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A study of factors associated with online training on performance and satisfaction of academic counsellors

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Abstract: The main objective of the study is to identify a set of factors with regard to online training environment that may lead to increased performance and satisfaction for online trainees. Around 722 academic counselors who will join the Academic counselors training programme (ACT-Online) of IGNOU and around 20 instructors/evaluators involved in the training programme will form the sample of the study. Two scales (Grasha & Reichmann's Student Learning Styles Scale, Attitude Towards E-learning Scale) and three questionnaires were used (i) to study the perception of the participants and their level of satisfaction, (ii) to assess the performance of the participants before the training, (iii) to assess the performance of the participants after the training will be used for the study. All the questionnaires and scales will be administered online. The instructors/evaluators will be interviewed by the researcher in face-to-face situation. Both qualitative and quantitative analyses methods (Mean, SD, ANOVA, Correlation Matrix, Principle Component Factor analyses etc.) will be used. The data will be analysed using SPSS. The findings of the study would help the university to find out the effectiveness of the online training and also to improve the quality of ongoing and future online training programmes. The researchers in ODL, teachers, administrators, policy makers and others who want to deliver training programmes through online mode would also be benefited from the findings of this study.

Keywords: online training, Academic Councellors, Satisfaction, performance, learning style, attitude

Introduction

The fast changes and augmented complexity of today's world present new confront and put new demands on the teaching learning system. There has been a rising responsiveness of the essential to transform and improve the preparation of learners for dynamic execution in the frequently changing and highly challenging environment. Technology has brought a lot of transforms in the way education is delivered today. Educational performances are supported to be more interactive, personalized, reachable, and computer-mediated, and flexible in interface. Technology supports help learner to learn more efficiently at their own pace and time.

E-learning and online learning is appropriately accepted day-by-day. It is defined as designed teaching/learning practices that use a wide range of technologies to attain learners. Online learning can cover a variety of activities from supporting learning, to blended learning (the combination of conventional and online learning practices), and teaching that is delivered entirely online. Online learning is no longer simply connected with distance or remote learning, but forms part of a conscious choice of the best and most suitable ways of encouraging effective learning.

Training and continuing professional development of open distance learning (ODL) functionaries (both full time and part-time) are important for success of this system. IGNOU took an initiative in 2010 to

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train several thousand academic counsellors through online (ACT-Online). The ACT-Online model (Figure 1) was developed after thorough literature review and infrastructure available at IGNOU. Since, this was first attempt by IGNOU to train a large number of academic counsellors using online environment, it is extremely important to study the factors associated with the new learning/training environment. Thus, the aim of the present research is to study the factors associated with online training on performance and satisfaction of academic counsellors of IGNOU.

