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A Study of Intelligence Learning Factors

Mr. Purushottam Lal Bhari[1], Prof. Ashok Kumar Jetawat[2]

[1]*Department of Computer Science and System Studies,*
Mewar Univesity, Chottorgarh
[2] *EA to Chancellor,*
Mody University of Science and Technology, Lakshmangarh

Abstract – Intelligence technologies becomes a necessary part of our life. These technologies are widely used in many fields including educational area. The study is proposed to analysis different learning factors based on intelligence of human and artificial. A survey is conducted with 10 different learning factors and collected suggestions from student of higher education. Learning through technologies has been becomes very popular in today's educational environment. This survey is conducted to find out most demandable technology of learning that works more comfortably for learners.

Keywords – Artificial Intelligence, Human Intelligence, Intelligence Technology, Learning System

I. INTRODUCTION

Artificial intelligence has a lot of scope in every field including educational area. There are many intelligent technologies they playing a vital role in modern education system. Intelligent educational technologies have abilities to perform educational actions for providing a better learning environment to students. For students, intelligence learning is an alternative way to classroom lectures that works more effectively. Artificial intelligence also helps students to become an independent learner. For faculties, intelligence learning may change their way of working and professional role at sometimes, and an opportunity to test students in real business situations is provided by intelligence technologies. Generally the process of learning is an active way to enhancing knowledge. Various tools are involved to make the process of learning and teaching more effective. For the up gradation of technology in AI, the tools have undergone for the modifications. In our society, the information gained at institutions and universities that being a necessary basis could also be too little for the entire life scan. AI involves teaching with the use of technology or through electronic way and in an intelligent environment to support teaching and learning we needed various governmental and strategic measures.

The main reason for the growing popularity of artificial intelligence in India is young working professionals prefer artificial intelligence to climb up the professional ladder. Artificial intelligence is a convenient for all students because with the help of electronic learning they can attend classes and go through their study programs at a time when they are free from other work. The student can also sit according to the convenience of own space and can do the study. The concept of artificial intelligence will improve and expand in the near future and achieve very high class. It may be expected that in addition to high profits earned by faculties is reasonable, students will be the ones to enjoy the highest gain as they will get the education according to their needs, as well as suited to the requirements of their future job positions.

