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# *Defining a conducive e-learning environment*

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# Introduction

- E-learning programmes do experience high drop out rate:
  - in some cases up to 80%
  - eight out of 11 learners prefer classroom-based instruction (Laine, 2003; Frankola, 2001).
  - The adoption of e-learning in many universities has been low

# Introduction

- E-learning is expected to grow by 35% over the next five years and E-learning is expected to reach US\$10 billion by 2012 (Adkins, 2007).
- An overwhelming 93.5% of employees, from various organisations, interview stated explicitly that they enjoyed e-learning (Woodil, 2005).

# Introduction

- Different reports seem to give different picture of e-learning
- There are many success and failure stories
- A conducive e-learning environment can promote better performance among students (Bereiter & Scardamalia, 1989)
- E-learning environment play a vital role in the success of an e-learning initiative

# Conducive E-Learning Environment

- Vaughan and MacVicar (2004) indicated that e-learning will fail if the focus is not on the learners.
- Understanding the needs and readiness of users is paramount to the success of any e-learning programme.
- Very often in e-learning, it is assumed that learners and instructors are familiar with these technologies.
- If learners are not familiar with the technologies, it may have a negative impact on the learning process.
- There are many types of e-learning technologies. Can we identify those technologies favoured or preferred by learners?

# Investigation

- Some 25 key features of LMS were investigated
- 897 survey forms were distributed.
  - 186 of these forms were incomplete and were not used in the analysis.
  - 711 cases were used in the analysis.

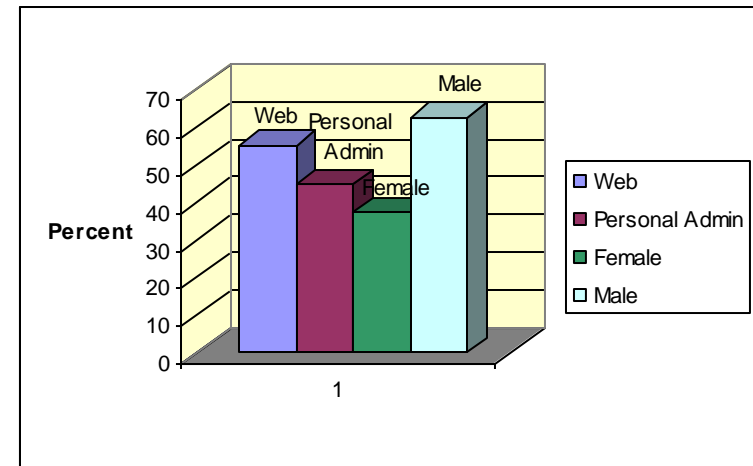
# Demography

	Frequency	Percent
Internet	393	55.3
Personally administered	318	44.7
Total	711	100.0

**Table 4-1: No of cases collected via Internet and personally administered method**

	Frequency	Percent
Female	266	37.4
Male	445	62.6
Total	711	100.0

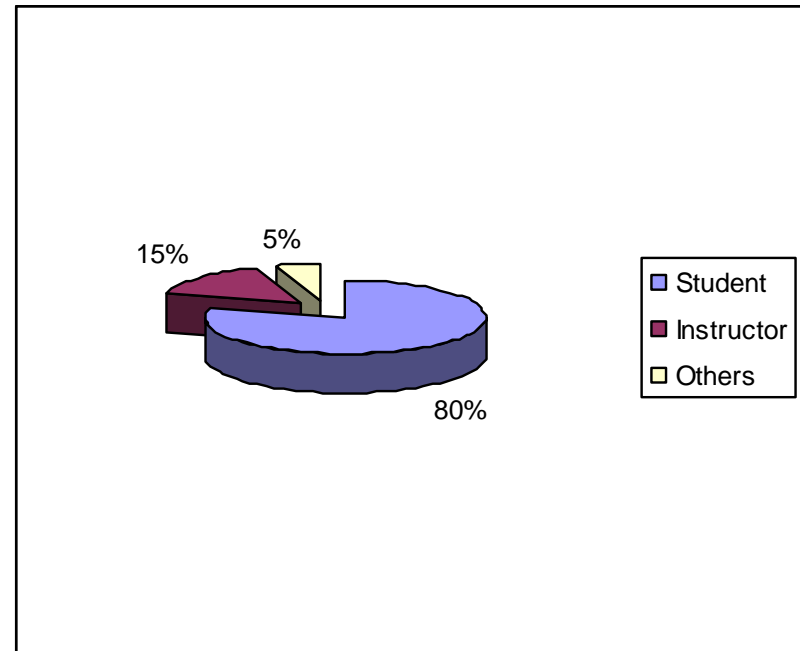
**Table 4-2: Distribution by Gender**



# Demography

	Frequency	Percent
Student	565	79.5
Instructor	109	15.3
Others	37	5.2
Total	711	100.0

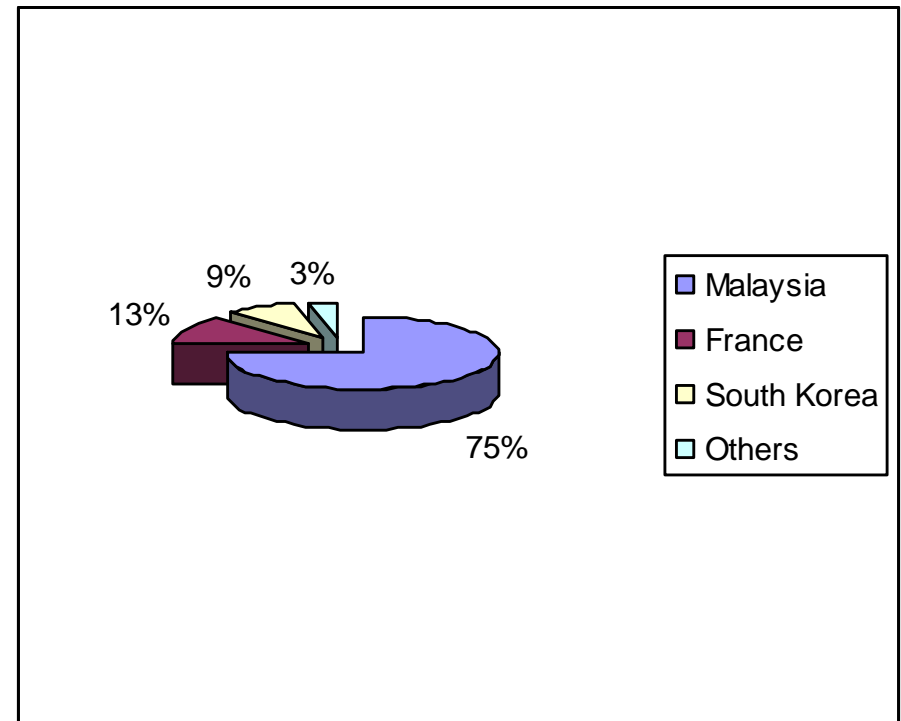
Table 4-3: Distribution by profession



# Demography

	Frequency	Percent
Malaysia	537	75.5
France	89	12.5
South Korea	62	8.7
Others	23	3.2
Total	711	100.0