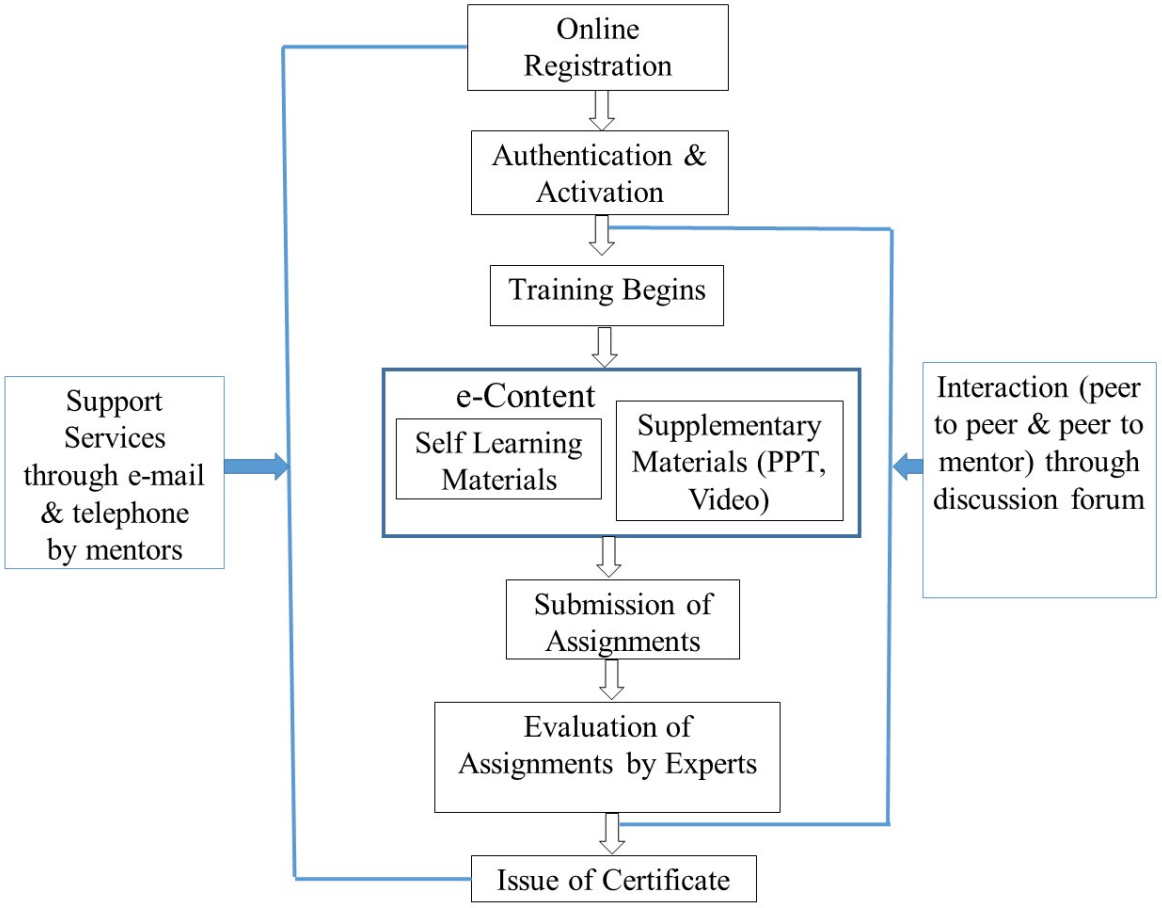

Figure-1: Existing ACT-Online Training Model at IGNOU

Literature Review

Researchers have shown interest in exploring trends in distance education research during the last two decades (e.g. Bozkurt el al., 2015; Zawacki-Richter, 2009; Zawacki-Richter & Anderson, 2014; Zawacki-Richter, Backer &Vogt, 2009; Mishra, 1997).

A detailed literature review has been done for the present study. A few important and relevant studies have been mentioned in the following paragraphs. Rossen & Hartley (2001) defined “e-Learning as anything delivered, enabled, or mediated by electronic technology for the explicit purpose of learning. The term includes Online learning, Web-based learning, and Computer-based training”. The Sloan Consortium found learner satisfaction as one of the pillars of quality in e-learning education (Lorenzo & Moore, 2002).

Acceptance of online learning involves new skills for both the teacher and the learner (Sharma, 2001). Educational practice moves from teacher-centered to learner-centered. Teachers become facilitators

between the learners and the resources they need for their own self study. These changes challenge instructors and may prompt insecurities (Bower, 2001). Some studies expose a broad lack of rendezvous in online learning and apprehension about its potential among instructors. It was accredited to short of of resources and support from the organization, lack of time to carry out such a challenging activity, lack of information, knowledge, skill and capability in online learning technologies (Naidu, 2003; Sellani & Harrington, 2002; Pajo & Wallace, 2001). Garcia-Beltran & Martinez (2005) brought up that one limitation in the execution of educational online systems is the lack of technology, skill, knowledge and familiarity among the instructors. Latchem (2004) said that faculty can experience many efforts when educational institutions shift into open and flexible learning and introduce new ideas and practices that are neither accepted by the stakeholders, or faculty who are conventional values and practices.

The quality of well-designed and developed online learning courses attracts the learners when taking into consideration for e-Learning. Information and Communication Technologies helps the learners to get involve in collaborative and cooperative learning to gain conceptual knowledge through online learning (Sharma, 2010; Leidner & Jarvenpaa, 1995).

Quality of the technology, internet connectivity and usability of the technology are matters in online learning (Piccoli et al., 2001). Malik (2010) shared his views that the faculty role is also very vital in online learning environment. Learner requirement from faculty and their prompt response definitely influences learner fulfilment. The group discussions initiated by faculty are very valuable and learners benefit from the learning environment.

