

Computer Science in Compulsory Education Curriculum

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ABSTRACT

Computers have become a part and parcel of life and with it we have seen various new applications of computers and developed a new field of science i.e. "Computer Science". Computer Science is not only a study of programming languages but it is also a study of design and use of computer for application of the theory from different fields. Artificial Intelligence, Virtual Reality, Big Data Analytics, Networking, etc. are a few prominent uses of Computer Science that are seen to be having immense potential for developments in future. Since there has been a major focus shift on technology, including Computer Science as a compulsory subject in the education curriculum is very important. Many education curriculum have been designed based on the present use of technology but are being offered as an optional subject, whereas Computer Science can no more be viewed as a secondary subject and should be a necessary qualification irrespective of the field of study a student chooses to pursue. This paper highlights the main reasons for the subject to be included as a compulsory education curriculum. Not only does the paper highlight the reasons but it also states the significance of Computer Science in the future.

I. INTRODUCTION

Computers have evolved faster than any other innovation by humans and have managed to be an essential part of day to day lives of mankind [1]. The reason behind computers being the most favoured tool by humans is its time saving quality that enables organizations to interpret results from extensively large data [2]. Availability of large data due to the consistently increasing population has led to the development of a new field in science i.e., "Computer Science" [1]. Computer Science is one of the fastest growing and highest paying career paths in the world. However, it is being observed that there is a decreasing supply of teachers and students in Computer Science [2]. The reason behind the decrease in interest is directly related on how exposed the students are to information and technology, also whether the resources are made available to the students at early stages to develop an interest in the subject. Computer Science is a study of computers and computational systems [2]. Computer Scientists mostly deal with software and software systems; this also includes the theory, designing and application. Areas of study for computer sciences comprises of artificial intelligence, computer systems and networks ,database systems, numerical analysis, programming languages, bioinformatics, visual and graphical analysis, etc. Although knowing how to program is important to study computer science, it is only the basic step in studying the field and computer science is much more than only programming aspects [2].

This paper is not concerned with the influential development of computer science in human life, but its primary concern is importance of computer science in the education curriculum and the need of the hour to make computer science compulsory in the education curriculum [1]. In this paper I would like to highlight the facts about computer sciences and make a rational argument about why computer science deserves a place in the compulsory education curriculum, and shall conclude with the impacts and benefits on the future research and development in this field [2].

Reasons for Computer Science to be an integral part of the Education Curriculum:

When it comes to computer science, it is not just a field with programming languages and algorithms based on computer skills. But it is a blend of 4 main fields: Science, Technology, Engineering and Mathematics which can combined be referred as STEM. The term “STEM” is used to address the education policy and curriculum choices in schools to improve knowledge and grasp of the new age science and technology [1]. One of the main reasons behind making computer science a compulsory subject along with STEM is that it will curb the problem of students skipping out on computer science as an elective subject and gain knowledge about the field from a younger age and get accustomed to the new programming languages, computer science will be treated as any other regular subject [2]. This will burst the bubble created around computer science; about it being a subject of only computer skills and nothing beyond it, students will be introduced to this subject at a very early stage which will result in more students choosing computer science as a career opportunity [1].

Regardless which career path a student chooses, students who have studied computer science have an extra edge over the other students who happen to be unaware of the subject or had skipped the elective subject in schools [2]. There are various job opportunities awaiting just for the students with a graduation degree and also have a deep understanding of computer science [1].

Computer science not only provides job opportunities but it also enhances student’s logical thinking and reasoning abilities. Computer Science deals with a high intensity problem solving and so the subject will also develop new approaches of thinking and solving the problems [2]. Not only is it a claim , but it has been proved that students who have been exposed to programming languages at young ages have shown excellent development of critical thinking in the student[2]. Not only is computer science closely related to mathematics but it also deals with a high amount of statistics. The combined curriculum of computer science and statistics is being implemented in a few colleges in India, the subject is commonly known as “Informatics” [1].

There are various open sources of programming communities that have made significant progress in computer sciences, but one can only gain knowledge from these free sources if the person has the basic knowledge of programming [2]. By keeping computer science as an elective subject, the students who have skipped on the subject will unfortunately be locked in their own inability to learn new developments in the technology [1]. But if computer science was a compulsory subject in the education curriculum, at least any student who wishes to learn the advancements of science field through these open sources can do so on his/her own [2].

With the consistently increasing population, it is being difficult to handle the data without any help from computers; it has become an essential need for the world to have more programmers to handle such huge amounts of data [1]. The need for new programs is constantly increasing, though there are arguments being presented that Artificial Intelligence and Automation might decrease the need of programmers [2]. But I believe it won’t affect the increasing need of programmers because of the systems of Artificial Intelligence and Automations will require continuous updates as we progress further, as the models built now do not cater the needs of future [1].

“Digital India” one of the many programs that have been launched in India is a move of our nation towards computer sciences and acceptance of the new technology over the old mainstream tedious work [1]. It is the need of an hour that people realize importance of computers and its advancements in the field of science to be significant. Businesses, Healthcare, Government Offices, etc are highly dependent on the computers and constantly updated software and programs [2].

Providing the students with the knowledge of computer sciences along with basic programming skills will give the student a chance to learn the subject at an early stage and they shall have more time on advancing and developing their skills sets when they wish to pursue a higher level degree in the subject. Implementing this will result in obtaining more skilled and efficient programmers [1].

Various subjects such as Mathematics, Statistics, etc have found their applications to be made only with the help of computer sciences and so it becomes much more important for a person with any specialized subject to have additional computer knowledge to maintain a balance with the technology [2].

Impacts and Benefits on future research and development:

Computer Science is a versatile field and it has surely become a need for many industries, also for the industries not directly linked with technology, Computer Science plays an important role[1]. A Computer Scientist can even make his own path as a career in business, medicine, agriculture, social-welfare, etc.

Looking at the present, the role technology plays in our lives we can definitely conclude that it will be an essential part of human growth in the future; this also means that the need for more talented computer scientists will never end. Not only is it a need of future but in present as well we do need some highly talented Computer Scientists. In addition, the increasing use of technology means more job opportunities for the students.

The imprints of computer science being essentially useful in development of a country are seen in the government policies as well, one such implementation of government policy is the introduction of “FASTag” in order to reduce the waiting time at toll plazas on national highways [3].

Finally, inevitably the upcoming era will be a digital era and to compete in this environment computer science plays a very important role. So it becomes highly important that the coming generations are introduced to this subject at early stages in order to make them ready for the digital era and to develop and advance as a nation as well.

II. REFERENCES

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