**Table 4-5: Re-categorisation of the countries**



# Preferred mode of learning

Ref.	Items Investigated
B1	Preference for Classroom Mode
B2	Preference for Printed Materials
B3	Preference for online activities
B4	Adequate Computer and ICT skills
B5	Online more challenging?
B6	Online provides better Understanding?
B7	Online improves motivation?
B8	Online provides better Retention?

# Summary of responses for B1-B8 (Student)

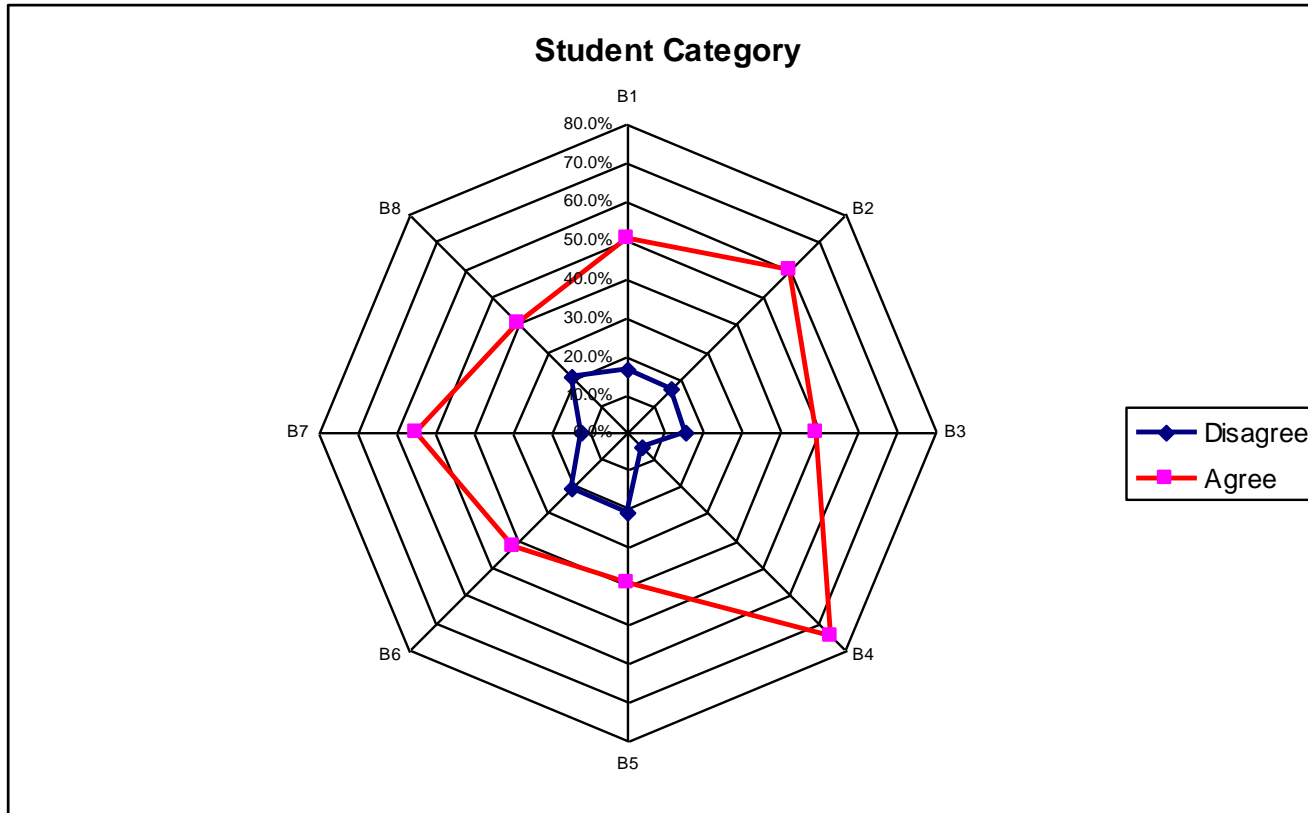


Figure 4-11: Summary of responses for B1-B8 (Student)