Though technology is importunate in education, it has not been seriously infused in the performance of teaching and learning (Grabe & Grabe 2008). Some studies suggest the need for valuable ways to support, encourage, and provide techaers with the skills and capability to adopt and efficiently use technology in education (Hagenson & Castle, 2003; McKenzie, 2001). Teacher's attitude and skills are essential for ICT to be accepted within a curriculum and instructional design (Saade´ et al. 2007). To successfully incorporate ICT tools into teaching and learning preparations, faculty should equip themselves to use technology and mind set to accept the changes happening in the education sectors (Fabry & Higgs, 1997; Hagenson & Castle, 2003; Schrum et al. 2002; Zhao & Cziko, 2001). Keengwe, Kidd & Kyei-Blankson (2009) stated that educational institutions should facilitate and motivate the instructors in their activities by overcome difficulties in the technology adoption also they expressed that management must provide guidance, motivation, encouragement, and widen resources to the continuous professional development. Many experimental studies tried to measure learners learning along with learner satisfaction, which helps for measuring e-learning success (Song & Bosselman, 2011).

E-learning has become essential delivery mode of open distance learning (ODL) in secluded isolated areas in developing countries as well. Suniti & Tara (2012) explores "the paradigm shift in learning culture brought about by the advent of online learning in the mostly print-based ODL system at the Mauritius College of the AIR. They studied behaviour patterns engendering a new ethos conducive to effective e-learning. They have provided suggestions to alleviate the impersonality and isolation of the virtual mode. Their study is based on an e-network project known as *Pan African e-network project*- the most ambitious programme of distance education in Africa ever undertaken (Chand, 2010).

Nanda and Saxena (2013) also expressed this new form of online learning and look into its impact on the African learning community. They reported that the learners were greatly profited and the insisted for such form of education had also increased.

Munyoka (2013) argued that considered impact and achievement of such implementations is necessary to decide effectiveness of advanced efforts in terms of learner satisfaction and personal impact. He made an effort to assess the impact of tele-education as new ODL mode on learners at college of distance open learning in Botswana. The study concludes that tele-education has positive impact on the way students are learning.While analysing the impact of online learning systems on learners, Alkhalaf, Drew & Althussain (2012) stated that both quality of system and quality of information affect utilize and learner satisfaction.

Objectives

The following objectives have been formulated for the study.

1. To identify a set of factors with regard to online training environment that may lead to improved performance and satisfaction for online trainees;
2. To examine the nature of correlations between various factors (as mentioned in objective no. 1) and level of performance of the trainees;
3. To identify a set of characteristics of the trainees that could lead to successful completion of the online training programme;
4. To examine the nature of correlations between various characteristics (as mentioned in objective no. 3) and level of performance of the trainees;
5. To study the learning styles of the trainees and the nature of relation between the learning styles and the trainees' performances;
6. To find out a set of factors that could work as barriers to online training; and
7. To suggest a framework for modified online training environment (ACT-Online), if necessary.

Hypotheses

1. There is no set of factors with regard to online training environment that could lead to improved performance and satisfaction for online trainees;
2. There are no specific characteristics of the trainees that could lead to successful completion of the online training programme;
3. There is no relation between the learning styles and trainees' performances;
4. There are no specific factors that could work as barriers to online training.

Limitations of the study

- This study is delimited to the trainees who have registered and activated for online training in the ACT Online Programme of IGNOU during 2010 to 2013.
- Only the demographic and attitudinal factors and learning styles of the participants have been considered for this study.
- Only the completely filled-in questionnaires were taken for analysis.

Methodology

Tools

The following tools were selected for the study.

(i) Grasha Riechmann student learning style scales (Grasha, 1996)

Grasha-Riechmann Student Learning Style Scale (GRSLS) was used to find out the participants' learning style before they joined the ACT-Online training programme. This instrument consists of 60 Likert-type items with a five 5 point rating scale from strongly disagree to strongly agree. Based on the scale, six different learning styles can be identified: *competitive, collaborative, avoidant, participant, dependent, and independent.*

(ii) Attitude towards e-learning (Mishra & Panda, 2007)

To study the attitude towards e-learning, a tool developed by Mishra and Panda (2007) was selected. This instrument consists of 22 Likert type items with a 5 point rating scale from strongly disagree to strongly agree.

(iii) Pre-training assessment questionnaire

The pre-training assessment questionnaire was developed by the researcher. This includes true/false questions, multiple choice questions and short questions. The total score is 100. The questionnaire consists of the following components: Concept of distance education, Learner support, Techniques for reading study materials, Media used for learner support, Tutor comments, Academic counselling, and Basic computer knowledge. The content validation was done by seven experts.

(iv) Post-training assessment questionnaire

This questionnaire is similar to Pre-training assessment questionnaire. The content validation was done by the same experts. The difficulty level of both the questionnaires are equal.

(v) Satisfaction and feedback questionnaire

This questionnaire was designed and developed to study the satisfaction and feedback from the participants who have successfully completed the online training programme. This questionnaire has 16 Likert type items with 5 point rating scale and three open-ended questions.

