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Knowledge Management in E-Learning

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Chapter – 3

Knowledge Management in E-Learning

"Tell me, and I'll forget. Show me, and I may remember. Involve me, and I'll understand"

Chinese Proverb

"Neglect of task design tends to have two consequences – either students flounder around unproductively and unhappily, not knowing what is expected of them, or tutors find themselves spending much more time than they can afford trying to animate online discussions"

Goodyear

"Someday, in the distant future, our grandchildren's grandchildren will develop a new equivalent of our classrooms. They will spend many hours in front of boxes with fires glowing within. May they have the wisdom to know the difference between light and knowledge.”

Plato

3.1 Introduction

E-learning can be defined as a learning process which is a combination of digitally delivered content along with learning support services\textsuperscript{23}. It involves transfer of skills and knowledge using electronic applications and processes. The processes include web-based learning, collaborative learning, computer-based learning and virtual classrooms. It is a prearranged and interactive approach to educate and appraise the students and employees.

E-Learning provides an environment for learning supported by continuously evolving collaborative process focussed on improving the performance of individual or an organization\textsuperscript{24}. It is a non-linear environment where the learner is able to choose the topic, time and procedure for accessing the information. E-learning is a dynamic process which should be transformed, personalized and customized on demand and just in time to the learner. The learner in E-Learning environment should be able to control the interaction with the information.
E-learning can also be defined as a concept that is more than online learning, educational websites or software which encompasses a wide set of applications and processes using electronic media to deliver education and training. Any learning activity that a user carries out like watching an educational video or using a computer to practice the lessons is a part of e-learning. The general idea of e-learning is to make learning easier and flexible through Internet, Intranet, broadcasting, web casting, television, and DVDs, etc. In the e-learning environment the content and delivery of the content at the right time is of prime importance. E-learning can be real time synchronous learning, asynchronous learning or offline learning using electronically recorded material.

In this real time synchronous e-learning, the transfer of knowledge takes place through the computer connected to the Internet. The learner accesses the learning environment and interacts with the resources like text, audio, video, etc. The tutor or the teacher, with the help of the environment utilities facilitates and supervises the learning process. The communication between the trainer and the learners can be real time or offline through mail, debate, forum, etc. This type of learning environment helps in continuous evaluation of learning process. The traditional classroom teaching is instructor oriented where the knowledge is delivered to the learners by the instructor. The learners who are toppers, outspoken, having good verbal aptitude are the major participants in this environment whereas slow learners lag behind due to various reasons. The technology can be used in traditional classroom but is not central to the learner. The online learning environment is learner oriented where the learner is only guided by the instructor. It is an active learning mode where the learner has to learn at his own pace and has to actively participate in the learning process. The technology helps the learners to explore the learning resources.

The asynchronous form of e-learning makes use of bulletin boards, online discussion groups, e-mail and portals which help in communication between
the instructors and learners. It may also be self contained by providing links to online reference material in place of an instructor.

3.1.1 Benefits of E-learning
E-learning provides several benefits to the learners over classroom teaching. Some of the major benefits of e-learning are listed below:

- **Cost Effective**
  In e-learning authoring software are used which help in asynchronous learning content. One time cost of development of software is involved which reduces to zero cost after reaching the breakeven point. In synchronous e-learning mode the recurring cost is involved with the instructor managing the cost but are much less than the traditional courses.

- **Self-Paced Learning**
  Learners are benefited by the self paced learning characteristics of e-learning. The learners can make use the course content available on the web anywhere at any time. It also provides flexibility to choose the course modules suitable to the candidate as per his wish, interest and requirement.

- **Improves Quality of Education**
  As the learner does not have to run from pillar to post for studying and does not have to rely much on the mood of the instructor, the quality of education improves. The learner can revise as many times as he want by using the e-content.

- **Removes Digital Divide**
  Digital divide describes the social implications of unequal access by some sectors of the community to information and communications technology and to acquisition of necessary skills. The division of world between those who have access to new information and communications technology and
those who do not is termed as digital divide. The learners in the remote areas who are otherwise denied education can also take advantage of e-learning. It enhances the learner’s choice of taking up the courses that are of his/her interest.

**E-Learning Environment:**

- **For Teachers:**
  Is more flexibility in design and delivery as compared to the traditional approach of teaching. The teachers can design the content as per their choice and change as per the pace of learners.

- **Learning Time**
  Reduces time the learners need to learn by providing latest information.

