COVID-19 pandemic (Bozkurt et al., 2020).

It is important to recognize that the mere existence of evaluation does not assure the delivery of high-quality education. Evaluation functions as a vital instrument in discerning the presence or absence of quality in education. So, it is essential to circumvent any confusion between these two notions: the primary aim of evaluation is not to undermine educational institutions, but rather to pinpoint areas that necessitate improvement to augment the overall quality of education. Consequently, all educational providers should employ the evaluation results in a constructive manner and endeavour to enhance the facets that require adaptation (Baharun et al., 2021).

Evaluation can occur at a multitude of levels and aspects, as highlighted by Narayan (2020). This process may combine both formative and summative methodologies, with the goal of achieving an in-depth understanding of the learning outcomes and the expression of quality (Bin Mubayrik, 2020). Additionally, the process of evaluation can be executed either internally, that is, by the educational institution itself, or externally, that is, by an external body such as the government or local authorities (Bordelois et al., 2018; Cassano et al., 2019). Regardless of whether the evaluation is conducted internally or externally, the primary objective remains to ascertain the level of quality across all aspects of the educational institution and to identify opportunities for enhancement through pertinent recommendations from subject matter experts (Romlah et al., 2021).

Dimensions of quality in ODL

Quality presents a formidable challenge due to its multifaceted nature, as it encapsulates various factors including, but not limited to, learner and educator satisfaction, learning outcomes, and the societal impact of the education imparted (Esfijani, 2018). Moreover, dimensions of quality could be classified according to the technology utilized, the methods of delivery, the communication between educators and learners, and the overarching educational framework. Singh & Thurman (2019), underscores the fact that ODL is based on Internet, placing a high priority on the learning experience, and catering to the varied profiles of the participants.

According to Stracke (2019), quality dimensions should be determined in advance, guided by relevant data and the needs of the intended audience. Quality development in education hinges on several key factors which are not standalone, but rather interconnected, collectively contribute to the overall quality of learning. These include availability of well-designed educational material, development of educational objects, effectiveness of presentation methods, conduciveness of the learning process, and achievement of favourable outcomes.

ODL should be underpinned by effective practices that ensure the delivery of quality education (Lewis, 2021). It is imperative to note that the success of ODL does not rest solely on the teacher's capabilities but requires a comprehensive approach. This entails considering factors such as e-learning administration, e-learning courses, e-learning environments, and remote learners' satisfaction (Schrenk et al., 2021; Dhendup, 2023).

Design of an ODL program is a pivotal aspect that warrants meticulous attention. Effective pedagogy in this context is dependent on well-organized lessons. To accomplish this, several resources and procedures are needed, and the teaching process should encourage active student engagement. This necessitates an educator who has the capacity to inspire, possesses an in-depth understanding of both the subject matter and the technology employed, and can adeptly bridge the gap between theory and practice (Stephens et al., 2022). By satisfying these prerequisites, learners will feel actively involved in the educational process and will be motivated to augment their own development (Bin Mubayrik, 2020).

Furthermore, the learning environment should be designed in a way that encourages collaboration and guarantees easy access to lessons. Level of interaction between trainers and trainees is an important quality indicator according to Diep et al. (2019). This should be coupled with the provision of appropriate technological resources for monitoring, considering the role of educator (Lewis, 2021), evaluation and feedback (Marquis, 2021). In addition, self-reflection, and self-evaluation activities, such as the use of e-portfolios, are crucial components of the learning process (Bin Mubayrik, 2020; Di Silvestro & Nadir, 2021). These activities enable students to monitor their growth and evaluate their learning, thereby fostering a sense of ownership and responsibility towards their education.

Ultimately, educational quality is deeply rooted in learner satisfaction. Sánchez et al. (2021) postulate that the realization of positive outcomes is contingent upon the satisfaction of learners. This proposition underscores the correlation between the quality of education and the degree of satisfaction among learners. Paralleling this viewpoint, Markova et al. (2017) further accentuate the pivotal role of student satisfaction within the educational process. Their research purports that a student's perception of their educational trajectory profoundly impacts their level of satisfaction, thus bolstering the significance of quality within education. Trainees perceive themselves as efficacious when they are recipients of timely feedback, delivered with a constructive approach from their tutors (Czahajda & Černko, 2021). As learning is a perpetual process, the facilitation of online interactions and the interchange of viewpoints amongst stakeholders via collaborative efforts proves advantageous (Schrenk et al., 2021).