(vi) Questionnaire for barriers towards online training

This questionnaire is developed to identify factors work as barriers to online training. This questionnaire administered to the participants who have not completed the online training programme. The content validation was done by same experts. The content validation was done by the same experts.

(vii) Interview schedule

A semi-structured interview schedule was developed to collect information and opinions from the experts who were involved in the processes of design, development and implementation of ACT-Online programme.

Research Sampling

Population

Academic counsellors of IGNOU and the faculty and staff members from various open distance learning (ODL) institutions who were registered (1560) for the Academic Counsellors' Training Online programme (ACT-Online) were considered as population for this study.

Sample

(i) Out of 1560 academic counsellors, 722 participants authenticated and were activated for training it means they were submitted the required documents for the programme and provided user-id and password to participate in the online training. All the 722 participants were considered as sample for this study.

(ii) 20 experts who have experience in the design, development and implementation of online programmes were randomly selected for this study.

Data Collection

All the questionnaires were administered online. The following figure -2 shows the stages of data collection for this study.

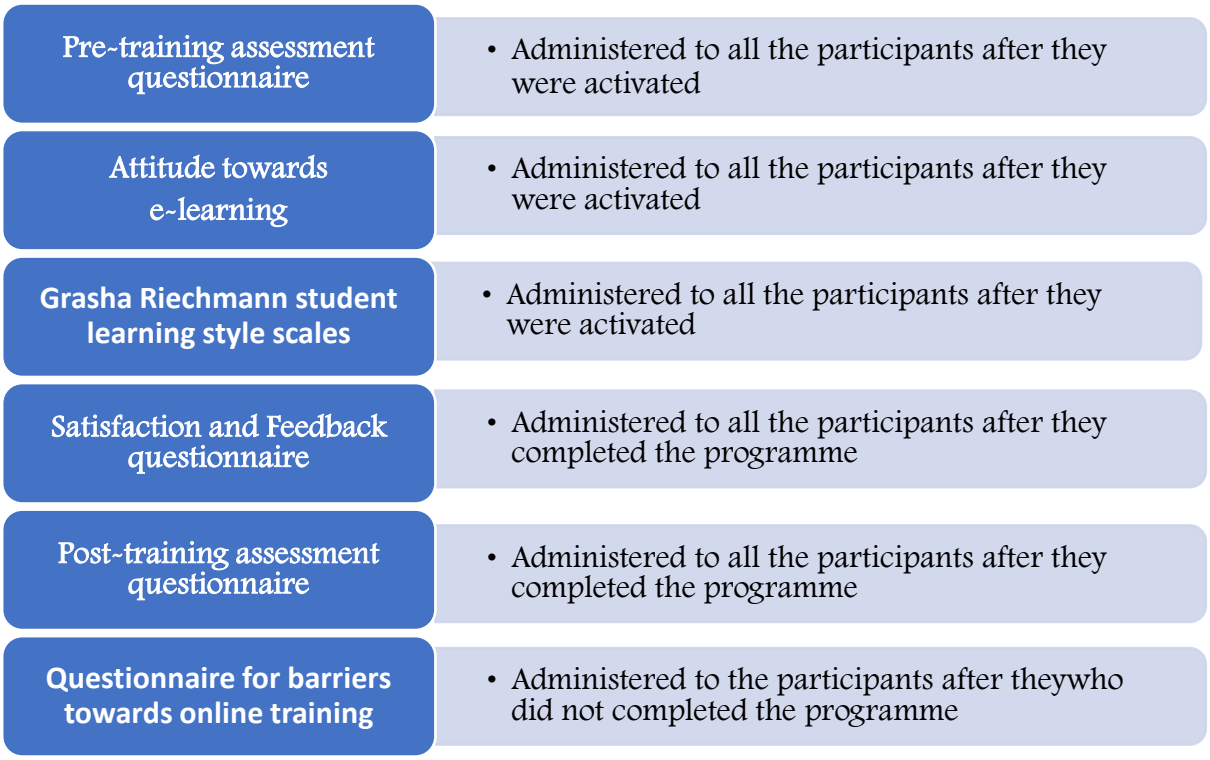

Figure-2: Stages of data collection

- Pre-training assessment questionnaire was sent to the participants through e-mail and same received back online to actonline@ignou.ac.in.
- Attitude towards e-learning and learning style questionnaires were placed in the ACT-Online website (www.actonline.ignouonline.ac.in) and data were stored in MySQL database.
- Satisfaction and feedback questionnaire was also placed in the ACT-Online website, link was sent to the participants and data were stored in MySQL database.
- Post-training assessment questionnaire was sent to the participants through e-mail and same received back online.
- Questionnaire on barriers towards online training was sent to the participants through e-mail and same received back online.