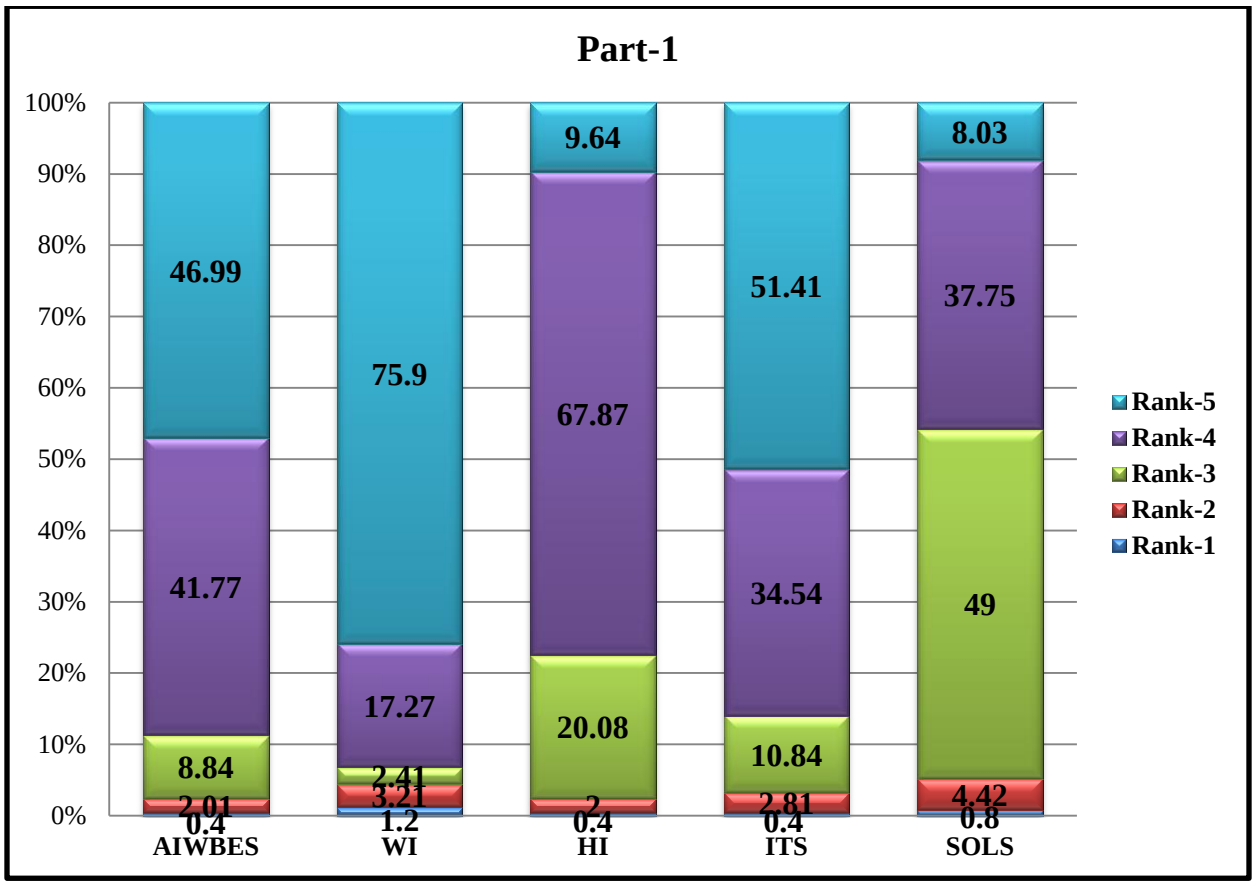
II. CONTRIBUTION OF INDIVIDUAL FACTORS FOR LEARNING

Firstly, we structured a question with 10 different learning factors and framed five options rank 5 to rank 1 for each learning factor. We have received the responses on the basis of individual factors for learning according to this question of survey. This section includes the different individual factors they frequently serviced at present in our education system. In this section, the students were asked to give different ratings as per the importance of these factors in overall learning. In this rating, rank 5 was meant to be very high, rank 4 stands for high, rank 3 stands for medium, rank 2 was meant to be low and rank 1 stands for very low. There total 249 students participate in this survey and gave his valuable suggestions according to interest in which they want to learn. The data was collected from students they study in regular mode or distance mode from different colleges and institutions. The students,

they participated in this survey are of different streams and different places. We can analyze these individual factors after dividing into two parts, first five individual factors are included in part-1 and remaining five factors are included in part-2.

A. *Part-1:* First five individual learning factors are AIWBES[1], WI[2], HI[3], ITS[4], and SOLS[5]. These factors are analyzed using statistical bar graph. According to respondent's data both AIWBES and web intelligence gets maximum supporters of very high rating, human intelligence gets maximum support as rating high with rank 4, intelligent tutoring system also gets rating very high from maximum supporters and semantic open learning space gets medium rating maximum from respondents. The rating of individual factors shows using bar chart with scaling 0 to 100%. The highest rank 5 is indicated by top part of bar graph and the lowest rank 1 indicated from lower part of bar graph.

Figure 1: Contributions of Individual Factors for Learning Part-1



Adaptive and Intelligent Web-Based Education System (AIWBES): It is widely used in modern education system from 1995-1996. As demonstrated by the survey of students, educational field has an opportunity to employ a hug variety of intelligence technologies provided from the web. An approach "just manage on the web" is provided from AIWBES as an alternate of traditional education system. This approach is just web based intelligent simulator for perform educational activities like a teacher using intelligent concept and knowledge base of web. These web based technologies becomes greatly adaptive using a structured concept of a particular target. So the AIWBES system is becoming very powerful intelligent tool for new generation students. It works like an intelligent human for delivering knowledge and solving queries related to subject. These kinds of systems are developed using intelligent

[1]Adaptive and Intelligent Web-Based Education System
[2]Web Intelligence
[3]Human Intelligence
[4]Intelligent Tutoring Systems
[5]Semantic Open Learning Space

tools for intelligent behavior and the basic purpose of these intelligent systems is providing required services to students like managing schedules of assignments and exams, reply with suitable answer for given queries, managing detailed information about every student with status of all subjects and some other.

