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Popularizing Science and Science Competitions

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Abstract. This positional paper addresses the fact that while the present civilization is the outcome of hard labor of scientists and engineers, our society appears to fall behind in ensuring continuity of scientific endeavor through providing knowledge workers sufficient incentives for their sleepless nights and unselfish commitment to science and technology and to mankind. In this article we emphasize necessity of science and popularizing it to science students, scientific workers and common mass through innovative competitions and dissemination through mass media. This will keep young people with aptitude in science involved in the education of science and technology and thus help sustainable development of civilization through science and technology.

Keywords: science education, competition.

1. Introduction

This is not a research paper and it expresses personal opinions of the authors gained from experiences in science work, science education, science competitions and other events. Scientists and engineers have been playing significant role in creating the civilization of the present day from those of ancient times, when human beings could not establish their superiority over other species. Nevertheless, it does not appear that our society is yet ready to recognize duly the hard work knowledge workers put together to create a better world for all of us. Ease of life and societal recognition do not appear to be for these dedicated souls that work so hard to discover the truth of Nature and utilize it to the benefit of mankind. Even then each branch of science and technology is fathomed, new branches are created by the scientists and engineers although they are not as much recognized as workers of other fields of walk. It is now becoming more and more difficult for new comers to extend the horizon of any branch of science and technology.

In the early 2000s Lyman and Varian (Lyman and Varian, 2003) of UC Berkeley estimated that total amount of new information stored annually on different media double approximately every three years, whereas the IDC's (International Data Corporation) (Gantz and Reinsel, 2012) regular updates of "Digital Universe" suggests that digital universe is doubling in size every two years. Moreover, the data generated worldwide was projected to grow from 33 zettabytes in 2018 to an estimated 175 zettabytes by 2025. IDC projects (IDC Study, 2020) that by 2020 the digital universe will reach 40 zettabytes (ZB), which is 40 trillion GB of data, or 5,200 GB of data for every person on Earth. This amount exceeds previous forecasts by 5 ZBs, resulting in a 50-fold growth from the beginning of 2010.

So it is clear that for processing so much of information we need many dedicated brilliant souls to work in many different fields and in their still greater number of intersections. Never ever human civilization faced a situation where it needed more knowledge workers than now. But unfortunately leaders of civilization do not seem to be appreciative of the need of development of science and technology for the civilization to sustain and prosper. This era has become a lot too much market oriented with commitment and dedication being replaced by market economy. Chat-GPT suggests that globalization and competition, funding cuts and financial pressures and increased emphasis on employability are the main factors driving education to market orientation. While there are potential benefits like responsiveness to labor market, innovation and efficiency and diversity of options there are concerns as well like narrowing of educational goals, inequality and commercialization of education. This has resulted in our bright students with praiseworthy aptitude in physics, chemistry, mathematics and other branches of science and technology opting for education in other branches that they did not pursue their education in only because now opportunities in those branches have been too much for them to take their eyes away and stick to the field they have proven capability and aptitude in. The society seems to have lost its grip to ensure its own survival and enrichment. However, responsibility of this self-destruction of the society should not only be borne by the overall leaders of the society, it will also lie on the shoulders of knowledge workers who are failing to convince the society of their usefulness for the survival of the civilization.

No field of human endeavors can be neglected even the least recognized, least appreciated, sufficiently ignored field like science and technology at least since without it no other field of human endeavors can survive not to speak of excel.

We know sports and entertainment are very popular in our society of *homo sapiens,* be it very brutal event like wrestling, boxing or Spanish style bull fighting (corrida de toros) although we are supposed to excel over other species especially in our brain power and not necessarily on our brutal power or strength. A sportsman of the highest order of popularity, say in football, is appreciated and awarded by our society with a sum of some 100 million Euro at the age of thirty (Rudling, 2024). Similar figures (Forbes, 2023; Wilson, 2024; Medium, 2024) can be found in tennis, golf, boxing and other sports. There are hundreds of the highest achievers in science and technology who are recognized for their achievement by Nobel Prizes only at the flag end of their life, when these earthly awards could hardly add to any enjoyment. Commitment of science

workers/educationists can hardly be exaggerated and the society seems to be indifferent to it. Can this difference in recognition be logically established? Dr Haim Ginott (Ginott, 1972) once rightly phrased, "Teachers are expected to reach unattainable goals with inadequate tools. The miracle is that at times they accomplish this impossible task." And recognition of these committed efforts by the society has been well spelled out by Evan Esar (Esar, n.d.) in the following statement "America believes in education: the average professor earns more money in a year than a professional athlete earns in a whole week." While ordinary people may fail to appreciate the necessity of science and technology for the progress of mankind should the leaders follow the footsteps of the popular trends or they should come forward to save humanity by appreciating the feat and encouraging knowledge workers?

