AN OVERVIEW ON APPLICATIONS AND DEVELOPMENTS IN EDUCATION ON AGENT BASED ONTOLOGICAL COOPERATIVE LEARNING

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Abstract

In this paper, we have defined various types of concepts which are applied in the real time classroom environments such as Ontology, Cooperative Learning through an I-MINDS infrastructure which could enable the students to participate actively in virtual mode rather than passive listening to the lectures in a traditional way of teaching and learning environment. In teaching and learning process, I-MINDS plays a major role where it monitors the students activities and help the teacher manage and adopt to the class where as in learning environment, it has its applications which helps to measure the knowledge and understanding capability of the students which helps them to interact with other agents to support Cooperative Learning Environment. Mainly, we discuss about the agents involved in the development of learning process of education, we also discuss about the methodologies and architecture involved in the development of the learning process through ontological Cooperative Environment.

Keywords: Cooperative Learning, Education, Multi-Agent System, Ontology.

I. INTRODUCTION

Here we apply the concept Multi-agent System in the form of agents which supports the Cooperative Learning activities through Ontological process. In education, as defined in [6], Ontology plays an important role in management of knowledge and representation. It helps to formulate the representation of the learning domain through the comparison of knowledge and relations between the concepts and all the properties which exists. In this paper, we discuss about the concepts which basically explains the research done on the various domains applied in education and its recent developments in education.

In this system, it is applicable in both the ways such as teaching and learning environment. It is basically helps the teacher to teach better and guides the students to learn. Most of the technology user supports to improve the learning process. It has also been proved that it helps to stimulate more interactive learning through Cooperative Learning process.

According to Leen-kiat, Hong Jiang [], they strongly describe the learning capabilities of the students and supports them to develop their knowledge and understanding capabilities. In learning process, it is widely believed that these technologies are

• It is inherited good knowledge and remain competitive in an institution.

• It helps to deliver a cost free effective education.

• Offers more opportunities over Student-Student and Student-Teacher Interaction to gain control over the knowledge.

• It also offers the wider and broader resources to learn about opportunities to learn about faculty and students and their view points.
In our education system, we incorporate this technology named I-MINDS in the real time classroom environment with Cooperative learning methods which helps to support the students to learn and gain knowledge in a real-time environment. Here we also apply the Ontological concepts and its application in education. It is mainly used to guide students to understand the organization of their own learning and organization of their own learning and self-access their own progress as defined in [9]. It is created by the set of people with expertise in content, teaching, psychology and measurement.

The main purpose of our project is

• To improve the teaching and learning process (e.g. : STEM technology )

• To be cost effective such as virtual learning environment, easy access to the knowledge gained in teaching and learning process

• Is to develop new innovating techniques in Computer Science and Engineering such as Multi-Agent Systems and implement various educational tools for the development in the learning architecture as said in [8].

• It is also applicable to investigate the various technologies which is incorporated through Cooperative Learning by using I-MINDS as an active and flexible learning environment.

We describe about the agents involved and the related work which is involved in educational applications. In Section [3], we describe the design and methodology of various domains such as Ontology, Cooperative Learning and Multi-Agent Systems such as I-MINDS through education. In Section [4], we discuss about various viewpoints and practical application of various technologies and developments in its educational architecture.

II. BASIC CONTEXT

The ultimate goal of a human learning environment is to improve the learners knowledge and build software applications which is for the one environments rather than many environments which is designed in such a way that could help user to learn and accomplish the task rather than designing the task for the user. Multi-Agent System has various systems address tasks [9] sorting e-mail and filtering news group messages [7]. By applying various designed tools, it could be used as a relieving tool to the user’s task.

As said and distinguished by Malone, these agent make an important difference between toys and tools with gaming technology. Toys are considered as a module with no external goal whereas tools are considered as a easy to use which could find the users external goal. These kind of external tasks are provided to the user to build the human learning process. It basically teaches the user about the process of learning and teaches the user to reach the goal easily which could easy the process the task.

Generally, this kind of learning process is basically of two types such as training and education. Training is based on the learning of job related skills, etc. In education, It is basically for the academics process such as primary, secondary, college and university. As defined, agents are defined as a flexible, proactive, reactive or social as said in [5].