- **For Learners:**
  Increases self motivation, self learning capabilities of learners, consistency in teaching.

- **Easily Managed**
  It is easy to manage the environment of e-learning if the number of students increase. The examination conducting process, managing profile of the students, other details, and result declaration becomes easier in e-learning.

### 3.1.2 Qualities an E-Learning System should have:

The e-Learning system should help the instructors to create and manage course content, utilize world class publisher content, evaluate performance and communicate with students. Some of the most powerful features of e-Learning system are listed below:
Instructions:
The e-Learning System should have capabilities for managing courses and tailoring instructions to fulfil student requirements which include:

- Course Management
- Content Editor
- Custom Learning
- Syllabus Builder
- Learning Units
- Content Reference
- Glossary
- Personal Information Management

Communication:
Communication capabilities allow students and faculty to discuss issues online, to schedule collaborative sessions and to form groups that enable teamwork across geographic boundaries. One can have the following features to improve the communication process:

- Discussion Board
- Group Project
- Virtual Classroom

Assessment:
Assessment capabilities give instructors useful tools to evaluate student learning. These features increase instructor's ability to evaluate student’s performance efficiently. The assessment can be:

- Online Assessment
- Assignment
- Student Progress Indicator
3.2 Review of Literature on e-learning

3.2.1 Learning Theories

While implementing the e-Learning models one should be clear with the underlying assumptions. A model of E-Learning demonstrates on what pedagogical principles the added value of “e” operates; for example, “e” allows remote learners to access the learning content which is an added value to the learning approach. Technology plays an important role in e-learning for bringing the remote learners to a place which gives the ambience of traditional teaching\[46\].

Theories of learning provide empirically based accounts of the variables which influence the learning process and provide explanation of the ways that influence occurs. The task of good pedagogical design is that there are absolutely no inconsistencies among the curriculum we teach, the teaching methods we use, the learning environment we choose and the assessment procedure we adopt\[4\]. We need to map learning theory onto pedagogical approaches for an E-Learning implementation. E-Learning as any other learning methods, is based on assumptions about achieving learning outcomes. Biggs stresses on constructivist pedagogical approach where the focus is always on what the learner is actually doing, placing the learning and teaching activities at the heart of the process. The curriculum design cycle is shown in the Figure 3.1.

Greeno Collins & Rasnik\[15\] have identified three different perspectives about what is crucial for understanding learning:

i) The associative / empiricist perspective (Learning as activity)

ii) The cognitive perspective (Learning as achieving understanding)

iii) The situative perspective (Learning as social practice)
The associative/empiricist perspective states that the knowledge is an organised accumulation of associations and skill components. This theory requires subject matter to be analysed as specific associations, expressed as behavioural objectives. The associative perspective emphasises on task analysis, defining sequences of component-to-composite skills. It provides a highly focused set of objectives, described as learning competencies.

The cognitive concept provides basis for analyzing concepts and procedures of subject matter curricula in terms of information structures, and gave rise to new approaches to pedagogy. The cognitive account observes knowledge acquisition as proceeding from a declarative form to a procedural, compiled form. As performance becomes more expert-like and fluent, so the component skills become automatised. Thus, conscious attention is no longer required to monitor the low-level aspects of performance and cognitive resources are available for more strategic levels of processing. Cognitive approaches to learning have emphasised the assumptions of constructivism that understanding is gained through an active process of creating hypotheses and building new

Figure 3.1 : The Curriculum Design Cycle\cite{46}
forms of understanding through activity\[41\]. The cognitive perspective emphasises on conceptual development, stressing the importance of achieving understanding of the broad unifying principles of a domain. This view also encourages us to frame learning outcomes in meta-cognitive terms, with the educational aim of achieving understanding about how to learn, and encouraging the development of autonomous learners\[46\].

The social perspective on learning has received a major boost from the re-conceptualisation of all learning as ‘situated’. A learner will always be subjected to influences from the social and cultural setting in which the learning occurs, which will also define at least partly the learning outcomes. This view of learning focuses on the way knowledge is distributed socially. When knowledge is seen as situated in the practices of communities, the outcomes of learning involve the abilities of individuals to participate in those practices successfully. The situative perspective encourages the definition of learning objectives in terms of the development of disciplinary practices of discourse and representation\[34\]. It also focuses on learning outcomes that are dependent upon the establishment of collaborative learning outcomes, and on learning relationships with peers. This perspective also encourages us to formulate learning outcomes in terms of authentic practices of formulating and solving realistic problems\[46\].