Web Intelligence (WI): As current analysis, web intelligence shows glorious opportunities for learners efficiently and become a strong challenge on front of other educational technologies. Web intelligence plays the vital roles in perform intelligent tasks for practical issues and helps in growing information technology for new generations at advance level. Mainly web intelligence may be considered as an enhancement or an extension of artificial intelligence and information technology. According to survey results a way of proper development can be structured in modern education system, web intelligence can become the vital application of artificial intelligence education for providing an efficient environment. From the technological education point of view web intelligence have very powerful approaches, it is also become a most research field for finding new applications they can become support of intelligent technologies. Web intelligence is known as multidisciplinary area in education system. Web intelligence deal with many of data utilizing services they can use for developing new intelligent applications for supporting information and communication technologies.

Human Intelligence (HI): It is the foundation of artificial intelligence. Human intelligence is a natural method and works very strongly for any activity. Human intelligence works very strongly to solve each problem with real time argument and emotional behavior. Both features are very strong factors of human intelligence. In education systems, there is a strong role of human intelligence in every activity of classroom education. Traditional education system is fully dependent on human intelligence because there all activities are performed by human in a classroom on the front of students. In our education infrastructure, intelligence is a lot of vital factor. We have a tendency to should have detected the words like AI in distinction with human intelligence. Technological growth in education system is increasing spending time and scientists' area unit a lot of curious about creating one thing innovative that become hand of education system.

Intelligent Tutoring System (ITS): An ITS system is intelligent computer code that developed to assume a human teacher's activities and proper guidance to behave like a person. Intelligent tutoring system can handle different activities like question answering, feedback, and providing instructions etc. to manage proper adjustments. These intelligent systems are greatly able to work with hug students in special manners, they are individually and simultaneously. We can take a general example, if we need to learn something at 11:00 P.M. the night before an exam then it be available. It will be a great help for that student because the human tutor should not do this at that time. Intelligent tutors have been shown to improve student understanding and assessment scores for better learning environment. An intelligent tutoring system can easily maintain important tasks due to providing data at real time to the instructor and for that reason reliable teaching methods are refined from developers. Because educational institutions cannot assign a human tutor to each student, ITSs are a useful surrogate to offer any student individual help at any time, calibrated to his or her own learning speed and specific learning requirements.

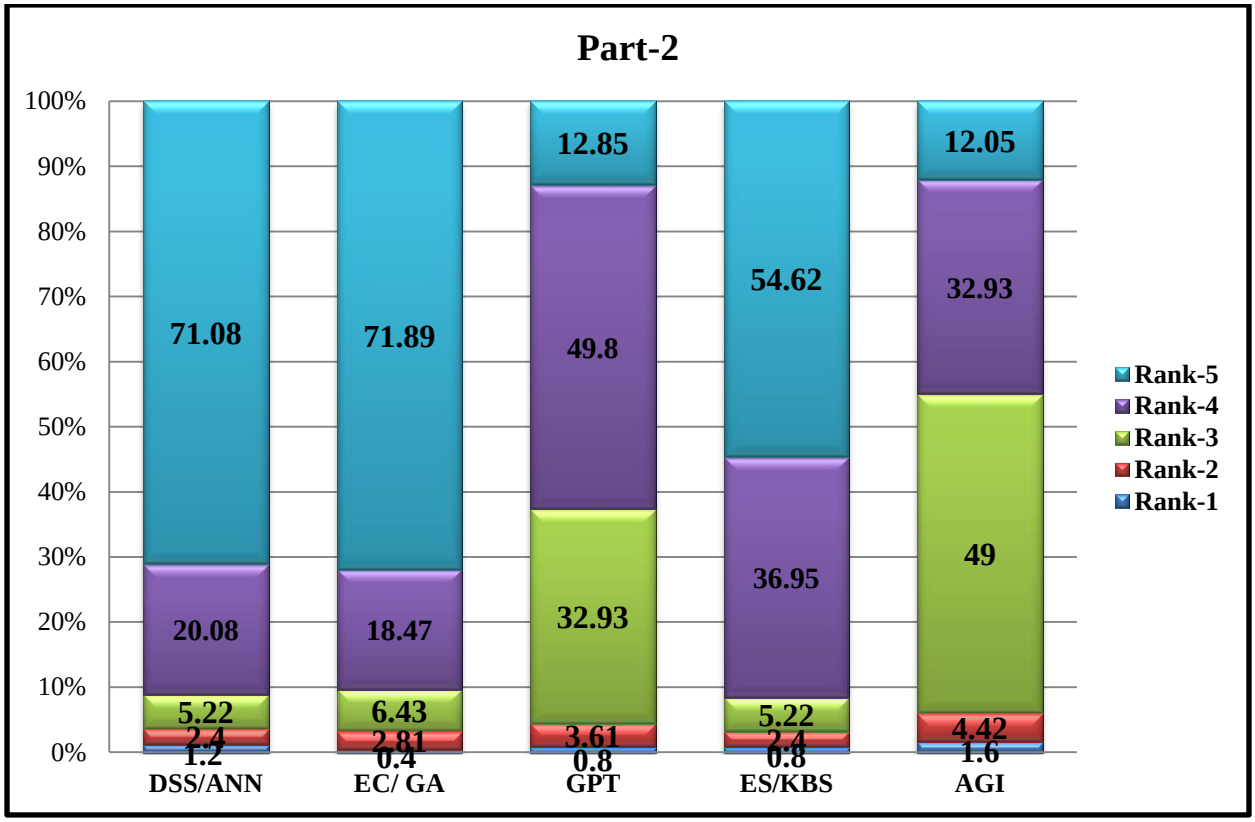
Semantic Open Learning Space (SOLS): When this system is used by students, generally it starts from initial stage. At first, semantic open learning space has many pages and sources, they are provided with a document introducing the main subject of learning to a particular level. All documents are can be taken from different sources as documents like websites, intelligent software, and open source pages etc. When a learner clicks on a mentioned concept in the document, it is added to the concept map in the concept map window. Basically the concept map display is designed for proper learning and it focuses on the particular events. Finally the center of the concept map displays the timeline of the events.