Regarding quality indicators, Darwis et al. (2021) proposed a model to measure quality in four areas: flexibility of students, which refers to their ability to attend classes at their own convenience within specific time frames, quality of the technology used in providing services, which significantly impacts the satisfaction and opinions of participants, educational competence of educators and their knowledge relevant to the educational process, and overall organization and management of the program. Lee et al. (2019) acknowledged that the quality of education is closely tied to the active involvement and participation of learners and identified various indicators that influence both F2F and distance learning in levels of: learners' desire to learn, motivation, willingness to ask questions, behavioural and emotional reactions, interest in learning, engagement in discussions with classmates, ability to organize a learning/reading plan, their commitment to systematic reading. In addition to participants' satisfaction, Abdullah (2022) examined two main indicators, namely the material and the management, and analysed the level of participant engagement as well as the presence of internal, or external incentives for learning.

Finally, Muller et al. (2020) for the evaluation of the program examined whether it meets specific goals and requirements that have been set, analysed the control of learning outcomes, whether there is the appropriate support for the participants, checked the attendance rates and whether there are percentages of learners who dropped out of school, the readiness of the educators, the evaluation that took place during the program, the satisfaction of those involved from the program itself, as well as from the educational material that was produced for them.

Methodology

Aim and research questions

The study seeks to explore the perceived importance of quality indicators in ODL, specifically within the context of adult education. Based on the review, it can be concluded that there exists a multitude of quality factors deemed crucial in contributing to the satisfaction of trainees. It is an established fact that researchers invariably select specific factors for their analysis, primarily focusing on the social interaction amongst the participants and their resultant satisfaction.

Therefore, this study examines those quality factors in a comprehensive manner, with the aim to identify and highlight the elements that trainees themselves believe should be incorporated into a high-quality training program. This study places significant emphasis on the perspectives of the trainees, as their satisfaction and perceived value of the program are understood to be central to its overall quality. Here, the most common aspects of educational quality, as outlined in the literature review, have been collated. The intention is to ascertain whether the perceptions of those educated within the Greek context align with the findings of the international academic literature.

To achieve this goal, 3 thematic areas were chosen based on the literature review, with each area including various quality indicators (Table 1):

- Training preparation.
- Training implementation.
- Training assessment.

Based on these thematic areas, the research questions were formulated, as follows:

RQ1. Which are the trainees' perceived importance of the ODL quality indicators?
RQ2. How demographics affects the perceived importance of the ODL quality indicators?

Table 1. Quality Thematic Areas and Indicators

Thematic Areas	Indicators	Corresponding studies
Training preparation (training institution, human resources)	1. Infrastructure 2. Administration 3. Trainees' support 4. Collaboration 5. Trainers' knowledge 6. Trainers' pedagogical skills 7. Trainers' problem-solving skills	Machado (2007), Diep et al. (2019), Gouvias et al. (2019), Littlefield et al. (2019), Bhowmik et al. (2021), Czahajda et al. (2021), Darwis et al. (2021), Abdullah (2022), Gillaspy et al. (2022), Aranyi (2022), Stephens et al. (2022), Zheng (2023)
Training implementation	8. Clear definition of learning goals 9. Interactive educational content 10. Interaction/engagement 11. Collaborative learning activities 12. Application of theory to practice	Machado (2007), Lee et al. (2019), Diep et al. (2019), Brown et al. (2021), Lewis (2021), Bhowmik et al. (2021)
Training assessment	13. Assessment/feedback 14. Self-assessment 15. Peer-assessment 16. e-Portfolio	Littlefield et al. (2019), Muller et al. (2020), Bin Mubayrik (2020), Marquis (2021), Di Silvestro (2021), Stephens et al. (2022)

Research instrument

A survey questionnaire was constructed, based on the indicators derived from the corresponding literature review (Table 1). The questions, aimed at gauging views and perceptions of the participants, were structured on a Likert scale (from 1: lowest to 5: highest response value). The questionnaire is composed of 28 questions in total:

- Part A: nine (9) questions pertaining to demographic data (Table 2).
- Part B: sixteen (16) closed-ended questions primarily revolve around quality indicators (Table 1) and the participants' perception of their importance. It was found to have a high level of internal consistency, as determined by Cronbach's alpha of 0.937.
- Part C: one (1) open-ended question revolve around understanding of the participants' viewpoints on the quality criteria in the educational process, one (1) closed-ended question about the significance of trainees' satisfaction and one (1) open-ended question justifying their selection.

To ensure higher construct and face validity and the accuracy of the translation of the indicators in Greek, an initial piloting testing with 2 e-learning experts and a closed group of 20 adult learners was performed. After all the necessary adaptations to the survey items, responses were collected using Google Forms, coded with Microsoft Excel, and analyzed with IBM SPSS v.26.

Survey sample

The target group of the survey consisted of adult learners, who had participated in at least one online distance training program organized by the Lifelong Learning Centre, University of the Aegean, Greece, during the period 2020-2022.

Examining the sample characteristics (Table 2) based on the online questionnaire responses (N=203), it is interesting to highlight that most of the trainees were females, between 31-35 years old, not married, having postgraduate studies and previous experience in ODL, mainly working as teachers in the public sector, with work experience between 1-5 years.