In our study we have followed the theory of cognitive view as it focuses on interactive environments for construction of understanding, teaching and learning activities that encourage experimentation and the discovery of broad principles, supports for reflection. As per the cognitive view knowledge acquisition is viewed as proceeding from declarative form to a procedural compiled form. Hence the performance becomes expert like and component skills can be automatised. The pedagogy that is derived from cognitive is the constructivist learning environment. It stresses on learning by doing.
The constructivist view of learning can be summarised by the following assertions:

- The learner actively constructs knowledge, through achieving understanding
- Learning depends on what we already know, or what we can already do
- Learning is self-regulated
- Learning is goal-oriented
- Learning is cumulative

Activities of constructivist understanding have two main aspects:

- Interactions with material systems and concepts in the domain.
- Interactions in which learners discuss their developing understanding and competence.

The design principles for constructivist teaching and learning activities (TLA) can be listed as follows:

- **Ownership of the Task**
  The instructor is owner of the task for solving the real world problems and the learner is the owner of the task provided for learning. Feeling ownership is encouraged constructive TLA. The student plays an important role in mediating and controlling learning.

- **Coaching and Modelling of Thinking Skills**
  Instructional goals should be negotiated and not imposed. Problem-solving, high-order thinking skills are emphasized.

- **Scaffolding**
  Scaffolding is a process of guiding the learner from what is presently known to what is to be known. Students problem solving skill falls into three categories viz. skills which the students cannot perform, skills that student may be able to perform, skills that students may perform with
help\textsuperscript{[49]}. Scaffolding is facilitated to help students perform just beyond their limits.

- **Guided Discovery**
  Goals and objectives are derived by the student or in negotiation with the teacher or the system. Knowledge construction and not reproduction is emphasized. It enables context and content dependent knowledge construction. It also supports collaborative construction of knowledge through negotiation.

- **Opportunity for Reflection**
  Reflection is the learning outcome of constructivism. The students must learn to be reflective learners. Reflective learners help to develop thinking, self-awareness and analytical skills which are important for teachers and learners. Opportunity for reflection helps in informing the system about what worked or did not work, what can be done, how the environment can be made better and so on.

- **Ill-Structured Problems**
  Proper designing should be done to tackle the problems whose existing state and the desired state are unclear.

The constructivist view of assessment emphasises:

- Assessment of broad conceptual understanding
- Assessments of extended performance
- Crediting varieties of excellence

The learning outcomes include academic understanding, generic competence, reflection, skill. The outcomes are independent of the various perspectives discussed in the above section.
The key issues in implementing the E-Learning environment include efficiency, effectiveness, costs, quality assurance, tutor/student ratio, staff development, student support, technical support, management support, etc.

3.2.2 E-Learning and Knowledge Management:
E-learning and KM belong to different aspects, but they have a same goal: promote knowledge and learn about. The elements of KM are people, science and technology media and information. E-learning can be defined as the process of learners to make use of ICT to learn to acquire knowledge and apply knowledge, which shows that Knowledge Management is analogous to E-Learning.

E-Learning is the tool with the help of which we can internalize knowledge i.e. transfer explicit knowledge to the learners. The knowledge is acquired by the learners using E-learning systems from the knowledge stored in E-Learning repositories. The knowledge is stored as e-content. E-learning systems help in knowledge sharing with rich knowledge resources. The relationship between E-Learning and Knowledge Management is shown in the Figure 3.2. Knowledge accumulated in the knowledge pool which consists of the knowledge acquired by the learners in the form of their experience helps in Knowledge Innovations.
The Knowledge Pool of the University helps to innovate and improve the E-Learning environment.

3.2.3 Standards and Specifications for Web based E-Learning

Standards and specifications in E-Learning are required for independent assets of learning to coexist for effective and better learning outcomes and support interoperability, scalability, durability, and accessibility. The interoperable objects include content-metadata, packaging, sequencing, learner profiles, and runtime interactions. With the rapidly changing technology, it becomes very difficult to recover the content stored using the older technology. New formats are created with the change in technology which requires tremendous cost and time for content recovery. The searching for an appropriate content for specific learners is also a problem in E-Learning systems. Hence it is highly needed that in order to remove the difficulties stated above a common standard should be used for E-Learning Systems.