Analysis and Interpretation

The main objective of this study was to find a set of factors associated with online training environment that may lead to improved performance and satisfaction for online trainers, in this case the academic counsellors of Indira Gandhi National Open University (IGNOU). The main findings have been presented and interpreted based on the objectives of the study.

Demographic characteristics of the participants

The analyses of information about the personal profile of the participant trainees which included gender, age, marital status, qualifications, discipline, experience, designation and area of residence of the participants. The background information of 722 participants who registered for the ACT-Online programme of IGNOU during 2010 to July 2013 were analysed.

Majority of the participants of online training programme were male (61.91%), married (74.79%), belonged to urban area (64.13%), belonged to age group of 31-40 years (39.61%), engaged in teaching profession (78.67%), hold post graduate degree (55.96%), and have 5-10 years working/teaching experience (33.24%).

Analysis of performances of the participants (Pre training and Post training)

After completion of the formalities for registration in ACT-Online training programme, the participants were asked to answer a pre-training assessment questionnaire. The purpose of this activity was to study the level of knowledge and skills of the participants in various components of distance education like support services, media use, academic counselling and so on, which are needed to become an effective academic counsellor. Similarly, a post-training assessment questionnaire was administered to those participants who have successfully completed the programme to study the improved level of knowledge and skills. Finally, responses of the 456 participants were considered for analysis as they completed both the pre-training and post-training questionnaires which are needed for analysing the improvement in performances of the participants. It is important to mention that both the questionnaires have similar difficulty level.

Table 1: shows the pre and post training performances of the participants

Assessment	Range of Scores		Total Score	Mean Score	SD	t-value	Significant level
	Min.	Max.					
Pre-Training	40	70	100	55.21	5.51	24.61	P<0.05
Post-Training	65	83	100	74.54	8.62		

It is noted that the scores obtained by the participants in pre training assessment range from 40 to 70 with mean of 55.21, SD=5.51, whereas, the scores obtained by them in the post training assessment range from 65 to 83 with a mean of 74.54, SD=8.62. Both the cases the total score was 100. In other words, the participants showed an improvement of 20 scores (20% improvement) in an average after they completed the training. To study whether the mean difference between pre and post training scores is statistically significant, t-test was calculated. The difference found to be was statistically significant ($t=24.61$, $p<0.05$).

Individual analysis of the performances revealed that some participants have shown 1% improvement and some have shown 40% improvement (as evident from range of scores 1-40). As our intention is to identify a set of factors responsible for improvement performance for online trainees, if we consider all the participants as one group, we may not identify the factors correctly. So, there is a need to divide the participants in sub-groups taking the similar improvement in performances in one sub-group. Thus the participants were divided into 4 sub-groups considering the nature of improvement in performances as described below:

Sub-Group 1: The participants who showed minimum improvement in scores after the training between 1 to 10 only.

Sub-Group 2: The participants who showed improvement in scores between 11 to 20 only.

Sub-Group 3: The participants who showed improvement in scores between 21 to 30 only.

Sub-Group 4: The participants who showed maximum improvement in scores after the training between 31 to 40.

All the sub-group mean scores obtained by the participants after the training found to be significantly different from each other. Gender-wise comparison revealed, female participants have shown significantly greater improvement in mean score than the male participants.

Analysis of level of satisfaction towards online training

One of the important objectives of the present study is to identify a set of factors with regard to satisfaction towards online training and correlation between satisfaction and performance of the participants. A tool (rating scale) on satisfaction towards e-learning was designed and developed by the researcher was sent through online to 525 participants of ACT-Online training programme for this study. The total number of respondents for this tool is 456 (86.85%).

There are three factors derived from the factor analysis and are named **as factor 1: Information and interaction, factor 2: e-content of online training and factor 3: Content of the response.**

Factor 1: Information and Interaction

The following high loadings have been identified in Factor 1: Information on ACT-Online website (0.91), Regular interaction between facilitator and participant (0.90), Activation time (0.88), Regular interaction between participant and Participant (0.83).

Factor 2: e-content of online training

This factor has 2 high loading variables. These are e-Content of online (0.80), and Support materials (0.80).

Factor 3: Content of the response

This factor has only one high loading variable: Content of the responses from the facilitators (0.84).
The three factors are retained and these factors are used for further analysis with the performances of the participants of ACT-Online programme.