# Summary of responses for B1-B8 (Instructor)

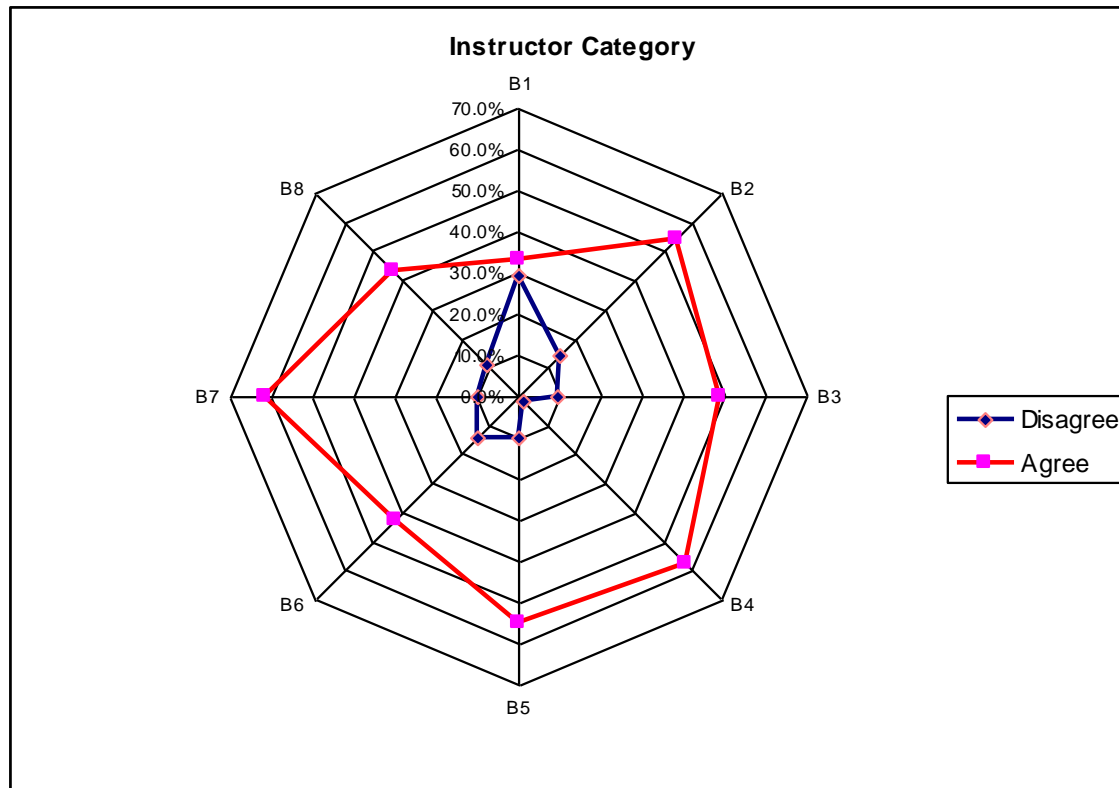


Figure 4-12: Summary of responses for B1-B8 (Instructor)

# Components Extracted through Factor Analysis

	Component	
	1	2
B1		.790
B2		.819
B3	.667	
B4	.539	
B5	.539	
B6	.792	
B7	.792	
B8	.771	

**1= Traditional Approach (TA)**  
**2= Online Activities (OA)**

Table 4-15: Extraction Method: PCA for TA and OA  
 Rotation Method: Promax with Kaiser Normalisation

# Analysis of Traditional Approach (TA) and Online Activities (OA)

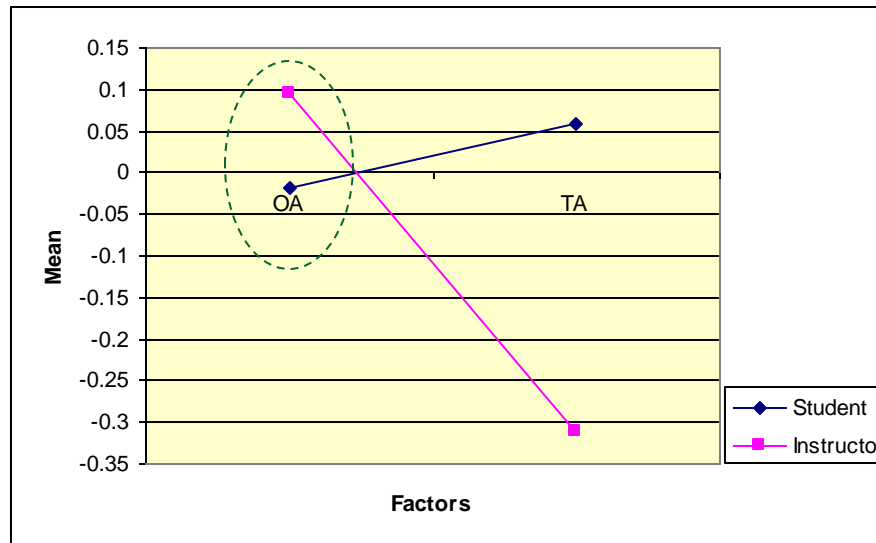


Figure 4 - 5: Results of analysis of TA and OA by Profession

# User Readiness for e-learning

- The following items were used to analyse the user readiness for e-learning:
  - **Connectivity:** Percentage of users who have access to the technology, that is, Internet and Computers
  - **Capability:** Percentage of user have adequate skills and knowledge on computers and applications
  - **Culture:** Culture of users in terms of usage of the system. Number of hours users spend per week on Internet/Computers and Number of key features of the LMS used by the users.
  - **Content:** Are there sufficient content available?

# E-learning Readiness

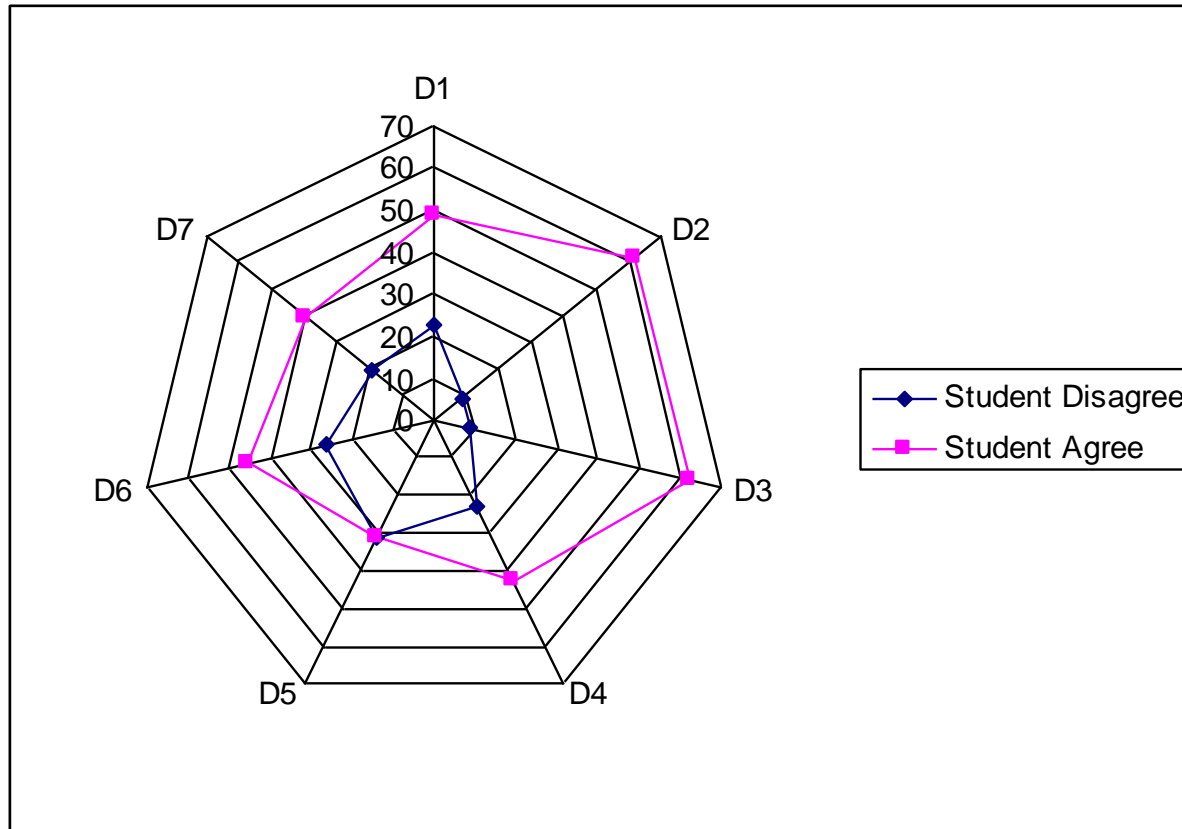
Items		Percentage
(a)	<b>Connectivity:</b> Access to Internet and Computer facilities	94.8%
(b)	<b>Capability:</b>	
	Knowledge and ICT Skills	72.3%
(c)	<b>Culture:</b> (i) Computer and Internet usage level (more than 5 hours per week) (ii) Have used at least 20% or more features of in the LMS	81.1% 95%
(d)	<b>Content:</b>	31.9%
	<b>Average:</b>	71.8%