Existing standards & specifications in E-Learning include Content Metadata (IEEE LOM 1484.12), Content Packaging & Sequencing (IMS), Question and Testing Interoperability (IMS), Content Structure (AICC), SCORM, Education Modelling Languages\(^{21}\).

Due to remarkable features of SCORM like interoperability, reusability, accessibility, adaptability, affordability, durability we have suggested SCORM for the development of E-Learning systems, SCORM is described in detail.

3.2.3.1 SCORM : Sharable Content Object Reference Model

An initiative of ADL, SCORM uses the standards and specifications of other organizations like IEEE Data Model For Content Object Communications, IEEE ECMA Script Application, Programming Interface for Content to Runtime, Services Communication, IEEE Learning Object Metadata (LOM), IEEE Extensible Markup Language (XML) Schema Binding for Learning
Object metadata Data Model, IMS Content Packaging and IMS Simple Sequencing. It provides a model to create and deploy E-Learning environment having a strong server side content distribution and web as the delivery medium. It provides an API (Application Programming Interface) for learner’s interaction with content object, a defined data model for representing this information, a content packaging specification that enables interoperability of learning content, a standard set of meta-data elements that can be used to describe learning content and a set of sequencing rules. It uses sequencing which is a set of rules that specify the order in which a learner may experience content objects.

**SCORM encapsulates these specifications in three broad categories as follows:**

**i) Content Aggregation Model**

It represents a learning strategy for designers and implementers of instruction to aggregate learning resources for the purpose of delivering a desired learning experience. There are two terms mostly used in Content Aggregation Model: Item and SCO. Example of Items in SCORM is standalone text file, media file etc. SCO are collection items which are treated as a unit for the Learning Management System (LMS).

**ii) Runtime Environment**

It gives details of the requirement for launching content objects, establishing communication between LMSs and SCOs, and managing the tracking information that can be communicated between SCOs and LMSs.

**iii) Sequencing and Navigation**

It is based on the IMS Simple Sequencing (SS) Specification. It also describes how learner and system initiated navigation events can be triggered and processed.
3.2.4 Learning Management Systems: Some Examples

Many e-learning systems are available free online or on payment basis. Some systems are developed using the standards available in the market like IEEE Learning Instructional Management Systems, Instructional Management Systems and Sharable Content Object Reference Model (SCORM).

Some of the examples of Open source Learning Management Systems\[^{17}\] are Moodle, aTutor, Sakai, OLAT, eFront, Canvas by Instructure, Chamilo, Claroline, Dokeos, Fedena, ILIAS, OLAT, Totara LMS, WeBWorK; examples of proprietary systems include Blackboard Learning System, CERTPOINT Systems Inc., Desire2Learn, eCollege, Edmodo, GlobalScholar, Glow (Scottish Schools National Intranet), HotChalk, Informetica, ITWorx CLG (Connected Learning Gateway), JoomlaLMS, Latitude Learning LLC, Meridian Knowledge Solutions, My Big Campus, QuestionMark, Saba Software, SAP, Sclipo, Schoology, SharePointLMS, etc.

3.3. Present Scenario of E-Learning at Sardar Patel University

The e-learning concept at Sardar Patel University is at the stage of infancy. In some of the Departments E-learning takes place at a local level where the students are able to learn through readymade CDs/DVDs to learn the topics of their choice i.e. individualized self-paced learning. There is no Learning Management System which can help the students, teachers and staff to learn online. The main aim of this study is to suggest a framework of a Learning Management System and a model that will help manage the intellectual knowledge of the University. At the end we would project the advantages of having the e-learning environment in the University. This will help the University to implement the Distance Education Programmes and Life Long Learning Programmes. Not only the students but the administrative staff and faculty will also be benefited with the environment. The researcher has studied
various methods to implement the e-learning systems for Knowledge Management such as open source learning management system - Moodle. But it is observed that a model based on Service Oriented Architecture (SOA) is best suited for the University. Before going into details of how this architecture will help in the development of E-learning environment, we describe the basic features of Service Oriented Architecture.