Relation between satisfaction and performance

Overall analysis reveals that participants were satisfied with items belong to Factor 1. The findings reveal that providing basic information in time on website, smooth arrangement for interaction among facilitator and participants and peer to peer interaction as well are important variables or components of online training which keep the participants relaxed and satisfied. However, there is no direct relation between these variables and performances of the participants.

Factor 2: e-Content of online training

Majority of the ACT-Online participants irrespective of their improvement in performances were satisfied with e-content available for the training programme.
It is also noted that the sub-group 3 and 4 have shown better improvement in performances, their performances may have a relation with the use of support materials and level of satisfaction.

Factor 3: Content of the responses from facilitators

Majority of ACT-Online participants irrespective of their improvement in performances were satisfied with the content of the responses from facilitators through e-mail/telephone. Furthermore, the sub-group 4 (the participants with highest improvement in performances after training) expressed most satisfaction.

Overall satisfaction expressed by participants in various sub-groups

The overall satisfaction on ACT-online was examined, keeping the overall experience on the online training programme. Around **72.97%** of sub-group 1, (35.14% satisfied and 37.84% strongly satisfied) **83.33%** of sub-group 2, (65 % satisfied and 18.33% strongly satisfied) **84.09%** of sub-group 3, (47.73% satisfied and 36.36% strongly satisfied) **86.21%** of sub-group 4 (58.62% satisfied and 27.59% strongly satisfied) expressed overall satisfaction. The overall satisfaction expressed by the participants is related positively with improvement in performances. The sub-group 1 with lowest improvement in scores after training has expressed lowest satisfaction (72.97%), whilst the sub-group 2, 3 & 4 showed gradually higher satisfaction, the sub-group 4 having the highest level of satisfaction (86.21%).

Table-2: Shows overall satisfaction expressed by participants in various sub-groups

Responses	Sub-Group 1	Sub-Group 2	Sub-Group 3	Sub-Group 4
Strongly satisfied	**37.84**	**18.33**	**36.36**	**27.59**
Satisfied	**35.14**	**65.00**	**47.73**	**58.62**
Undecided	5.41	1.67	0.00	0.00
Dissatisfied	8.11	6.67	9.09	10.34
Strongly dissatisfied	13.51	8.33	6.82	3.45

Analysis of Attitude towards Online Training

While identifying a set of characteristics, attitude of the participants towards online training has been considered. The objective was to study whether positive attitude could lead to successful completion of the online training programme. A 22 item questionnaire on attitude towards e-learning developed by Mishra and Panda (2007) was administered through online to 722 participants of ACT-Online training programme for this study. The total number of respondents for this questionnaire who completed the questionnaire is 456 (63.14%). Their responses have been considered for final analysis.

There are two factors derived from factor analysis and are named as **factor 1: Advantage of e-learning** and **factor 2: Comparison of e-learning with other forms of learning.**

Factor 1: Advantages of e-learning

In factor 1, 9 items or variables have shown higher loadings. All the variables indicate advantages of e-learning, as expressed by the participants. So, we can name the factor as 'Advantage of e-learning'. The respondents feel that e-learning can increase flexibility in teaching learning, quality, access to education and training; can save time effort for both teachers and learners; can solve many of our educational problems; enables collaborative learning; can bring new opportunities for organizing teaching and learning. They also feel that open universities should adopt more and more e-learning for their learners as e-learning has unlimited possibilities.

Factor 2: Comparison of e-learning with other forms of learning

In factor 2, only 2 variables have shown higher loadings. The variables indicate comparison between e-learning and other forms of learning. The participants felt that e-learning will never replace other forms of teaching and learning, and e-learning experiences cannot be equated with those of face-to-face teaching-learning.

Correlation between attitude and performance

The correlation between factors with performance have been analysed. There is a negative correlation between attitude score and improved performance score which is statistically insignificant. It implies that the two factors of attitude towards online training is independent to the performance score of the participants.

The trends of responses towards e-learning taking each item of the attitude scale were examined with the performance of the participants in each sub-group. No specific trend was noted.
It is concluded that the participants' improved performance after the training is not related to their attitude towards online training.