## Summary on e-learning readiness

# General feedback on e-learning environment

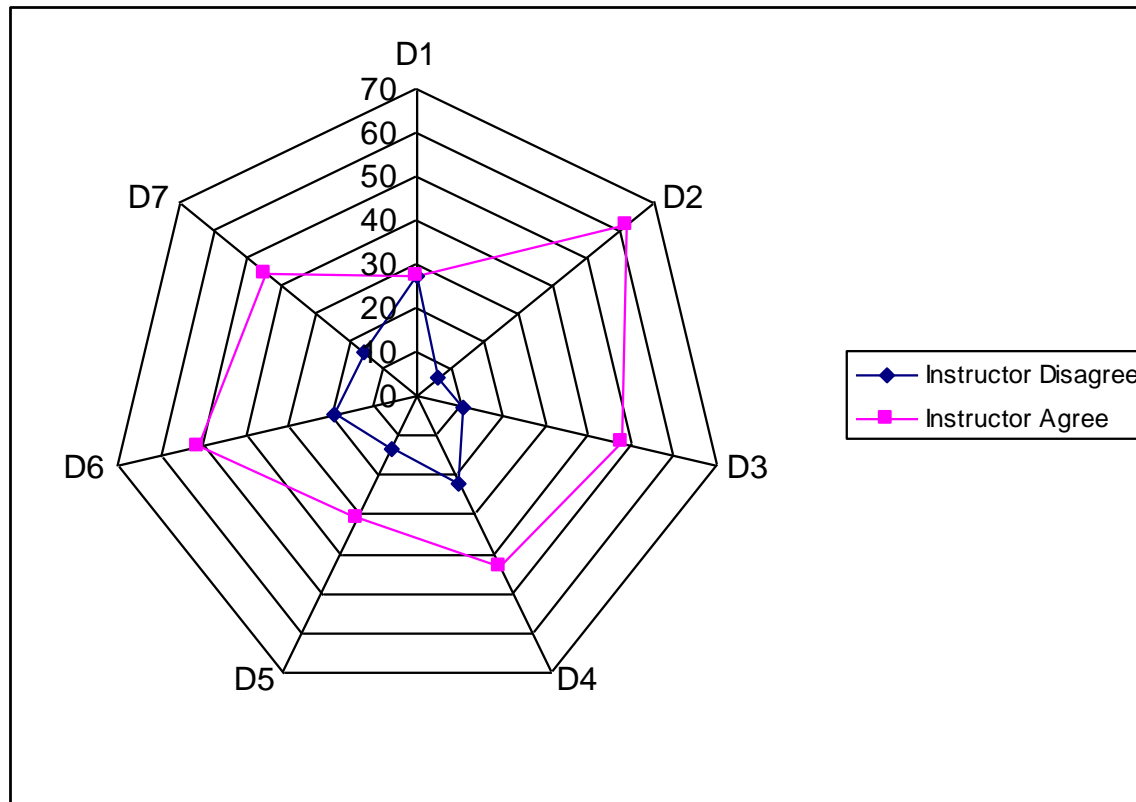
Reference No.	Question	Issue investigated
D1	You use the e-learning system regularly?	Usage level
D2	The e-learning system was beneficial to your studies or work	Usefulness
D3	It was easy to learn to use the e-learning system	User-friendliness
D4	The response time of the system was fast	Response Time
D5	There was enough educational materials on the e-learning system	Availability of online materials
D6	All academic collaboration (announcement, discussions, etc) are done through the e-learning system	Academic Collaboration (via e-learning system)
D7	I like the interface of the e-learning system	Interface design

# Student responses for D1-D7



**Figure 4-16: Responses for Questions D1-D7 (Students)**

# Instructor responses for D1-D7



**Figure 4-17: Responses for Questions D1-D7 (Instructors)**

# Results of Factor Analysis

	Component	
	1	2
D1		.789
D2		.781
D3		.697
D4	.624	
D5	.717	
D6	.717	
D7	.705	

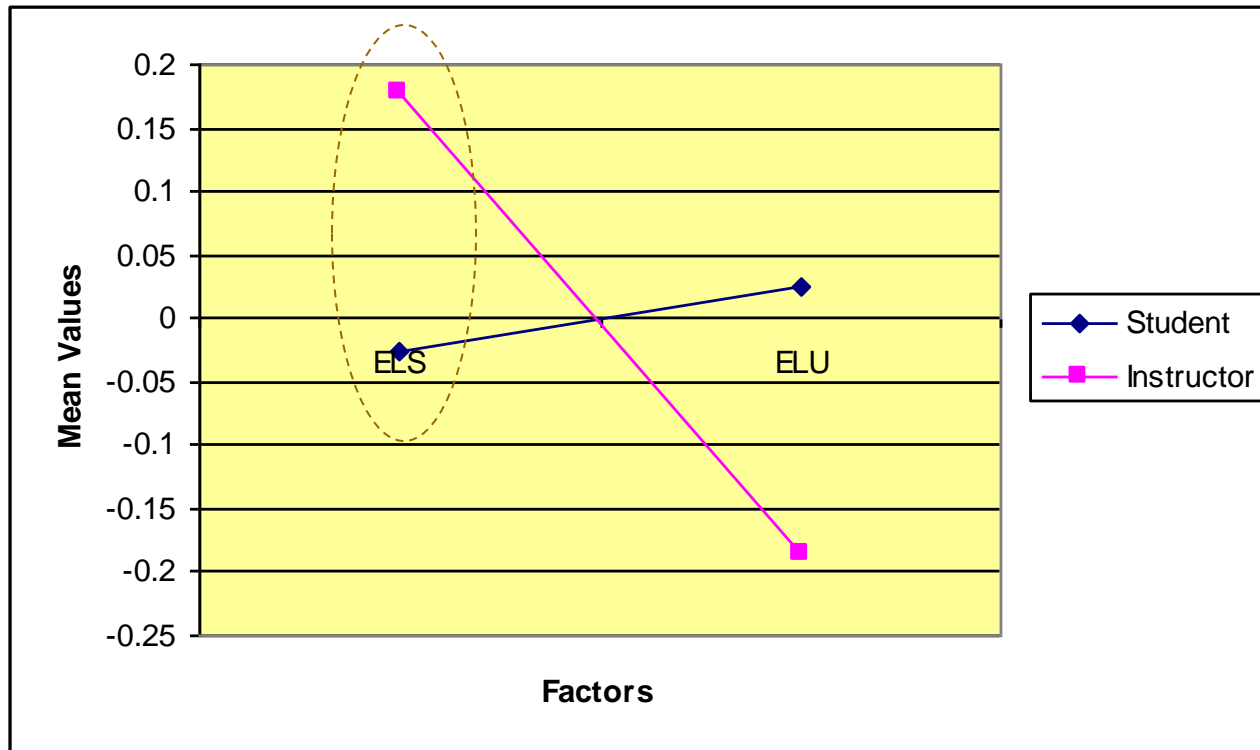
**Table 4-40: Factors Extracted using PCA  
(Rotation: Promax with Kaiser Normalisation)**

