Abstract
Computers have been used to assist the learning for over forty years now. Many of the systems which have been developed in the field of computer-aided learning have been very specialized in that they have either been designed solely for a particular course, or they have concentrated on a particular aspect of support, be it communication, provision for practical work, interactive demonstrations, and so on. What is required is a Computer Supported Learner Friendly System which is based on mental models of the learners and Reflective; Adaptive; Interactive; and Discursive characteristics which are discussed in this article.

Keywords
Mental Model, Reflective, Adaptive, Interactive, Discursive

I. Introduction
Computer-Supported Collaborative Learning (CSCL) is a pedagogical approach wherein learning takes place via social interaction using a computer or through the Internet. This kind of learning is characterized by the sharing and construction of knowledge among participants using technology as their primary means of communication or as a common resource [1]. StudieNet [2] was designed with the specific goal of providing support for a particular course in Mathematics. The problem which this raises is that CAL material is expensive and time-consuming to produce, and without a level of adaptability requires a new software package to be created each time a course needs support. This problem is also illustrated in the Athena [3] project in which it is reported that a large number of the projects were conversions between different computer platforms. Analysis of previous systems indicates deficiencies in the approaches which have been taken. Generally, these systems fall into one of two categories; those which are focused on the communications aspects of the problem, and those which concentrate on the administrative facilities. Even systems which do attempt to support both sides of the problem are either lacking in key features, such as support for group working, or are designed specifically for one course, or even problem, with no flexibility to adapt to different applications. The purpose of this article is to provide a concept of learner friendly system which provides support for the learning and information retrieval tasks normally associated with computer-aided learning, whilst allowing users to develop their own learning style.

II. Mental Models
A key process in learning is the construction of mental models by students [4-5]. Mental models are the internal representations which humans hold of real-world situations and processes. Mental models are the link between reality and representational space; in other words, between the way things actually are and the way humans store that information. On this subject, [6] writes; ‘It is now plausible to suppose that mental models play a central and unifying role in representing objects, states of affairs, sequences of events, the way the world is, and the social and psychological actions of daily life.’

In the process of learning, mechanisms are initiated which allow the formation of new mental models or the reconstruction of existing models. An example where mental models would require reconstruction is if mal-learning occurs. Mal-learning is the phrase commonly used to define situations in which a student forms a misrepresentation or an incorrect mental model of a situation [7].

Two aspects of learning which can be used to detect mal-learning are feedback and interactivity. The success of any learning process is directly related to the level and frequency of feedback which a student receives. Interactivity is defined as the way in which a process can affect the progress of another process in a controlled manner [7-8]. Increasing the level of feedback and interactivity in a course can assist in the early detection, and potentially correction, of mal-learning. Thus feedback and interactivity are fundamentals to the building of mental models. [9].

A graphical representation of mental model is shown in fig. 1.

![Fig. 1: Mental Model](image)

III. RAID Characteristics
The characteristics of a high quality learning system are that it should be reflective, adaptive, interactive and discursive which are discussed below:

A. Reflective
Reflective learning helps to develop critical thinking, self-awareness and analytical skills and is important to both staff and students. It involves a involvement by an individual in a reflective process. This can help to inform about what worked or didn’t work, what might need to be done differently, or how individuals may need to develop their behavior or practice. For students it may help them to understand better how theory can be applied in practice or where practice is consistent with concepts and theories. The importance of reflecting on what you are doing, as part of the learning process, has been emphasized by many investigators. Reflective Observation is the second stage (in the usual representation) of the Kolb learning cycle. [10] provides one of the most useful (but contestable) descriptive models available of the adult learning process. Learning is considered to be a cyclic process in which the learners start with some previous experience, reflect on that experience, and then perform a task which leads to
further experience at a higher conceptual level. Kolb thus defined experiential learning as consisting of four processes: concrete experience, reflective observation, abstract conceptualization and active experimentation as shown in fig. 2.

Fig. 2: Kolbs Cyclic Model

**B. Adaptive**

Third-order headings, as in this paragraph, are To improve current state-of-art systems and to increase effectiveness of online education, the focus is now on adaptive learning systems—systems that can adapt the content to match the learning preference of individual learners. Adaptive learning systems demand a new perspective on learning from faculty, administrators, and students. They take pedagogy out of the realm in which the CMS operates (managing course assets) and into the realm of providing an instructional framework for faculty and effective learning for students. A typical adaptive learning model is shown in fig 3. Adaptive learning has been partially driven by a realization that tailored learning cannot be achieved on large-scale using traditional, non-adaptive approaches. Adaptive learning systems endeavor to transform the learner from passive receptor of information to collaborator in the educational process [11]. Adaptive learning systems emphasize:

- systems that readily adapt the learning experience to the skills and needs of the learner
- systems that are flexible and scalable, that allow the content and courseware to be widely reusable and easily organized in different ways at different instructional levels systems that provide content development tools that function across a broad range of platforms, easily used by domain experts who are not programmers—systems that are adaptable to the educators as well as the learners.