Analysis of Learning Styles of the participants

Grasha-Riechmann Student Learning Style Scale (Grasha, 1996) was administered through online to 722 participants of ACT-Online training programme. Altogether, 456 (63.15%) participants responded to this scale and returned the filled-in scale within the given time period.
Using SPSS, k-mean method, cluster analysis was done for 456 respondents. Following the learning style range, variables are classified into groups (clusters). Those are relatively homogeneous within themselves and heterogeneous between each other, on the basis of a defined set of variables. There are 4 clusters extracted using the k-mean method.
Further the values of the results are represented in learning style range along with clusters in the Table 3.

Table-3: shows learning style range along with clusters, number and percentage of respondents in each cluster

Cluster	Low	Moderate	High	No of respondents	Percentage
1	Independent, Collaborative, Dependent, Participant	-------	Avoidant, Competitive	92	20.18
2	Independent, Collaborative, Dependent, Participant	Competitive	Avoidant	99	21.70
3	Independent, Collaborative, Dependent, Competitive, Participant	-------	Avoidant	205	44.96
4	--------	Avoidant, Dependent	Collaborative , Participant, Independent, Competitive	44	9.65

The analysis reveals that learning style 'avoidant' and 'competitive' fall under high range in cluster1. Whereas, learning style 'avoidant' falls under high range and 'competitive' under moderate range in cluster 2. Similarly, learning style 'avoidant' falls under high range in cluster 3. Interestingly, learning style 'collaborative', 'participant', 'independent' and 'competitive' fall under high range in cluster 4. Whilst, learning style 'avoidant' and 'dependent' fall under moderate range. Further analysis shows that highest percentage of respondents (44.96%) belong to cluster 3, and 21.70% belong to cluster 2, next 20.18% belong to cluster 1 and lastly 9.65% belong to cluster 4.

Nature of relation between learning style and performance

Since the data on the performance are continuous in nature, the average improved performance against each cluster was calculated. The analysis reveals that participants with avoidant and competitive learning styles have 19.38% average improved score (performance) and participants with avoidant learning style have almost similar average improved score (19.78%). The participants with

collaborative, participant, independent and competitive learning styles have around 18% average improved score after the training (Table 4).

Table-4: shows the percent of participants in each cluster and average improved score

Cluster	Respondents (%)	Score
Avoidant/Competitive	44%	19.38
Avoidant	45%	19.78
participant/Collaborative/Independent, competitive	6%	17.83

It is noted that the maximum percentage of participants in all the sub-groups have avoidant learning style (cluster 3), followed by avoidant (cluster 2) and avoidant and competitive learning style (cluster 1).

In sum, participants of online training programme grouped into four clusters of learning style. (cluster 1: Avoidant/Competitive; cluster 2: Avoidant; cluster 3: Avoidant/Competitive (moderate); and cluster 4: Collaborative, Participant, Independent, Competitive). The findings suggest that majority of the respondents possess 'avoidant' learning style followed by 'competitive' learning style. Further analysis showed that participants with avoidant learning style performed well in ACT-Online training programme and have obtained better improved score after the training followed by participants with avoidant and competitive learning style.

Factors work as barriers to online training

To achieve an important objective of the present study, data were collected from the drop out participants of online training programme using a 16 item questionnaire. Out of 266 participants 200 responded to the questionnaire.

There are two factors derived from factor analysis and are named **as factor 1: personal and factor 2: Organisational.**

Factor 1: personal

In factor 1, 7 variables have shown higher loadings. All the variables indicate personal barrier, as expressed by the respondents. So, we can name the factor as 'Personal'. The respondents expressed that they have not prepared for online training, cannot reasonably arrange learning time and tasks, lack of management skills, cannot adopt the collaborative learning, course contents do not meet the learning needs, and courses too difficult to carry on. They also feel that they have fear of failure as e-learning is new to them.

Factor 2: Organisational

In factor 2, only 3 variables have shown higher loading. The variables indicate barriers towards organisational aspects. The respondents expressed that they were not fully satisfied with feedback on assignments, guidance and support received.

Suggestions and Recommendations

Most of the trainees (around 74 %) mentioned that they have enjoyed the online training environment and the ACT online training programme as a whole. They have developed the concept of open and distance learning, the techniques of assignment evaluation and writing tutor comments, techniques of counselling and providing better support services to the distance learners.

However, participants have provided suggestions for further improvement in the ACT Online training programme. Some important suggestions are as follows:

- More interaction amongst peers and between peer and mentor using synchronous interactivity like virtual class using adobe connect or Skype.
- Advanced training for specific topics like writing tutor comments, organizing and conducting academic counselling sessions and so on.
- Interactive learning e-content may be developed.