Component	1	2
1	1.000	.335
2	.335	1.000

**Table 4-41: Correlation matrix for e-learning usage and system  
(Extraction Method: Principal Component Analysis. Rotation: Promax)**

1= E-Learning System (ELS)  
2= E-learning Usage (ELU)

# Comparison of ELS and ELU by Profession



**Figure 4-13: Mean values for ELS and ELU by Profession**

# E-Learning Technology

- E-learning systems are generally viewed as advanced tools that assist teachers to create a cooperative, multidisciplinary and explorative learning environment (Andreica, 2007).
- There are many tools available for e-learning.
- It is important to understand which tools are useful to the students, instructors and other users.

# Analysis of e-learning Technologies

<b>Items</b>	<b>Description</b>
E1	Online Text-based materials
E2	Online Multimedia Materials
E3	Online Discussion Board/Forums
E4	Online Chat facilities
E5	Online Assignments/tutorials submission and feedback
E6	Notification or Reminders from the system
E7	Online Quiz/Assessment Modules
E8	E-mail facilities and tracking
E9	Calendar ( appointment, events, reminders, etc)
E10	Good Navigation Interface
E11	Various reports (e.g. marks analysis, percentile, course statistic, hit, etc)
E12	Helpdesk (e.g. technical support)
E13	Announcements/Bulletin that can be used by lecturers/students
E14	Auto-selection of appropriate materials by the system
E15	Good Response time of the server.
E16	Security
E17	Resource centre or Digital Library
E18	Administrative features (e.g. registration, forget password, etc)
E19	Course Information, syllabus, catalog, price, etc
E20	Bookmark and Learning History
E21	Whiteboard
E22	Web-based Video Conferencing
E23	Online File Sharing
E24	Glossary
E25	Search facilities

# Analysis on e-learning technologies

- A total of 25 different features of the LMS were selected for this study
- These key features were selected based on a study of the common features available in some popular LMS.
- Among the LMS that were studied includes Blackboard, WebCT, eTutor, Moodle and the MMLS