Table 2. Sample Characteristics

Demographics	Frequency
Gender	M: 78 (38.4%), **F: 125 (61.6%)**
Age	18-25: 3 (1.5%), 26-30: 30 (14.8%), **31-35: 90 (44.4%),** 36-39: 33 (16.2%), 40+: 24 (11.8%), 50+: 23 (11.3%)
Family status	married: 76 (37.4%), **non-married: 127 (62.6%)**
Education	secondary education: 5 (2.4%), post-secondary education: 7 (3.4%), bachelor: 49 (24.2%), **MSc: 135 (66.5%)**, PhD: 7 (3.5%)
Previous experience in online seminars	**Yes: 169 (83.2%)**, No: 34 (16.8%)
Studies at Hellenic Open University	Yes: 38 (19.7%), **No: 165 (81.3%)**
Experience in online teaching	Yes: 44 (21.7%), **No: 159 (78.3%)**
Profession status	**Public sector (teachers): 131 (64.5%),** Private sector: 72 (35.5%)
Years of experience	**1-5: 83 (40.9%)**, 6-10: 53 (26.1%), 11-15: 24 (11.8%), 16+: 43 (21.2%)

Table 3. Trainees' perceived importance level of training institution in ODL

Trainees' views (responses)	Infrastructure	Administration	Trainees' support
Unimportant	2 (1%)	2 (1%)	5 (2.5%)
Slightly Important	14 (6.9%)	14 (6.9%)	11 (5.4%)
Moderately Important	**67 (33%)**	41 (20.1%)	56 (27.6)
Important	57 (28.1%)	**82 (40.4%)**	60 (29.6)
Very important	63 (31%)	64 (31.6%)	**71 (35%)**
Total	203 (100%)	203 (100%)	203 (100%)

Results

Trainees' perceived importance of the ODL quality indicators (RQ1)

Regarding the trainees' perceived importance of the ODL quality indicators (RQ1), we examined the responses regarding the indicators of the three thematic areas presented in Table 1, namely '*training preparation'*, '*training implementation'* and '*training assessment'*, corresponding to items 11-26 of the survey questionnaire.

For the perceived role of the *training institution* to the quality of the ODL training programs (Table 3), 72% of the respondents stated as "Very Important/Important" the "Administration" indicator, 64.6% the "Trainees' support" indicator and 59.1% the "Infrastructure" indicator.

For the perceived role of human resources to the quality of the ODL training programs (Table 4), 75.2% of the respondents stated as a "Very Important/Important" the "Collaboration" indicator, 73.9% the "Trainers' pedagogical skills" indicator, 71.4% the "Trainers' knowledge" indicator and 69.9% the "Trainers' problem-solving skills" indicator.

For the perceived role of educational design to the quality of the ODL training programs (Table 5), 78.8% of the respondents stated as a "Very Important/Important" the "Interactive educational content" indicator, 73.9% the "Application of theory to practice" indicator, 73.4% the "Clear definition of learning goals" indicator, 57.6% the "Collaborative learning activities" indicator and 55.2% the "Interaction/engagement" indicator.

Regarding the role of *evaluation* to the quality of the ODL training programs (Table 6), 70.4% of the respondents stated as a "Very Important/Important" the "Assessment/feedback" indicator, 57.6% the "Self-assessment" indicator, 52.7% the "Trainers' knowledge" indicator and 50.8% the "e-Portfolio".

Table 4. Trainees' perceived importance level of human resources in ODL

Trainees' views (responses)	Collaboration	Trainers' knowledge	Trainers' pedagogical skills	Trainers' problem-solving skills
Unimportant	1 (0.5%)	1 (0.5%)	2 (1%)	5 (2.5%)
Slightly Important	17 (8.4%)	8 (3.9%)	13 (6.4%)	16 (7.9%)
Moderately Important	32 (36.9%)	49 (24.2%)	38 (18.7%)	40 (19.7%)
Important	75 (36.9%)	69 (34%)	72 (35.5%)	**78 (38.4%)**
Very important	**78 (38.3%)**	**76 (37.4%)**	**78 (38.4%)**	64 (31.5%)
Total	203 (100%)	203 (100%)	203 (100%)	203 (100%)

Table 5. Trainees' perceived importance level of educational design in ODL

Trainees' views (responses)	Interactive educational content	Interaction/ engagement	Clear definition of learning goals	Collaborative learning activities	Application of theory to practice
Unimportant	1 (0,5%)	2 (1%)	3 (1,5%)	2 (1%)	4 (2%)
Slightly Important	11 (5.4%)	31 (15.2%)	17 (8.4%)	33 (16.3%)	21 (10.3%)
Moderately Important	31 (15.3%)	58 (28.6%)	34 (16.7%)	51 (25.1%)	28 (13.8%)
Important	79 (38.9%)	**79 (38.9%)**	**77 (37.9%)**	**82 (40.4%)**	**85 (41.9%)**
Very important	**81 (39.9%)**	33 (16.3%)	72 (35.5%)	35 (17.2%)	65 (32%)
Total	203 (100%)	203 (100%)	203 (100%)	203 (100%)	203 (100%)