**C. Adaptive**

List and number all bibliographical references in The goal of interactive learning strategies is to engage students with the learning process, allowing them to take an active part in acquiring and integrating information as shown in figure 4. According to Saskatchewan Education, learners retain only about 5 percent of information learned through lecture. That percentage increases significantly, to 90 percent, when learned information is taught to others. Interactive learning strategies can be used at any grade level, from preschool through college, and for any subject. Interactive learning involves acquiring information through hands-on experiences and activities, including manipulative, websites, computer software and learning centers.

Fig. 3: Adaptive Model

Various interactive activities are effective for different subjects and different ages. Interactive learning is an effective way of engaging students in their studies, and also increases the level of their understanding because they are learning actively, not passively. In online education, there are presently a number of technologies and instructional activities used to promote course interactions. Frequently used technologies in online courses include textbooks; multimedia that combines text, images, and audio either through Internet or CDROM; streaming audio and video; and synchronous and asynchronous communication tools, such as discussion boards, instant messaging, and voice chatting, and file-sharing [12].

Fig. 4: Interactive Process

**D. Discursive**

Learning is a type of social interaction as shown in fig. 5 in which knowledge is distributed across people and their tools and technologies, dispersed at various sites, and stored in links among people, their minds and bodies, and specific affinity groups. [13] argued that interaction is not enough for students to take a deep and meaningful approach to learning online. The nature of the instruction must be more structured and systematic of a collaborative process of critical inquiry is to be initiated and sustained. Various interactions must be integrated in a coherent and purposeful manner that initiates and facilitates critical discourse and purposefully moves towards meaning and understanding. For most students achieving a deep level of understanding is greatly aided through critical discourse and a process of constantly monitoring the legitimacy of his or her beliefs and comprehension [14].
The author has presented the concept of RAID characteristics and existent. Considering these limitations and few more in this article, education courses have been at a disadvantage in comparison to participants in a course. In the past, students undertaking distance problems [19-20]. A key problem with many traditional distance learning systems is how to support learning and information retrieval tasks normally associated with computer-assisted learning, and yet to maintain a degree of flexibility which will allow learners to develop their own learning style [15-16]. An accepted definition of a learning style is an individual variation in modes of perceiving, remembering and thinking, or as distinctive ways of apprehending, storing, transforming and utilizing information.[17]. A Learner friendly system must build and update the learner model according to what the learner already knows and this may vary from learner to learner. This difference must be considered when in the search of efficiency in the development of LFS. Learner’s performance in the domain, transparency of technical terminology, the learner’s objectives and expectations and his previous experience must be also taken into account [18].

The four factors which were considered as being characteristics of a high quality learning system are that it should be interactive, reflective, adaptive and discursive. One of these four characteristics, that a system should be adaptive, describes how a system must be flexible enough to adapt to different situations. Interactive characteristic emphasizes the importance of student-tutor communication within an environment. The reflective characteristic helps the learners to develop their analytical skills and the discursive characteristic emphasizes the interactions must be integrated in a coherent and purposeful manner that initiates critical discourse and purposefully moves towards meaning and understanding. The mental model prevents the possibility of mal-learning. The RAID characteristics discussed above could be utilized to develop a high quality Learner Friendly System which overcomes most of the challenges faced by the current CAL systems.

IV. Learner Friendly System (LFS)
The aim of a learner friendly system is to provide support for the learning and information retrieval tasks normally associated with computer-assisted learning, and yet to maintain a degree of flexibility which will allow learners to develop their own learning style [15-16]. An accepted definition of a learning style is an individual variation in modes of perceiving, remembering and thinking, or as distinctive ways of apprehending, storing, transforming and utilizing information.[17]. A Learner friendly system must build and update the learner model according to what the learner already knows and this may vary from learner to learner. This difference must be considered when in the search of efficiency in the development of LFS. Learner’s performance in the domain, transparency of technical terminology, the learner’s objectives and expectations and his previous experience must be also taken into account [18].

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V. Conclusion
The field of distance learning is an area which lends itself well to the benefits of computer-aided learning, yet also carries its own problems [19-20]. A key problem with many traditional distance learning courses is that the learners are often isolated from other participants in a course. In the past, students undertaking distance education courses have been at a disadvantage in comparison to those attending an institution in that communication between their tutor, peers and themselves has been severely limited, if not non-existent. Considering these limitations and few more in this article, the author has presented the concept of RAID characteristics and mental model which must be taken into account while designing a learner friendly system. Implementing a learner friendly system provides a generic facility which can be used to support for a full spectrum of courses and subject areas in a distance learning system.

References
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