# Students' preferences towards e-learning tools

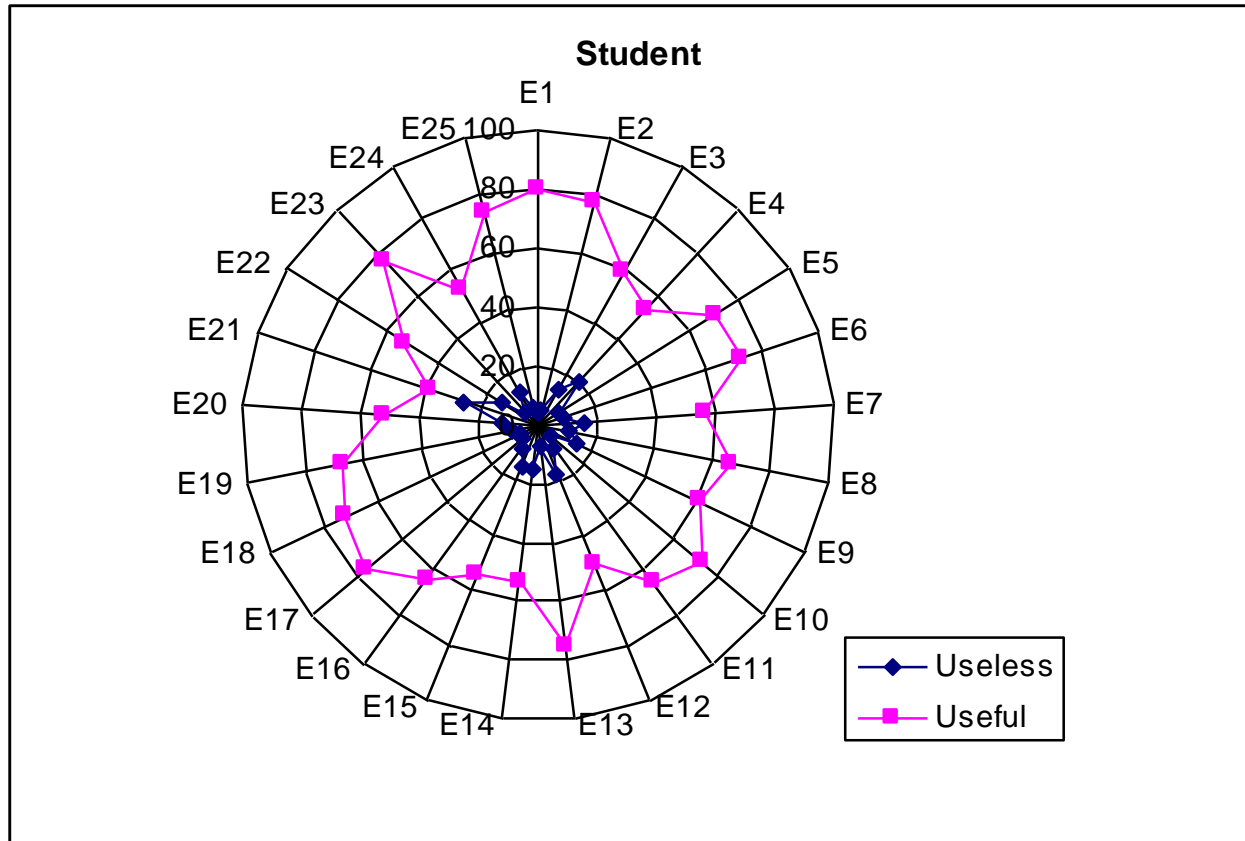
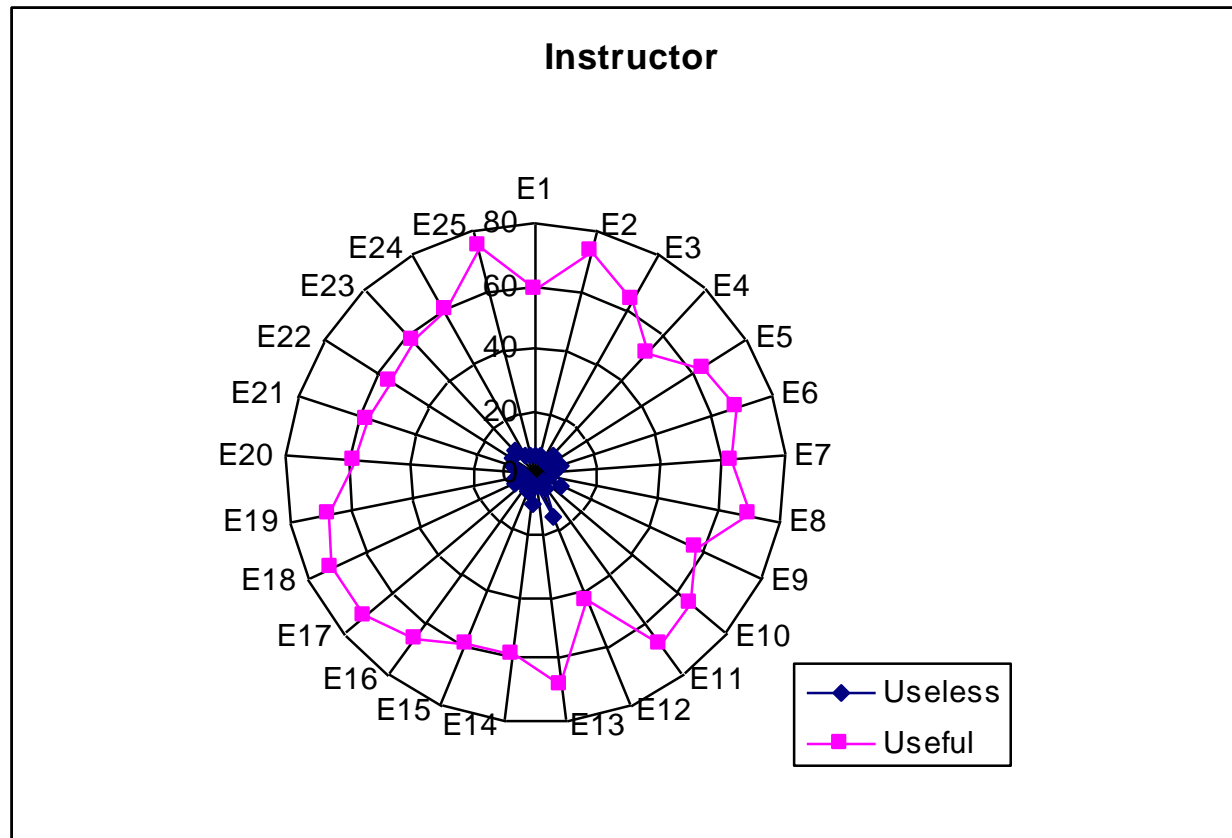


Figure 4-18: Analysis on e-learning technologies (Student)

# Instructors' preferences towards e-learning tools



**Figure 4-19: Analysis on e-learning technologies (Instructor)**

## Four Components Extracted

The four factors:

- Fundamental Technology (FT)
- Support Technology (ST)
- Collaborative Technology (CT)
- Digital Content (DC).

	1	2	3	4
E1				.794
E2				.716
E3			.732	
E4			.722	
E5				
E6		.686		
E7		.571		
E8		.593		
E9		.562		
E10				
E11		.501		
E12		.531		
E13		.585		
E14		.629		
E15	.593			
E16	.688			
E17	.693			
E18	.704			
E19	.587			
E20	.518			
E21			.512	
E22			.644	
E23			.512	
E24				
E25	.569			