Table 6. Trainees' perceived importance level of evaluation in ODL

Trainees' views (responses)	Assessment/feedback	Self-assessment	Peer-assessment	e-Portfolio
Unimportant	2 (1%)	8 (3.9%)	9 (4.4%)	17 (8.4%)
Slightly Important	18 (8.9%)	27 (13.3%)	38 (18.7%)	32 (15.8%)
Moderately Important	40 (19.7%)	51 (25.1%)	49 (24.1%)	51 (25.1%)
Important	**78 (38.4%)**	**88 (43.3%)**	**79 (38.9%)**	**74 (36.5%)**
Very important	65 (32%)	29 (14.3%)	28 (13.8%)	29 (14.3%)
Total	203 (100%)	203 (100%)	203 (100%)	203 (100%)

Finally, Table 7 presents the overall perceived importance of the 16 quality indicators.

Additionally, participants were given the opportunity to respond to two open-ended questions. The first question sought to delineate, based on respondents' perspectives, three parameters defining the quality of a distance learning program, while the second pertained to their belief regarding whether learner satisfaction constitutes a prerequisite for deeming a distance learning program satisfactory.

In response to the first question, most of the participants converged on the viewpoint that interaction between the instructor and learners is essential as it facilitates a better understanding of the subject matter and fosters a sense of belonging to the group. Additionally, the presence of clear educational objectives, the adequate training of instructors, and the integration of theory and practice were emphasized as quality criteria. In justifying these criteria, participants indicated that the aforementioned factors impact societal educational needs and enable substantive rather than superficial learning experiences. Particularly, when instructors possess a profound understanding of the subject matter, they contribute to the awakening of learners' interest and enhance their willingness to engage in the learning process. Ultimately, many underscored the significance of technical infrastructure and the presentation and structuring of educational materials as indicators of quality. In response to the second question, most of the participants affirmed that learner satisfaction is indeed a significant determinant of quality training. Some even argued that participant dissatisfaction implies a misalignment between the program and their needs, and by extension, societal needs. Moreover, it was noted that learner dissatisfaction leads to the conclusion that the program is deficient and in need of improvement. Regarding the perceived role of *satisfaction as an overall indicator* of quality ODL training programs (Table 8), 86.7% of the respondents reported it as "Very Important/Important".

Table 7. Trainees' perceived importance for the quality indicators

Indicator	Mean	Std. Dev.
Interactive educational content	4.12	.895
Collaborative learning activities	4.04	.961
Collaboration	4.04	.961
Trainers' knowledge	4.04	.959
Trainers' pedagogical skills	4.04	.959
Clear definition of learning goals	3.98	.997
Administration	3.95	.940
Assessment/feedback	3.92	.979
Application of theory to practice	3.92	1.023
Trainers' problem-solving skills	3.89	1.021
Trainees' support	3.89	1.028
Infrastructure	3.81	.987
Interaction/engagement	3.54	.971
Self-assessment	3.51	1.021
Peer-assessment	3.39	1.021
e-Portfolio	3.33	1.153

Table 8. Trainees' perceived importance level of satisfaction as an overall quality indicator

Trainees' views (responses)	Training satisfaction
Unimportant	0 (0%)
Slightly Important	0 (0%)
Moderately Important	19 (9.4%)
Important	86 (42.4%)
Very important	**98 (48.3%)**
Total	203 (100%)

Additionally, a principal components analysis (PCA) was run on the 16 items of the questionnaire that measured the perceived importance of the 16 quality indicators by the 203 respondents. The suitability of PCA was assessed prior to analysis. Inspection of the correlation matrix showed that all variables had at least one correlation coefficient greater than 0.3. The overall Kaiser-Meyer-Olkin (KMO) measure was 0.939 with individual KMO measures all greater than 0.7, classifications of 'middling' to 'meritorious' according to Kaiser (1974). Bartlett's test of sphericity was statistically significant ($p < .001$), indicating that the data was likely factorizable. PCA revealed three components that had eigenvalues greater than one and which explained 54.1%, 8.7% and 5.5% of the total variance, respectively. Visual inspection of the scree plot (Figure 1) indicated that three components should be retained (Cattell, 1966).