B. *Part-2:* After analyzing first five individual factors in part-1, we will analyze remaining five individual factors in this section. In part-2, there are five factors like DSS/ANN[6], EC/GA[7], General GPT[8], ES/KBS[9], and AGI[10]

[6]Decision Support System / Artificial Neural Networking

Architectures. According to respondents' data the factors artificial neural networking, genetic algorithm and knowledge base system gets maximum supporters of very high rating as rank 5, game playing technique gets maximum support as rating high with rank 4 and artificial general intelligence gets medium rating maximum from respondents. These collected data shows the demand of artificial intelligence technologies based factors for learning, because intelligent technologies also have abilities to increase power of student's brain. Thus, maximum learners want to study with intelligent technologies for taking advantages, and then they support these intelligent technologies with higher ratings. All these ratings collected from different students are represented in following bar graph.

Figure 2: Contributions of Individual Factors for Learning Part-2



Decision Support System / Artificial Neural Networking (DSS / ANN): The Decision Support System using artificial neural networking is a very powerful tool to build an intelligent education system. The basic concept of artificial neural networking is drawn from biological neuron system. Neural networking has layers of neurons; they take input from user interface and process data for preparing required result. The neurons are basic entity of artificial neural networking that play an important role in making decisions in an intelligent machine. This intelligence factor got good rating score from students. Artificial neurons are used for processing information given by user or knowledge base system and it is strongly working for perception system. When a decision support system wants to get decision then it is required enough and strong values, which are provided by artificial neural networking. Decision support system is used in intelligent query optimization system to giving quick response. Students want quick response of his query in any learning environment that can be provided by intelligent query optimization system using decision support system.

Evolutionary Computing / Genetic Algorithms (EC / GA): Evolutionary computing is the basic requirement of today's education system, because there required some changes for better environment. Students require easy

[7]Evolutionary Computing / Genetic Algorithms
[8]Game Playing Technique
[9]Expert Systems / Knowledge Base System
[10]Artificial General Intelligence

solutions for complex problems. If wants to find best solutions for solving complex educational problems then we must require genetic algorithms for it. Genetic algorithm is the powerful tool that can become the base of evolutionary computing for finding solutions of complex problems. According to respondents' support, it can be said that the demand of evolutionary computing is very high and the genetic algorithm is a very strong intelligent tool. Evolutionary computation is real demand of today's education system and it can be possible using collection of genetic algorithms for developing solutions were inspired by biological evolution. It develops solutions for complex problems using AI and soft computing algorithms.