3.4 Introduction to Service Oriented Architecture (SOA):

**Service Oriented:** It defines the method of integrating business applications and methods as linked services.[36]

**Service Oriented Architecture:** It is an architectural style suitable for an enterprise IT architecture that leverages the principles of service orientation to achieve tighter relationship between business needs and IT systems that support those needs. SOA supports the natural way of thinking about the organizations we operate and the world in which we live. The users are concerned only with the services provided and not on the procedures followed for fulfilling the services. In our study we have taken University as the service provider of various services like traditional teaching-learning in general and e-learning in particular. The user invokes a service like registering for an online course. From a business point of view, Service Oriented Architecture defines a set of business services composed to constitute the business design that the enterprise wants to expose internally, as well as to its customers and partners. From an architectural point of view Service Oriented Architecture is an architectural style that supports service orientation. At the implementation stage, Service Oriented Architecture is fulfilled using a standard based infrastructure, programming model, and technologies like web services. At the operational level Service Oriented Architecture includes a set of relationships and agreements between service consumers and providers that specify the quality of service. Service can be any repeatable organizational task like accessing course
content as a registered user from the e-Learning System. It can be made up of sub processes like:

- Enter the Registration Number (Input)
- Select the option (like access course, examination paper, quiz, etc.) (Process)
- Display/Print (as per the user needs) (Output)

This approach is the top-down methodology where the organizational process is identified and then within that process, a set of tasks is performed. This means that the tasks in the process are services and the process is a composition of services. A Service is a reusable component.

- A Service changes data from one state to another
- A Service is the only way how data is accessed
- If you can describe a component in WSDL (Web Services Description Language which is used to describe services), it is a Service

Another way of defining Service Oriented Architecture is: A method of design, deployment, and management of both applications and the software infrastructure where:

- All software is organized into a set of services that are network accessible and executable.
- Service interfaces are based on public standards for interoperability.

**Characteristics of Service Oriented Architecture:**

- Quality of Service (QoS), security and performance are specified.
- Software infrastructure is responsible for management.
- Services are cataloged and discoverable.
- Data are cataloged and discoverable.
- Protocols use only industry standards.
A software design process should result in a design that serves as both an adequate response to the user's requirements and an unambiguous model for the developers who will build actual software. A design therefore serves two purposes: both to guide the developer in the work of building the system and to certify that what will be built will satisfy the user's requirements.

3.5 Framework for Proposed E-Learning System for Managing Intellectual Knowledge at the University using Service Oriented Architecture: SPUeLEARN

SPUeLEARN is a proposed e-learning environment (Figure 3.3) for providing complete e-learning solution. This environment would provide a variety of domain knowledge and e-contents that are developed using Service Oriented Architecture. A proposed user-friendly interface would help the students to learn at their own pace with ease. The SPUeLEARN framework receives the e-content services viz. e-contser1, e-contser2... e-contsern for publishing of the e-content through service registry. These services are described using Web Service Description Language (WSDL)\(^{[27]}\). WSDL is a language that describes Web services. Web Services provide a standard means of interoperating between different software applications, running on a variety of platforms. Each teacher provides e-content as the owner of the e-content services. This e-content is published only after audited by the experts which we call as e-content auditor. The e-content to be published is sent to the concerned experts, audited by them and then sent to the content auditor again which is then returned as the e-content service. The e-content service can be published as well as updated using WSDL to the Registration of Service registry. The service requester supplies discovery criteria to the registry and selects a suitable service description and capabilities. In this way the communication between the SPUeLEARN and e-content service is bound.
The SPUeLEARN consists of three main sub systems namely:

- SPU Knowledge Endeavouring Subsystem (SPUKES)
- SPU Knowledge Supporting Subsystem (SPUKSS)
- SPU Pedagogical Design Subsystem (SPUPDS)

**SPU Knowledge Endeavouring Subsystem (SPUKES)**

The SPUKES is the subsystem of SPUeLEARN which caters to the needs of the students by presenting an environment for personal learning services as well as assessment services. It supports the activities like registration of course, attending the course, searching for the existing knowledge on course ware, preparation, etc. for the students. This subsystem guides the students throughout the session of learning by providing related learning material and recording the status of learning like number of chapters completed. It also provides services like quizzes, exercises for student evaluation.
SPU Knowledge Supporting Subsystem (SPUKSS)

The SPUKSS Subsystem is used to monitor the progress of the students and appropriately instructing them for by suggested better ways to learn the courses. The mentor of the course will look into the progress of the student using SPUKES and help the student to provide the suitable course material as per his status of learning.

SPU Pedagogical Design Subsystem (SPUPDS)

The SPUPDS subsystem is for the teachers and mentors for editing the courses for the students, locating information for the teachers, defining attributes and relationships of e-content to establish a learning module. This module can be transferred to the SPUeLEARN repository to be accessed by the students for e-learning. This system will help the teachers to develop e-content in various formats, send it for approval to the auditor and then publish it to the repository.