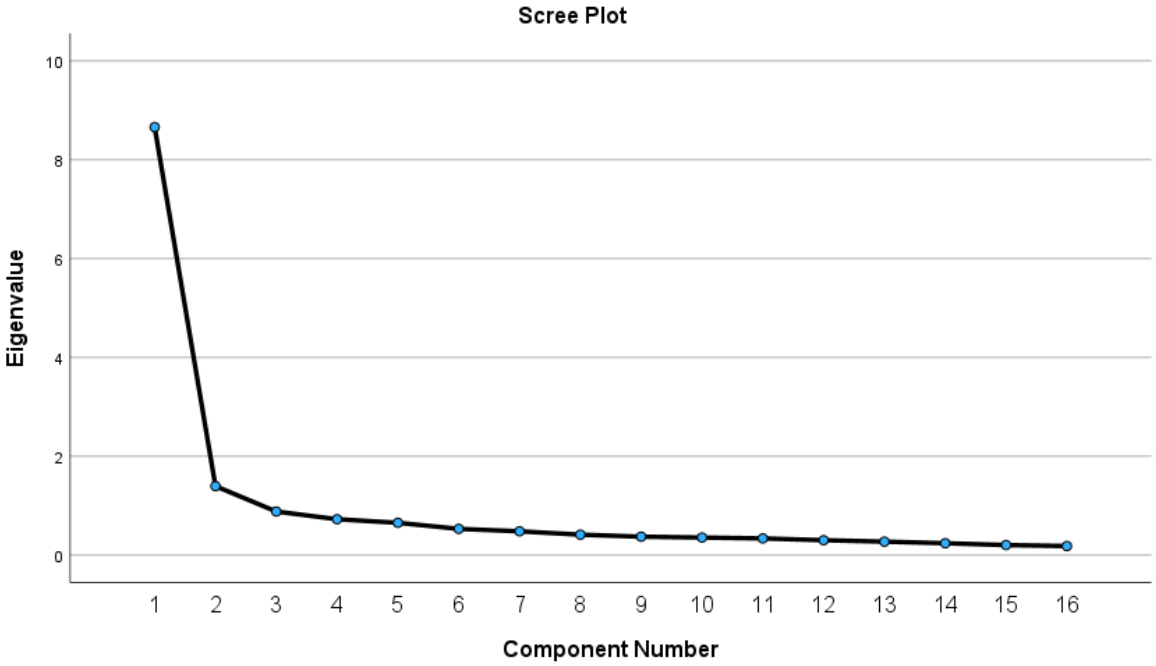

Figure 1. PCA Eigenvalue Scree plot

Table 9. Rotated Structure Matrix for PCA with Varimax Rotation of a Three Component Questionnaire

Items	Rotated Component Coeffecients			
	Component 1	Component 2	Component 3	Communalities
Trainees' support	**.845**	.250	.081	.782
Infrastructure	**.780**	.278	.040	.687
Administration	**.751**	.336	.098	.687
Trainers' knowledge	**.725**	.124	.428	.725
Trainers' problem-solving skills	**.717**	.196	.371	.690
Trainers' pedagogical skills	**.663**	.041	.420	.618
Collaboration	**.630**	.325	.393	.657
Clear definition of learning goals	**.552**	.495	.264	.620
Collaborative learning activities	.115	**.833**	.259	.775
Interaction/engagement	.296	**.769**	.237	.735
Application of theory to practice	.463	**.614**	.343	.709
Interactive educational content	.493	**.543**	.275	.613
e-Portfolio	.094	.196	**.772**	.643
Self-assessment	.266	.393	**.681**	.689
Assessment/feedback	.486	.270	**.609**	.680
Peer-assessment	.208	.471	**.601**	.626

***Note**. Major loadings for each item are bolded*

In addition, a three-component solution met the interpretability criterion. As such, three components were retained. The three-component solution explained 68.3% of the total variance. A Varimax orthogonal rotation was employed to aid interpretability. The rotated solution exhibited 'simple structure' (Thurstone, 1947). The interpretation of the data was consistent with the perceived quality areas and indicators the questionnaire was designed to measure with strong loadings of 'program preparation' items on Component 1, 'program implementation' items on Component 2 and 'program assessment' items on Component 3, with the only exception of the item "Clear definition of learning goals" which better loads to Component 1 rather Component 2. Component loadings and communalities of the rotated solution are presented in Table 9.

Demographics and perceived importance of the ODL quality indicators (RQ2)

Regarding the examination of the correlation between demographics and the perceived importance of the ODL quality indicators (RQ2), the non-parametric tests Mann-Whitney U test and Kruskal-Wallis were used. More specifically, a Mann-Whitney U test was run to determine if there were differences in the levels of perceived quality indicators (dependent variables) between gender, family status, previous experience in online seminars, studies at Hellenic Open University and experience in online teaching (independent variables) (Table 10).

