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Internet of Things (IoT) and Artificial Intelligence as well as Emerging Technologies in Enhancing the Learning Sector

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***Abstract*—This paper is discussing the internet of things (IOT) and how these technologies are working in student learning. There are many developments have observed in the education industry due to internet of things (IOT). The problem discussed in this report is related to the improvement of teaching methods and material to increase student learning enhancements. A detailed of the literature review about internet of things (IOT) that associated accessible which would help in understanding the applications for IOT in education industry. The results of the literature and analysis of internet of things (IOT). showed that there is positive relationship between internet of things (IOT). applications and learning of students. Students are learning online effectively with the help of the internet of things (IOT).**

Keywords—IOT; learning enhancement; Technology.

I. INTRODUCTION

This Internet has evolved from the connection of people and later on photos, videos and texts for more recently objects of physical nature. Utilization of sensors, physical objects can e including the talking of data transmission from one source to the other and even command one another will also be becoming part of the social networking, much in the similar ways that the people will be tagging the photos on Facebook. In this perspective, the value for such systems and objects will be enhanced for learning and research. The education system and student learning is mainly including the exams, books, grades and marks where creative learning is included in the process. The teachers can teach in the syllabus but the studies can study that only and providing exams through cramming. Need of hour is deeper and creative thinking. This is possible through the integration of IoT in education for student's learning. This study is based on analysis of IoT implications in education system. Education system can make it possible for the teachers for identification of issues in which the students tend to create mistakes by the analysis of records of students. In performing this, it will also permit teachers for improving the teaching methods and materials. This will not only be making it possible for the students for utilizing online teaching materials in class but they will also be able for accessing these materials in home, utilizing them for preparation for a reviewing the lessons. Objectives of this report include analysis of Internet of things applications and its application for student learning in current environment of education system. To analyses the Internet of things four pillars existing in education, to assess applications of internet of things in educational system, to find the Internet of things applications details and discussion in studies, and to provide literature analysis and results for Internet of things application in the education system. The development and application of technology for IOT has encouraged technological innovation in the preservation of education, the proponents of this technology hope that shortcomings such as processors, imaging, communications and information technologies will become more robust and cost-effective over time. Internt of thing technology is one of the most prominent recent developments and is in fact a means that will take the educational environment to a new advanced level, but for a start, it may be important to define the concept of Internt of thing technology . Whereas the definitions of Internt of thing technology indicate that it is a computer representation that creates a perception of the world that appears to our senses similar to the real world. Through Internt of thing technology , information and experiences can be transferred to the mind in an attractive and more interactive way. It is also defined as a means consisting of interactive simulations using the computer. The user feels the place and the actions. It is used in games that make the person as if he were part of the game, and he feels as if what is happening on the screen is really happening to him. He feels that he is flying, for example, or climbing a tree, or driving a car at high speed, and he can reduce its speed.. The idea of Internt of thing technology (he means Internt of thing technology systems) is to convince the user that what is happening is real, even if what is happening is not real or actual. Despite his foresight for the future of this technology and the diversity of its applications in libraries of all kinds within the services they provide and the activities they perform, he warned at the conclusion of his article of the need to memorize awareness when employing the applications of this technology, as he mentioned a text: "One of us should not look at these systems as It

is a way to escape from the actual reality in which live to another alternative reality that formulate ourselves. Rather, deal with it as a tool that enables us to create an artificial world that will increase our understanding and awareness of the dimensions and requirements of our real world in which live and find optimal solutions to the difficulties and problems face in it. Which the author largely agrees with.

II. Literature Review

IoT applications in education is working in its initial level but some of the universities and institutions are leading the process in stating how the IoT can be utilized in an efficient way for young people's education and in long run for public. This section is providing four key pillars of application of IoT in educational field.

IoT applications provides people connecting with the internet utilizing the various social and devices networking [1]. It is also very soon for the prediction for channels people will utilize for connection for internet in future that is certain is that via such channels, people will be connected in hyper way. Education sector should also understand how the people can be connected for internet for enhancing the application and learning of knowledge as a results. Time for mastery will also be enhanced for the knowledge those will be utilized in the next stages [2].

Process provides the key role for how data, people and things can be working together for delivering the value in connection with the IoT world. With the correction of process, connections can become related and values are added as the right information has been delivered for the right persons in the right time in an effective way. Ensuring that the young people will have the access for learning opportunities meeting their needs will provide the education in a more efficient way, improving the time for mastery and motivating learners [3] [4] [5].

As things will be connected for the evolvement of the internet, they will also be creating more intelligent ways and providing highly effective and useful information. As compared to just reporting the raw data, the connected things will provide the high level of information for computers, machines and people for quicker decision making and further evaluation. There are various applications for this in education. For instance, the learners must be tagged for the physical objects, collection of data pertained to those objects and then feeding that information for other programs for analysis, improving the research accuracy [5].

Things are considered as the physical items those can be linked with the people and internet via sensors. The sensors can provide the things a voice as their capturing data, sensors enabling things for becoming the context aware, providing more experiential information for supporting machines and people making the valuable and related decisions [5]. For smart sensors are being utilized in the current times in bridging the monitoring of temperatures and traffic density in the real time. In this perspective, the students can also be learning the physics and other subjects using observation and portable devices for bridging their peak traffic times.