Some of the suggestions provided by the experts are as follows:

- Learning style of the participants should be taken care of while planning the programme delivery.
- Social media can be incorporated in the design of the programme.
- Diverse instructional strategies may be followed.
- Flipped class room can be used.
- E-content and e-book should be available for the participants.
- OER can be used.
- Interactive multimedia facility can be utilized.
- E-portfolio facility can be availed for evaluation.
- Peer assessment may be incorporated.
- Group discussion is an important activity which can be included as an assessment component.
- Task based evaluation can be planned.
- Mobile Apps like WhatsApp can be used for interaction.
- Audio and video conferencing can be incorporated for interaction.
- Assessment rubric should be built in the activities.
- Immediate feedback to the participants is must.
- Frequent message to be sent to the passive participants.
- Post training follow up should be built-in.
- Need frequent updation of software and online environment.

  Based on the suggestions received from the participants and experts and observation by the researcher, the following framework for modified online training environment has been recommended:

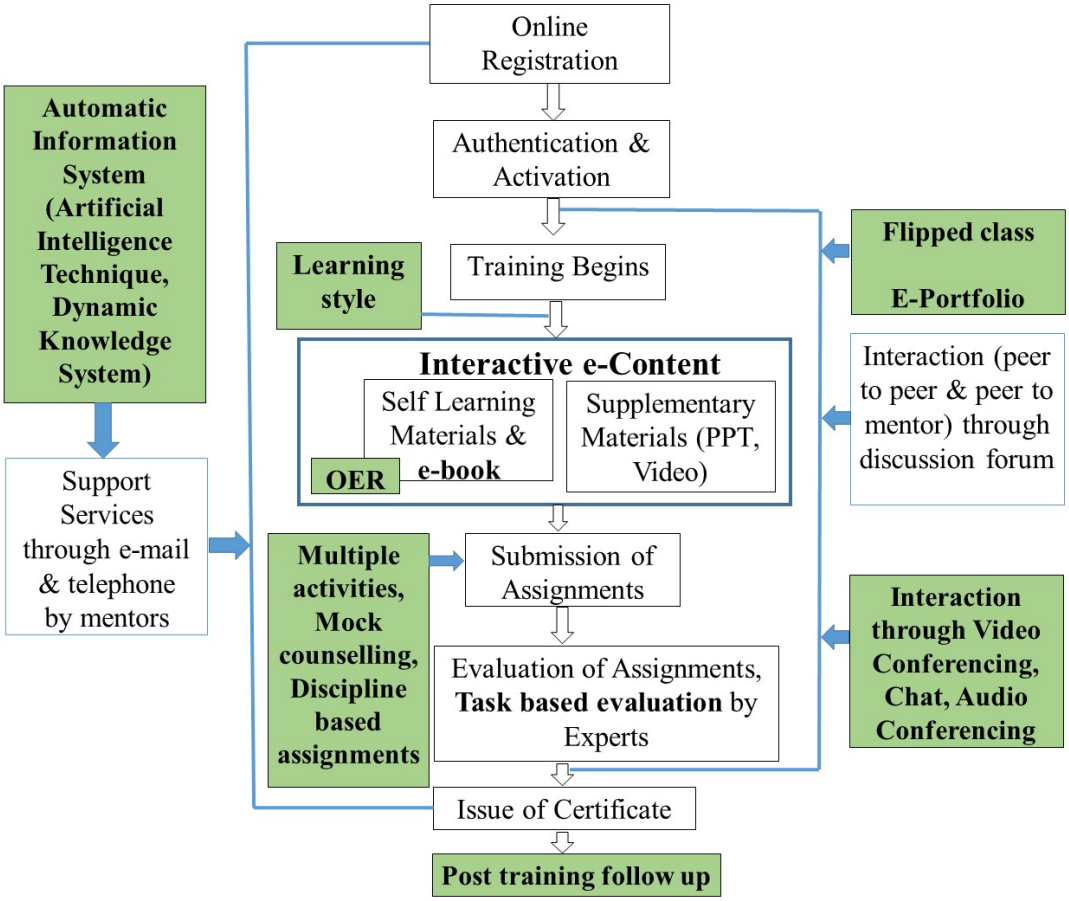

Figure-3: Framework for modified online training environment

The significant features of the modified model are the followings:

- Use of interactive e-content and e-book, automatic information system including Artificial Intelligence (AI) technique and dynamic knowledge system, adaptive hyperlink, synchronous interactivity including virtual conferences, audio conferences, chat, multiple activities (mock counselling, discipline based assignments), OER, mobile apps, e-portfolio, assessment rubric, flipped class room and so on.

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