Table 10. Group differences between demographics and perceived quality indicators

Indicators	Mann-Whitney U Test (Sig.[a, b])				
	Gender	**Family status**	**Previous experience in online seminars**	**Studies at Hellenic Open University**	**Experience in online teaching**
Infrastructure	0.11	**0.02**	0.40	0.16	**0.00**
Administration	0.13	0.29	0.36	0.54	0.21
Trainees' support	0.38	0.21	0.25	0.42	**0.01**
Collaboration	0.39	0.78	0.88	0.49	0.10
Trainers' knowledge	0.09	0.13	0.59	0.47	0.28
Trainers' pedagogical skills	0.19	0.12	0.27	0.73	0.42
Trainers' problem-solving skills	0.24	0.41	0.11	0.74	0.24
Interactive educational content	0.35	0.39	0.92	0.88	0.34
Interaction/engagement	0.12	0.41	**0.01**	0.18	0.26
Clear definition of learning goals	0.30	0.53	0.33	0.78	**0.01**
Collaborative learning activities	0.10	0.42	**0.03**	0.09	**0.04**
Application of theory to practice	0.58	0.35	0.72	0.54	0.15
Assessment/feedback	0.68	0.16	0.53	0.46	0.67
Self-assessment	0.41	0.33	0.75	0.17	0.17
Peer-assessment	0.68	0.72	0.84	0.80	0.45
e-Portfolio	0.36	0.31	0.48	0.72	0.99

a. The significance level is .050. b. Asymptotic significance is displayed.
***Note**. Rejection of null hypothesis for each item is bolded.*

Perceived quality indicators' scores for all independent variables were not statistically significantly different, except for the following cases:

- *Infrastructure* indicator scores for married trainees (mean rank = 113.70) were statistically significantly higher than for non-married (mean rank = 95), $U = 5715$, $z = 2.298$, $p = .02$.
- *Interaction/engagement* indicator scores for trainees with previous experience in online training programs (mean rank = 106.82) were statistically significantly higher than those with no previous experience (mean rank = 78.04), $U = 3687.5$, $z = 2.732$, $p = .01$.
- *Collaborative learning activities* indicator scores for trainees with previous experience in online training programs (mean rank = 105.94) were statistically significantly higher than those with no previous experience (mean rank = 82.4), $U = 3539.5$, $z = 2.237$, $p = .03$.
- *Infrastructure* indicator scores for trainees with previous experience in online teaching (mean rank = 105.94) were statistically significantly higher than for trainees with no previous experience in online teaching (mean rank = 82.4), $U = 3539.5$, $z = 2.237$, $p = .002$.
- *Trainees' support* indicator scores for trainees with previous experience in online teaching (mean rank = 122.11) were statistically significantly higher than for trainees with no previous experience in online teaching (mean rank = 96.43), $U = 4383$, $z = 2.690$, $p = .01$.

Table 11. Group differences between demographics and perceived quality indicators

Indicators	Kruskal-Wallis Test (Sig,[a, b])		
	Age	**Education level**	**Years of experience**
Infrastructure	.42	.24	**.02**
Administration	.29	.50	.27
Trainees' support	.40	.46	.16
Collaboration	.19	.37	.31
Trainers' knowledge	.17	.05	**.00**
Trainers' pedagogical skills	.12	.10	.24
Trainers' problem-solving skills	.22	**.04**	**.04**
Interactive educational content	.65	.89	.13
Interaction/engagement	.37	.23	.69
Clear definition of learning goals	.06	.07	.15
Collaborative learning activities	.79	.12	.15
Application of theory to practice	.13	.28	.07
Assessment/feedback	.13	.33	**.02**
Self-assessment	.31	.34	.59
Peer-assessment	.77	.29	.70
e-Portfolio	.97	.33	.11

a. The significance level is ,050.
b. Asymptotic significance is displayed.
***Note**. Rejection of null hypothesis for each item is bolded.*

- *Clear definition of learning goals* indicator scores for trainees with previous experience in online teaching (mean rank = 120.55) were statistically significantly higher than those with no previous experience in online teaching (mean rank = 96.87), $U = 4314$, $z = 2.500$, $p = .01$.
- *Collaborative learning activities* indicator scores for trainees with previous experience in online teaching (mean rank = 117.16) were statistically significantly higher than for those with no previous experience in online teaching (mean rank = 97.81), $U = 4165$, $z = 2.029$, $p = .04$.

A Kruskal-Wallis H test was run to determine if there were differences in the levels of perceived quality indicators (dependent variables) scores between groups of trainees with different age, education, and experience levels (Table 11).