General Game Playing Technique (GPT): According to student respondents and ranking given by students, game playing techniques can play an average role in education system. I think it is reliable for practical education but more reliable in school education for lower standard classes. It is a fact that there are a lot of chances to develop a valuable tool for establishing in field of education using artificial intelligence with general game playing techniques. Intelligence technologies allow teaching to a subject with different methods. This method is very close to natural activities due to game playing technique with practical approach, so it is very advantageous for learning process. This intelligence approach is also used for way of experiment, where learners will test with different methods to indicate a challenging and interesting practical activity. Intelligent technologies can develop different intelligent game technique for different practical subjects for easy learning. This technique works on the competitive aspects, if students use this technology for learning and pitted against one another for solve any problem of a subject then they progress fast and perfectly. So the general game playing technique is very glorious prom learning point of view.

Expert Systems / Knowledge Base System (ES / KBS): Expert systems are the most important applied area of AI. A properly defined knowledge base system with proper intelligence is absolutely known as an intelligent expert system. Expert systems are always helping us using intelligence and behave like a smart human full of knowledge and giving us advice in many areas, where it is impossible to have many humans do the same thing. In the modern education system, many applications of the expert system are working to play the vital role in intelligent tutoring systems using some multimedia and other information handling applications. Adaptation techniques can become the base of this kind if systems to providing assistance of students for better understanding during learning process. In this process student's ability and prior knowledge are also included for managing proper communication. According to my view, knowledgeable systems are much useful as an intelligent training technique because they are developed with intelligent features which support users to put different queries. It is sure that these kinds of knowledgeable systems will very advantageous to students because the answers are prepared in the class environment without any referring to the facility member. The expert system also able to give proper reason of the provided answer of any asked question to related field. This is a very glorious feature of these intelligent educational expert systems that can build more understanding and confidence for an answer to a student or learner. There some more features are available they make them great and demandable from education point of view, because knowledgeable systems have feature of adaptively managing educational activities for every learner according to learner's ability and situations.

Artificial General Intelligence (AGI): Architecture: Artificial general intelligence could execute any educational intellectual process with success that a general person can perform. It is more reliable intelligent technology for research and education. The initial target of artificial intelligence analysis is that the typical topics managed in science fabrication and futurism. Therefore, the tool artificial general intelligence is also referred to as full AI, strong AI or capacity of intelligent machine to execute operations / actions.

III. CALCULATION AND ANALYSIS OF COLLECTED DATA

In the below table 1 five rating scales are arranged with decided marks to each rating scale. As per the rating of respondents in the above figures, we have framed the responses in a five point scale in which the value of 1 stands for very low, 2 stands for low, 3 stands for medium, 4 stands for high and 5 stands for very high. The marks which were decided for different ranks are given in table 1.