**Table 4-57: Factors Extracted**

# Factor 1: Fundamental Technology (FT)

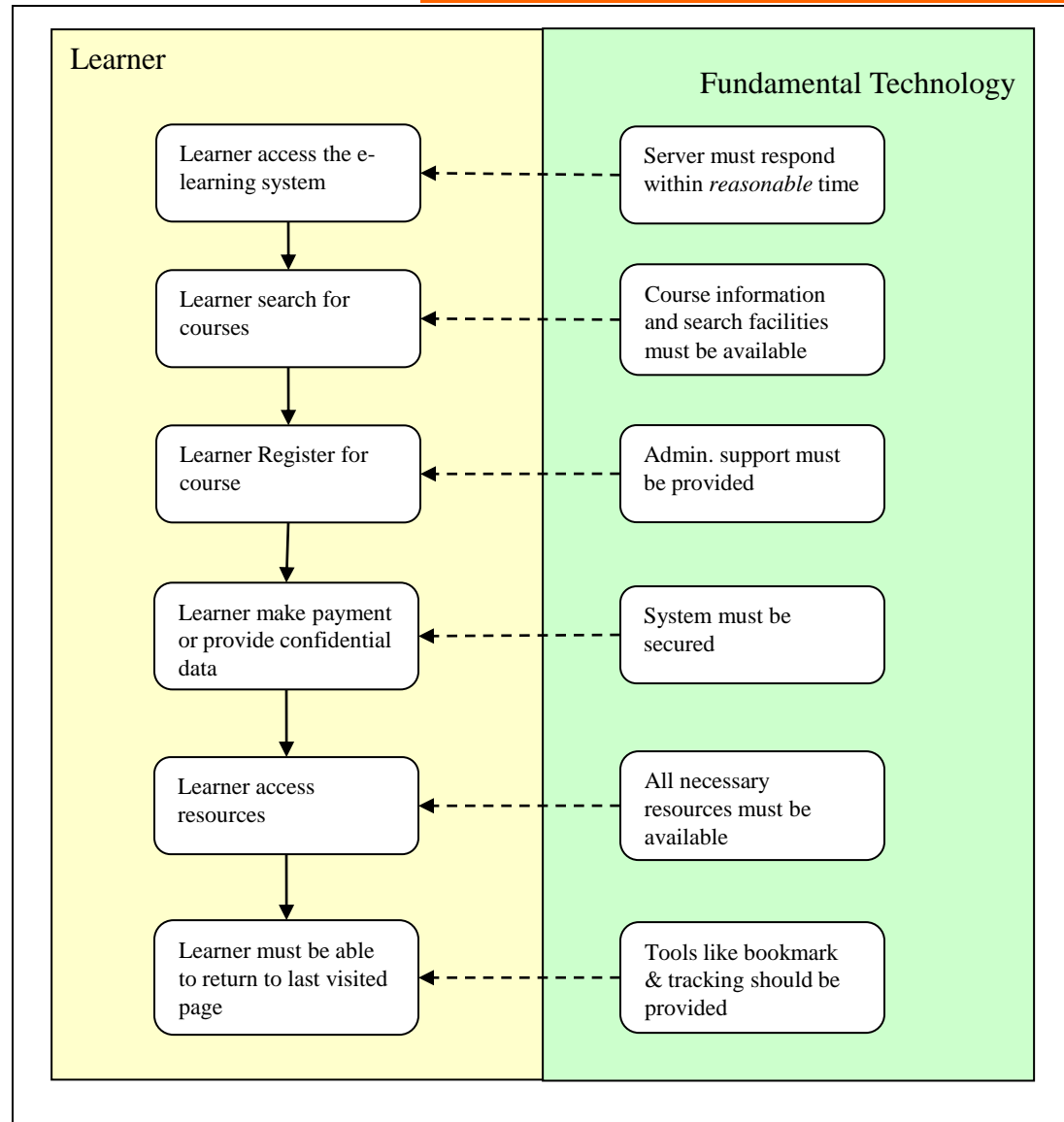
<b>Factor 1: Fundamental Technology</b>	
E15	Good Response time of the server.
E16	Secured /Security
E17	Resource centre or Digital Library
E18	Administrative features (e.g. registration, forget password, etc) - Integration.
E19	Course Information, syllabus, catalog, price, etc
E20	Bookmark and Learning History
E25	Search facilities

**Table 4-59: Factor 1: Fundamental Technology (FT)**

# Fundamental Technology (FT)

- There are seven items grouped into this factor
- FT is the first level of technologies that will be needed by learners
- A walkthrough will be done to show the process a learner would go through when he/she first access an e-learning environment.

# Analysis of FT



**Figure 4-18: The process a learner goes through when initially accesses the e-learning environment.**

# Factor 2: Support Technology (ST)

<b>Factor 2: Support Technology for e-learning</b>	
E6	Notification or Reminders from the system
E7	Online Quiz/Assessment Modules
E8	E-mail facilities and tracking
E9	Calendar ( appointment, events, reminders, etc)
E11	Various reports (e.g. marks analysis, percentile, performance, course statistic, hit rate, etc)
E12	Helpdesk (e.g. technical support)
E13	Announcements/Bulletin that can be used by lecturers/students
E14	Auto-selection of appropriate materials by the system

# Support Technology (ST)

- ST refer to some of the basic tools needed to support the core processes within an e-learning environment.
- Among the support tools that are needed include notifications and reminders, online quiz facilities, email facilities, calendar, reports, announcement and bulletin board and auto-selection of materials.
- E-mail and announcement/bulletin were categories into ST factor rather than CT factor.
- The reason for this is that e-mail is widely used by the students and instructors for various purposes not just for learning purpose
- Helpdesk and support is another key feature that is often overlooked.
- In an e-learning environment, learners are faced with many challenges that are not faced by classroom-based learners

# Factor 3: Collaborative Technology (CT)

<b>Factor 3: Collaborative Technology</b>	
E3	Online Discussion Board/Forums
E4	Online Chat facilities
E21	Whiteboard
E22	Web-based Video Conferencing
E23	Online File Sharing

## Factor 3: Collaborative Technology (CT)

- Cognitivism and Constructivism emphasizes the important collaborative learning and that learning is a social process.
- collaborative learning can be used to create virtual class where a group of remote learners can learn together.
- Research has shown that collaborative learning leads to better student involvement, better performance and higher participation and productivity than individual learning (Nunamaker et al., 1996; Alavi, 1994).
- Learners can also be exposed to different views in collaborative learning (Glaser and Bassok, 1989).
- Collaborative learning also improves the performance of higher intellectual activities (Vygotsky, 1978)

## Factor 4: Digital Content (DC)

- Content is king. Without content there is no learning.
- Research has also shown that many e-learning systems do not provide sufficient content (Kohsaka et al., 1999).
- Many instructors upload the PowerPoint® slides which are designed for classroom-based instruction.
- These classroom-based PowerPoint® slides lack pedagogical goals and proper instructions.
- Learners who go through these slides will not have a good understanding of the subject matter.
- Using multimedia can improve presentation and it can be more engaging to learners.