Subsequently, pairwise comparisons were performed using Dunn's (1964) procedure with a Bonferroni correction for multiple comparisons and adjusted p-values. The distributions of the perceived quality indicators scores for all independent variables were not statistically significantly different, except of the following cases:

- *Trainers' problem-solving skills* indicator scores were statistically significantly different between the different levels of education, $\chi^2(5) = 10.011$, $p = .04$. Post hoc analysis revealed no statistically significant differences in scores between the different levels of trainees' education.
- *Infrastructure* indicator scores were statistically significantly different between the different levels of education, $\chi^2(3) = 9.817$, $p = .02$. Post hoc analysis revealed no statistically significant differences in scores between the different levels of trainees' years of experience.
- *Trainers' knowledge* indicator scores were statistically significantly different between the different levels of education, $\chi^2(3) = 15.220$, $p = .002$. Post hoc analysis revealed statistically significant differences in scores between the trainees with 1-5 years of experience (mean rank = 87.22) and the trainees with 16+ years of experience (mean rank = 127.5), but not between any other group combination.
- *Trainers' problem-solving skills* indicator scores were statistically significantly different between the different levels of education, $\chi^2(3) = 8.062$, $p = .045$. Post hoc analysis revealed statistically significant differences in scores between the trainees with 1-5 years of experience (mean rank = 91.41) and the trainees with 16+ years of experience (mean rank = 120.42), but not between any other group combination.
- *Assessment/feedback* indicator scores were statistically significantly different between the different levels of education, $\chi^2(3) = 9.767$, $p = .021$. Post hoc analysis revealed statistically significant differences in scores between the trainees with 1-5 years of experience (mean rank = 93.18) and the trainees with 16+ years of experience (mean rank = 123.84), but not between any other group combination

Discussion

Regarding the first research question about trainees' perceived importance of the ODL quality indicators, in this study, literature review led to a group of three main quality axis for ODL, namely training preparation (educational institution and human resources), training implementation and training assessment. In relation to educational institutions, four pivotal quality indicators have been identified that significantly influence their perceived importance.

Bhowmik et al. (2021) corroborated in their research that the role of infrastructure is instrumental in augmenting the program's quality. When this is combined with the suitable provision of student support from the educational institution, it results in the overall satisfaction of the trainees (Abdullah, 2022). From the survey results it became evident that all the indicators hold considerable perceived

importance for the trainees, where the most prominent indicator identified is that of the organization and administration of the program.

It is pertinent to draw attention to the substantial role that human resources play in the quality of ODL programs, as corroborated by literature. In line with the examination of the institution's contribution, four significant quality indicators were examined, which were deemed most critical. Abdullah (2022) highlights the crucial role of collaboration between all parts in a training program. They suggest that this is instrumental in enhancing the overall program, thereby improving its quality. They concur that trainers should possess not only cognitive and pedagogical skills, but also the ability to address and resolve a variety of problems when confronted with challenging situations. The survey results resonate with the existing literature, with respondents affirming the importance of these factors. Interestingly, the contribution of human resources appears to surpass that of the institution, as evidenced by higher preference percentages and collaboration was identified as the most significant quality indicator, as Andrianou (2021) had also cited.

Furthermore, the planning and implementation of ODL courses are of paramount importance. As demonstrated in several studies such as Bhowmik et al. (2021), interactive educational material is integral to the educational process. It aids in eliminating any barriers to comprehension of the cognitive object and often stimulates learners' interest. Other significant factors include the interaction between participants, which facilitates the exchange of ideas and discussion on the course content, as well as the establishment of clear teaching objectives by the instructors (Abdullah, 2022). In relation to the delivery of teaching, it is insufficient to merely present the lesson. Brown et al. (2021) highlight that the allocation of collaborative tasks is a crucial element that enhances understanding of the cognitive object and stimulates their interest and participation. Also, it is essential for instructors to possess knowledge of the subject matter and to be pedagogically competent. Hence, the integration of theory and practice is an unrivalled quality indicator. This not only leads to learner satisfaction but also promotes the development of their knowledge, thereby ensuring high-quality learning (Aranyi et al., 2022; Stephens et al., 2022). Survey results on these indicators are quite intriguing. The most significant quality indicator was interactive educational material. The correlation between theory and practice was also a notable indicator, as was the existence of clear teaching objectives. Despite expectations that participant interaction would be at comparably high levels, this was not the case. We therefore deduce that learners are more interested in how the lessons are conducted, viewing this as the foundation of the educational process, rather than interaction with other participants.

Evaluation and assessment are pivotal elements within the educational process, as they foster internal motivation and drive continuous improvement among trainees. This notion is echoed in the research by Luckritz Marquis et al. (2021), where the feedback provided by the trainer to the trainee was identified as a significant quality factor. Similarly, the current research reveals that trainees place considerable importance on the assessment and feedback they receive from their instructors, ranking this aspect as the most crucial within the domain of assessment. This finding underscores the integral role that constructive feedback plays in enhancing the learning experience and fostering an environment conducive to growth and development. Furthermore, the study highlights the significance of self-assessment and peer-assessment. These elements not only engender a sense of belonging and active participation in the educational process (Bin Mubayrik, 2020) but also equip trainees with the skills needed to critically evaluate their own performance and progress. The creation of an e-portfolio also emerged as an important quality indicator. This tool facilitates the documentation of a trainee's work and allows for the visualization of their progress over time (Di Silvestro et al., 2021). However, despite their perceived importance, the study found that these three quality indicators - self-assessment, peer- assessment, and e-portfolio creation - were not regarded as overwhelmingly significant by the respondents. This finding suggests that while these aspects are valued, they may not be seen as the most crucial elements of the training process.