Table 1: Marks of Different Ranks

Different Ranks	Marks
Rank 1st	2
Rank 2nd	4

Rank 3rd	6
Rank 4th	8
Rank 5th	10

Table 2: List of Individual Factors for Learning

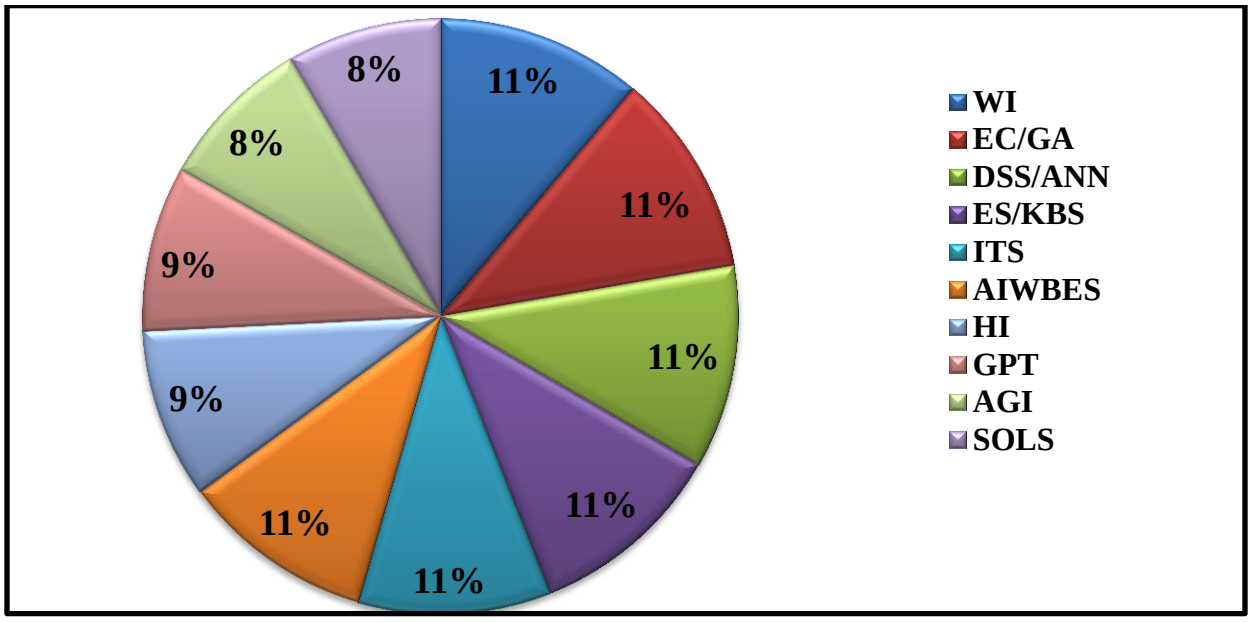
S. No.	List of Individual Factors	Total Score
1	Adaptive Intelligent Web-Based Education System (AIWBES)	2156
2	Web Intelligence (WI)	2308
3	Human Intelligence (HI)	1914
4	Intelligent Tutoring Systems (ITS)	2160
5	Semantic Open Learning Space (SOLS)	1732
6	Decision Support System / Artificial Neural Networking (DSS/ANN)	2278
7	Evolutionary Computing / Genetic Algorithms (EC/GA)	2284
8	General Game Playing Technique (GPT)	1844
9	Expert Systems / Knowledge Base System (ES/KBS)	2202
10	Artificial General Intelligence (AGI) Architectures	1740

For the calculation of the total score in the above table 2, we have added scores of rank 1, 2, 3, 4 and 5 of each individual factor using the following formula.

Total Marks of a Factor = (No. of Rank 1 Supporters *2) + (No. of Rank 2 Supporters *4) + (No. of Rank 3 Supporters *6) + (No. of Rank 4 Supporters *8) + (No. of Rank 5 Supporters *10)

With the help of the marks which we have decided for different ranks, we calculated the total scores of each individual factor given by respondents. As per the above analysis, the maximum score gained by use of web intelligence and the minimum score gained by semantic open learning space. Therefore, by this we can conclude that AI technology plays a vital role in today's education system as compare to the other learning parameter.

Figure 3: Support of students to different learning technologies



The above figure shows support of students to each technology that can perform educational tasks frequently. Every individual factor of learning represented with supported percentage given by students. We found at the time of survey that students are already motivated about intelligent technologies, they show the highly requirement for these intelligent education technologies. According to figure, there maximum supported technologies are web intelligence, evolutionary computing with genetic algorithms, decision support system with neural networking, expert system with large knowledge base system, intelligent tutoring systems and intelligent web based education system. Second choice of students determined in the form of human intelligence with classroom education system and game playing techniques. Least supported technologies are artificial general intelligence architecture and semantic open learning space. According to this study, it can be said that the implementation of intelligent technologies in education system may be very advantageous because modern education system has been become very hi-tech already, so there learners require efficient technologies for better learning.

IV. CONCLUSION

The students were asked to give their opinion on 10 different individual factors of learning. We have included Adaptive and Intelligent Web-Based Education System, Web Intelligence, Human Intelligence, Intelligent Tutoring Systems, Semantic Open Learning Space, Decision Support System / Artificial Neural Networking, Evolutionary Computing / Genetic Algorithms, General Game Playing Technique, Expert Systems / Knowledge Base System and Artificial General Intelligence Architectures. For the analysis of contribution of these individual factors we have used rating method. In this rating method, rank 5 was meant to be very high, rank 4 stands for high, rank 3 stands for medium, rank 2 stands for low and rank 1 stands for very low. We have decided marks for different ranks, for rank 5 we have given 10 marks, for rank 4 we have decided 8 marks, for rank 3 we put 6 marks and so on. After applying the rating method we came to know that highest marks i.e. 2308 scored by use of web intelligence and lowest marks obtained by Semantic Open Learning Space 1732 marks.

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