IOT is considered as one of emerging technologies which help people to achieve desired outcomes with high efficiency rate. The applications are designed in a way that provides the solution of problems with the intelligence level of humans. The technology uses the input (knowledge) to create the output and similar to the behaviour of humans. The IOT applications is considered as useful in different industries such as education, health care and manufacturing industry [8]. The IOT applications highlights can problems and can identify the problem and reason for the problem and can highlight the solution for the problem in different industries such as education. The IOT applications collects the same domain knowledge from different experts. In other words, IOT applications is collection of knowledge from different sources and use the knowledge to create positive outcomes.

The IOT applications is used in education in different ways such as promethean which is helping the students to improve the interaction in academic material. The study showed that the use of promethean which is an important IOT applications has improved the interaction of students in colleges by 8.5% [10] [11] [12]. In addition to it, scan maker is an important practice of IOT applications which has helped people in improvements in education industry. With the help of wire or wireless, scan maker can easily scan editable text from the book, paper or document and can transfer it to the phone or laptop. With the help of this kind of IOT expert system, students can translate the text in more than 40 languages which has enabled the spread of knowledge easily and has enabled the learning easy for the students. In sum, it has enabled reading and learning easy for the students and provide quick outcomes.

Another most important practice of IOT applications in education industry is sweet rush which is helping students in designing and building learning solutions for e-learning and mobiles [10] [11] [12]. It helps students to get customized instructors which help in getting real time feedback and increase the participation of the students. With the help of this IOT technology, educational institutes are providing the training sessions and programs to the teachers who can provide feedback fast to the students and can ensure effective learning practices [13][34][35][36]. It projected that by 2024, 25

billion "things" would be connected to the internet. This association will enhance the quantity of specific information, and insights derived from this data will facilitate autonomous management and informed decision-making. Several mechanical and fabrication environments have employed machine-to-machine communication for an extended period, including RFID and sensor systems. Despite the Internet of Things (IoT) existing for over a decade, two developments have been the primary catalysts for its evolution. The key factor is the significant advancement in portable devices and applications; the current situation is characterized by extensive access to wireless connectivity. Furthermore, the expansion of knowledge-based capital (such as software, information, intellectual property, firm-specific competencies, and organizational capital) and the ascent of the advanced economy are essential factors for rapid IoT transformation. Accelerated advancements in hardware, software, and communication technologies have enabled the proliferation of internet-connected sensory devices that deliver observations and data measurements from the physical realm. By 2025, it is estimated that the overall number of linked devices in operation will range from 25 to 50 billion[30] 31] [33]. As these figures expand and inventions mature, the volume of data disseminated will rise. The technology of internet-connected gadgets facilitates communication and linkages between the physical and virtual realms, hence perpetuating the expansion of the existing internet through the Internet of Things. The IoT generates substantial volumes of big data characterized by temporal and spatial dependencies, many modalities, and fluctuating data quality [14] [15] [16].

One of important IOT is blackboard which is considered as connected learning experience and ensure effective support network. This IOT applications shows that IOT applications provides a digital learning environment and increase virtual classroom technology [17] [18] [19]. In literature, many authors stated that IOT applications is enabling students to continue their education in this pandemic. The collaboration has increased between teachers and students due to IOT applications (Poli and Boudet, 2018). Students can access all their courses with the help of this IOT applications and ensure maximum learning experience. In other words, it can be said that different kinds of IOT applications are helping the students to improve their learning experiences and to achieve excellence [20] [21] [22].

III. METHOD

There are various studies available in market for different technology s in information technology field. One of the key methods and application is internet of things. It can state the major changes and minor impacts those cane be analysed by studies. The IT methods are including the primary and secondary method of data availability for studies. Primary method of data analysis state higher rate of research and analysis. The rate of change can be found through assessment of online available information in this matter. The secondary method of data collection shows information available online and its application on discussion based analysis in current study. This study will also focus on secondary method of data collection as primary method of data collection is time consuming and costly for such short span of time for research.

IV. RESULT AND DISCUSSION

The understanding of IOT applications through literature and other data collection showed that IOT applications is one of important developments in the history of technology. In online student learning, the role of IOT applications is important because it has increased cooperation and collaboration among the students and teaching staff [20] [25] [26]. There are different kinds of IOT technology s are discussed in the report which enable improved learning platform for the students in this pandemic. For instance, use of promethean which is an important IOT applications has improved the interaction of students in colleges by 8.5%. Students can change the language of the text of the books through IOT technology s to increase the understanding of students. In sum, the effective learning platforms are enabling students to make the learning experience effective [27] [28].

V. CONCLUSION

Summing it up, it can be said that the role of IOT applications is important to consider in improving the learning experience of the students. It has enabled both teaching staff and students to increase the collaboration and to achieve the goals of higher excellence. The applications are designed in a way that provides the solution of problems with the intelligence level of humans. It has made many developments in the life of students and teaching staff which can lead to many positive outcomes related to performance in education industry. This technology associated with IOT are forcing educational institutes for providing the training sessions and programs to the teachers who can provide feedback fast to the students and can ensure effective learning practices. In the end, it is said that the importance of IOT applications is increasing in the education industry and create developments related to the success and improvements in the education industry. For this purpose, the help of artificial

intelligence is important to consider that enable successful goal achievements.

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