# Analysis of the factors – Profession (t-test)

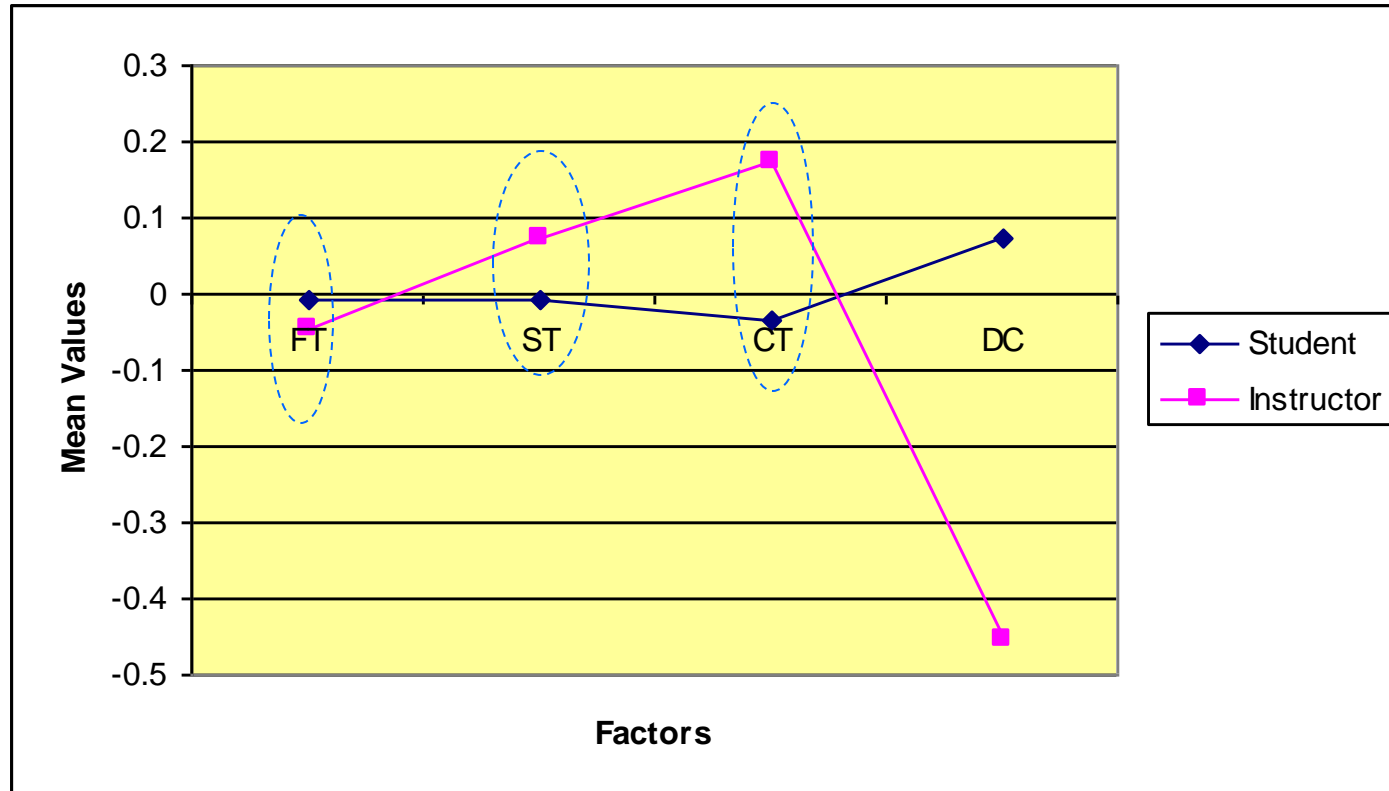


Figure 4-21: Mean Factor Score Values by Profession

# Conclusion

- Learners as well as instructors prefer both the Traditional Approach and Online Activities
- The students of tertiary level educational institutions are ready for e-learning
- Four groups of technologies were identified:
  - Fundamental Technology
  - Support Technology
  - Collaborative Technology
  - Digital Content

# Conclusion: Defining conducive e-learning environment

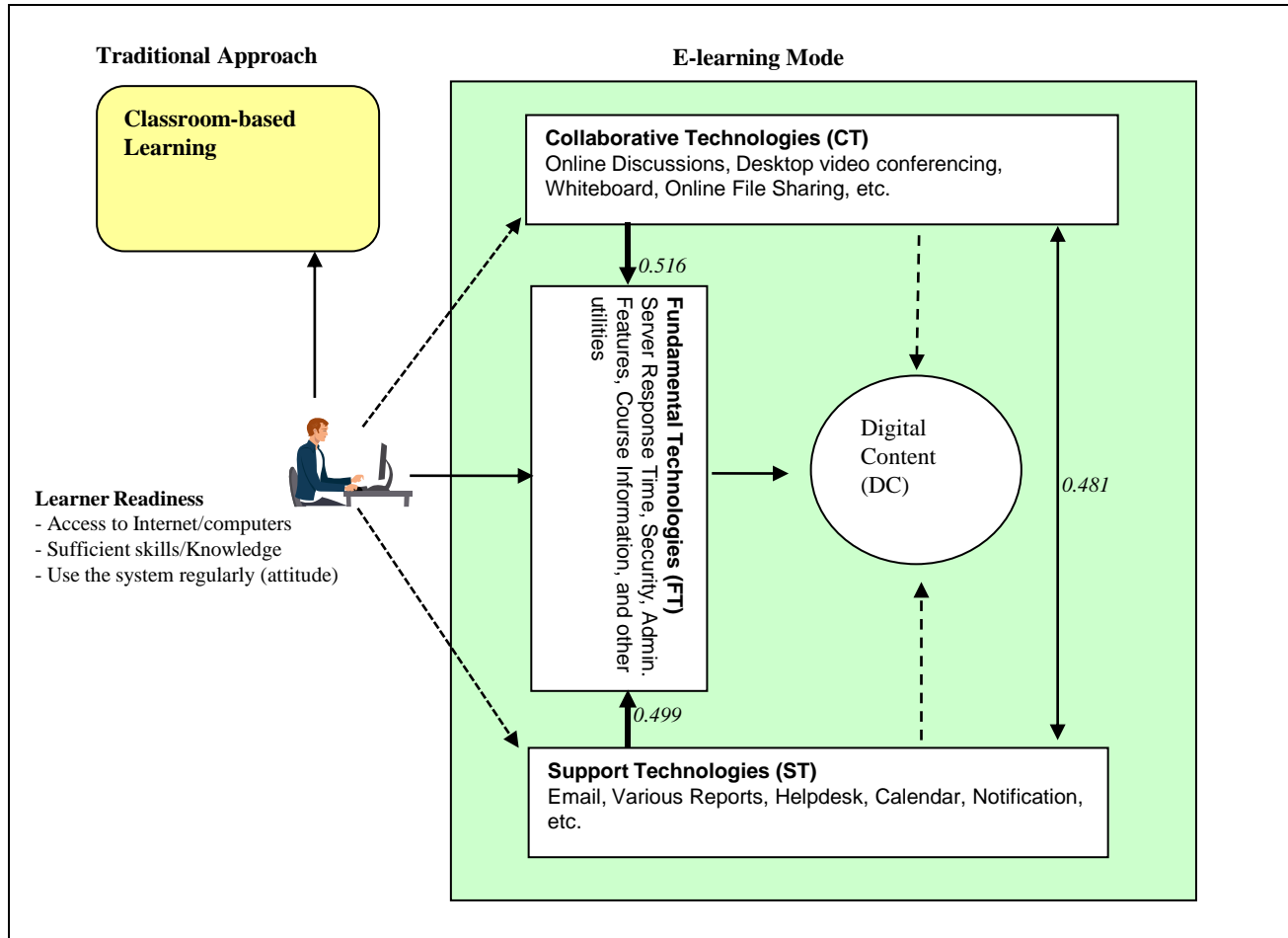


Figure 6-1: Defining a conducive e-learning environment

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Thank you