We also describe about the applications of ontology and Cooperative learning in education. Ontology has various applications in education which helps in the representation of learning process which are related to the concepts and relations. In paper [1], it explains about the representation of learning concepts where as Cooperative learning it helps a method which helps the student to work in groups.

All the methods implemented are developed in to the development phase where it enhances the learning process.
III. ARCHITECTURAL VIEW

A) Cooperative Learning

This is the architectural view of Cooperative learning where it mainly exposes the design of a platform for the learning of control systems based upon collaborative efforts of the students in this area. The context of this platform arises according to some general educative and technical elements. The first element is to help to the technical processes that the students follow in the design of digital control.

The modes involved in Cooperative learning are

- Interaction with the students to undergo the gained knowledge.
- Positive inter dependence of the module
- Helps to process the group discussions
- Involves in technical and fundamentals of teaching and learning process.
- It also helps the person to analyze the responsibility of an individual.

b) Ontological view in education

Ontology represents a multi-dimensional map of a domain of learning. At the top level, it specifies the core concepts and principles, and the cognitive demands which embed them, that are essential to competency in a domain, whether that domain defines a unit, a course, or high school expectations. Drilling down from these core concepts are the supplementary knowledge and skills which students are expected to develop as they progress toward competency. As said in [3], An ontology represents a multi-dimensional depiction of how learning is defined and through what knowledge and skills it develops and also provides an organizational scheme for integrating expectations, mapping progress, and coordinating learning resources and supports By relating (or binding) instructional objects, help routines, worked examples, brief explanations, language requirements, lessons units in courses, professional development, and so on, an ontology can be sampled along different vectors or even levels for detailed development. Our goal is to produce ontology’s that provide clarity, a path toward fewer standards, and analytic
evidence of more challenging, complex requirements as said in [4]. Although typically imagined as a top-down process, we believe ontology development can proceed at different points of entry, for example, by aligning assessment tasks, or courses and curricula relative to the ontology, or move among levels. In our most recent developments, which are based on earlier work at CRESST, we are developing an assessment task ontology that could be used to identify gaps or mismatches in assessments and the goals they claim to assess. The assessment task ontology would systematically link data or evidence for various purposes to support validity interpretations and other technical quality requirements.

Macal and North categorized all these MAS in two types such as,

a) Minimalist model: Based on the assumptions, it is designed to capture the silent feature of the system. These are explanatory electronic laboratories, involving resources of the computer modeling model.

b) Decision Support System: I is designed to answer the wide range of real-world policy questions, makes decisions to support stack holders.

Actually MAS has been applied in the various field of knowledge. Practical cases of uses include [6], the modeling of the organizational behavior, team work, supply chain etc..

c) Multi-Agent System in Education

The agent based application can be classified through orthogonal dimensions which could be classified according to the various factors such as

- Types of agent
- Technology used to implement the agent
- By the application domain itself.
After the establishment of topology, Nwana [4], defined seven categories’ of agents according to their architecture and function:

1. Collaborative agents
2. Interface agents
3. Mobile agents
4. Information agents
5. Reactive agents

IV. Applications and development in education:

a) Application of ontology in education:

- These include, among others, Information Research, Personal Assistants, E-mail Management etc.
- It helps in the management of data
- It helps to capture the knowledge within a certain domain (Organization/Information Systems)
- As a model generally as a data model, helps to capture certain knowledge.
- These models are captured than be queried by users, to answer complex questions and display relationships across a domain

b) Applications of MultiAgent System in Education:

- The main application of Multi-Agent System are Ambient Intelligence, Grid computing, Electronic business, the Semantic Web, Bioinformatics and computational Biology, Monitoring and Control, Resource Management, Education, Space, military and manufacturing applications, and so on.
Whereas Graesser [5], believe that an agent 'must be a continuous process of execution and represented dramatically which divide the autonomous agents into three main groups such as

1. Biological agents
2. Robotic agents
3. Computational agents

V. Conclusion:

We have presented an innovative multivalent system to support cooperative learning among students both in the real classrooms. A teacher agent monitors the student activities and helps the teacher manage and better adapt to the class. A student agent, on the other hand, interacts with the teacher agent and other student agents to support cooperative learning activities behind-the-scenes for a student. Here we also apply various other technologies’ such as ontology, Multi-Agent System which will help to enhance the learning skills and develop the teaching methodology also. Will will try to enhance the teaching and learning methods.

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