Architecture for proposed e-learning system SPUeLEARN

![Architecture for SPUeLEARN](image)

**Figure 3.4 : Architecture for SPUeLEARN**
The e-content may consist of books, teaching material, problem-based reports
and learning lists. Login frequency of students, experience on learning should
be included in learning portfolios. While providing the e-content the teacher
has to clearly define the goals of studying the course. He should also provide
guidance and counselling to the learners.

3.6 Best Practices in Developing E-Learning Environment
in the Universities:
The final E-Learning Environment is the outcome of the analysis, design,
development, implementation and evaluation. The main goal of this kind of
environment is to be provide knowledge to the learners and thereby giving
them chance to innovate the knowledge from the lessons learnt. The University
should follow best practices to provide the state-of-the-art environment to the
learners. Detailed instructional analysis should be carried out to achieve the
best practices like methods for acquiring knowledge or skills to be learned,
clear and measurable learning objectives, strategies that support learning. A
questionnaire should be prepared which covers the points related to learning
experience, which is influenced by a number of the following factors.

- The reason for choosing the ‘e’ environment
- The goal of the content viz. improve skills
- Timeline of the content
- Background knowledge of the learners
- The target learners
- Provider of the content
- Subject matter and desired outcomes
- Learners driving force to take up the course
- Job prospects after completion of the course

Learning objectives are stated at the beginning, which give the outline of the
course content[^13]. has defined ideal learning objectives with SMART (S:
The content presented by the E-Learning environment should be interactive. Interactivity means a “dialogue,” requiring a learner’s response to course stimuli and the course’s feedback to that response. By interacting with the content and making decisions about the information presented, learners become active participants, triggering recall and improving understanding and knowledge retention. Interactivity is an important component of instructional design as it enhances learning. Interactivities include graphics and animation, navigation, audio and video controls, exercise & assessments, discussions and collaborations. Various reasons for providing interactive environment are to explain and support concepts, practice and apply learning, check learners’ understanding to determine if course objectives are met. Interactions can be passive, limited, complex or real time. The type of interactions depend on the courses offered and level of learning.

The learner communicates with the E-Learning environment through the interface. Navigational elements help the learner to move through the course. A well defined interface would help the learner to learn the content in a user-friendly manner.

The content of the E-learning environment consists of text, graphics and interactive tools that provide explanation of concepts and instructions to use the environment. The balanced use of text and graphics makes the content more understandable. The subject matter is provided by the subject experts which in turn is presented by the designers as per the learning objectives. The subject experts may not be experts in using computers. Hence, we propose that they should be trained on development of e-content. Standard format in the form of templates should be provided so as to have uniformity of presentation.
throughout the system. We suggest that the e-content should be presented in the following form:

1. Textual form
2. Audio & Video presentation
3. Supplementary references in the form of guidelines, web links, books
4. Question banks, Assignments, etc.

While designing the E-Learning interface, the following points should be considered:

The learners will be a heterogeneous group. Some of them may be well acquainted with use of computer and Internet and some may not be. Hence the navigation should be clear to the learners. The buttons to move to the next page or previous pages should be at the right hand side of the screen. There should be an entry and exit point for the learners. The learners should be able to resume the work from where they stopped. Feedback should be provided to the learners. The content should be indexed so that learners can find the information they seek easily. Menus and a table of contents should be provided. Appropriate use of text and graphics should be there. A template for the standard formatting should be provided.

The evaluation of the system should be carried out before presenting it to the target audience. A good E-Learning system will help to disseminate knowledge in a proper way.

The E-Learning environment also provides knowledge to the decision makers in terms of popularity of the course, students’ behaviour and understanding, placement prospects, etc.

3.7 Conclusion

In this chapter we have presented our systematic study of e-learning systems. Our analytic discussion on the importance of E-Learning is presented. Models for designing & developing effective E-learning systems with Knowledge
generation component, are suggested by taking the prototype of E-learning systems for Sardar Patel University. The same platform can be used for organizational learning by the internal staff. An attempt is made in this chapter to suggest a framework of the proposed e-Learning system for managing intellectual knowledge at the University using Service Oriented Architecture.

Any educational institute is recognized at the international level because of the knowledge repository it has in the form of digitized intellectual capital. The challenge for any educational institution is the herculean task of training the teaching staff to develop e-content. In this chapter, we have also suggested various methodologies for developing and delivering the e-content.