According to the open-ended questions of the survey, the primary indicators of quality appeared to be the interaction between the trainer and the trainee, the establishment of clear objectives, the integration of theory and practice, and the adequate training of the trainers. More specifically, the interaction between the instructor and trainee was highly valued by the participants, often ranking as the most important factor, and was deemed essential for quality training. Similarly, the satisfaction of the trainees from an online distance training program held a significant position. Most participants believed that trainee satisfaction is intrinsically linked to the quality of a program, as dissatisfaction could potentially lead to withdrawal from the program.

Finally, regarding the second research question about the relation between demographics and perceived importance of the ODL quality indicators, inductive analysis identified several key elements. More specifically, implementation of collaborative tasks has been identified as a vital quality factor, particularly for individuals with undergraduate or graduate studies. This aspect also holds significant importance for those employed as adult trainers and those with experience in distance education. The relation between theory and practice is also a crucial indicator for those having completed undergraduate or graduate studies. This suggests that individuals with advanced educational qualifications place a high value on the practical application of theoretical knowledge. Results also indicate that student support is paramount for those engaged in adult education as educators. This implies that providing adequate support to students is a critical aspect of the teaching process in adult education.

Conclusions, future work and limitations

This study contributes to recent literature on critical factors that enhance quality of adult learning in online environments. Even though numerous prior research had suggested quality metrics and indicators in ODL (Diep et al., 2019; Czahajda & Černko, 2021; Dhendup, 2024), this study managed to effectively consolidate previous research into a coherent framework and examine in a comprehensive manner the perceived importance of 16 quality indicators for online distance education, selected by a thorough review of the literature.

Overall, the findings highlight the importance of collaborative tasks, the connection between theory and practice, and student support, particularly in adult education and distance learning. Moreover, highlights the fact thar there are specific conditions that must be met for quality assurance in ODL training. These conditions may depend on the environment, trainers, institution, and assessment. Therefore, if all the quality indicators mentioned above are met, combined with the satisfaction of the trainees, then a program can be considered a qualitative one. Moreover, quality in an ODL program strongly supports trainees' intention to continue and finish the program.

As distance learning continues to grow in popularity, institutions must prioritize quality assurance to ensure that their programs meet specific standards and provide trainees with a more rewarding and fulfilling learning experience, an over-all high-quality education. Results of this study provide valuable insights for educators and policymakers in the field of ODL training and highlights important aspects of e-learning quality, offering a better understanding about the perceived importance of quality indicators. This study also suggests that stakeholders should take a primary role in the development of quality frameworks, as they are an important reference for any change.

Even though this study faces some limitations (for example a non-generalizable sample with moderate size, selected from only one lifelong learning center with convenient sampling, or the absence of other variables like completion rate or assessment scores), nevertheless it could be used as a basis for the creation of an e-learning evaluation scale and as a quality checklist during the design phase of online training programs. Especially in the context of e-Learning Support Centers, existence of a quality framework is of great importance as it may serve as a blueprint for planning and administrating

sustainable and efficient online training programs, through a more uniform and standardized operationalization of their processes (Kasapidis et al., 2023).

Moreover, evidence for output- and outcome-oriented approaches for quality factors identification and measurement is missing from the literature, while there is a tendency to focus on a single aspect of quality measurement in ODL. Addressing this shortcoming, this study highlights the fact that there is a need for a holistic approach to consider quality factors in different aspects, that is, inputs, resource, processes, outputs, and outcomes (Esfijani, 2018).

In this context, future researchers may consider adopting the proposed indicators list to measure e-learning impact in relation to the overall participation and satisfaction of the trainees, triangulating the results with more objective measures in online environments like learning analytics. Towards this direction, longitudinal studies and (quasi-)experimental are strongly recommended so that the causal mechanism through which quality indicators, participation and satisfaction can be uncovered. In so doing, we can better be informed about the possible causal nature and the direction of causality between ODL design and implementation and quality indicators.

Finally, as quality in ODL is measured mainly quantitatively, this has the effect of overlooking or omitting important elements related to it. So, it would be interesting to examine additional qualitative data for a more comprehensive inquiry into the trainees' perceptions about quality, in relation to actual trainees' satisfaction, assessment scores and drop-out rates. And it would be of great interest to comparatively inquire about various good practices for ODL adult training, as it is now established as the main delivery mode for lifelong learning, especially after COVID-19 pandemic.

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