2. What is Wrong?

In no case should popularity be the only consideration for degree of appreciation or recognition. The need of civilization, its priority should also be addressed for our survival. However, at the same time academicians have immeasurably failed to play their role in creating due appreciation of the society for knowledge works. In fact, can we confidently say that science has become popular among science students and science workers? Could we be confident that the best student in physics would prefer association of a renowned scientist than that of a well-known entertainer? If the words physics and scientist are replaced by corresponding entities of entertainment or sports would there be any doubt in the answer to the question? So we have to address the problem of making science events popular among science students at least as popular as entertainment or sports are popular to them. So far we have failed to do so. Let me give an example. Before 2010 in IOI (IOI, 2010) we the leaders and deputy leaders did not have clue as to the performance of our teams. Possibly even contestants did not know much about performance of other competitors. For the first time, in IOI'2010 held at the University of Waterloo there was something for the observers waiting outside for long 5 hours about performance of their team members. Whereas in sports performance of contestants are not only known to contestants but also to spectators for their enjoyment. Our inability of making the science-based contests more entertaining to spectators has resulted in making it difficult to organize science events due to absence of sponsorship even from technology-driven companies who would prefer spending their money to areas other than science. Science exhibitions and science week events appear much more thrilling for students with the presence of an entertainer or sportsman and not with the presence of a scientist. Students and young people, who will be earning their livelihood in the name of science, find sports people and entertainers more attractive than people who excel in their own professions. This has resulted not because these young people have wrong attitude rather because the whole society has been ignoring science workers to a level that it is extremely difficult to imagine that knowledge workers could be role models for young people. Scientists are often recognized at the national level with medals that possibly may not have any monetary value, although we do not fail

to recognize best cooks or even pickle makers with sizable cash prizes, as we do to accomplishment in other non-academic fields. It seems society feels scientists are priests, should be happy with fragrance less flowers and do not have any earthly needs to fulfill whereas achievers of any other field should be worshipped with flowers of fragrance and excessive money.

Popularity of sports is drawn from the fact that good performance is profusely rewarded. Performance is recorded, analyzed and grouped in many ways for the consumption of common people, and internet is overburdened with statistics of excessive orders. The information is readily available to people of all strata. Moreover, quiz competitions are organized that force these statistics and facts to be memorized by young people. Good performances in sports is so adequately rewarded that in a flash of a second the achiever becomes a hero and popular among common mass. The same is not true in case of academic competitions. We have not been able to popularize academic competitions even in the academia. I cannot be sure whether in any country we have recorded feats of meritorious students excelling in public examinations. Say in Bangladesh we used to evaluate exam papers on physics, mathematics or any other subject of our post grade 10 public examinations for some forty years. Nobody knows even the maximum marks obtained in a subject where some 200,000 to nearly 2 million students sat for the exam not to speak of other records. The students, who obtained highest marks during the 40 year period of exams in each year, are definitely gifted with praiseworthy aptitude in the relevant subject. Unfortunately examination authorities failed to appreciate the feat, and failed to inspire other students with this feat and possibly failed to create challenge in young people to beat the records. This feat in academic competitions is a lot more reliable than that in any other field where degree of uncertainty is much more than that in any conceivable academic competitions. For example, in a game like cricket a good batsman can score a double century in the first innings followed by a duck in the second one. Such variation is inconceivable in education. In sports like cricket we talk about records in the second innings or that of the 4th wicket. Can we imagine the corresponding statistics in the academic field? How many universities and departments having world class reputation can claim to have records of performance of students in various disciplines and in different combinations? Recently in the age of IT, ACM ICPC (baylor.edu, n.d.) is finding it extremely difficult to find names of teams that excelled or became world champions in early days of this competition – that too not of distant old days but as recent as 1978. We have immeasurably failed in recording the list of world champions. Can we name a form of sports in which we have failed to record the names? We have invented information technology and failed immeasurably to use this technology to the benefit and flourishing of our field, whereas people of other fields are using it to their advantage.

3. What is to be Done?

Sports organizers and people in entertainment are highly successful in popularizing their events amongst common mass. However, involvement of large sums of money contrib-

utes to its popularity. If football and cricket players would have received 100 times less money than they are getting now these events would have lost its glamour, and would not have received this much popularity. If winning Wimbledon title is a feat that can be recognized by giving a prize money of over two million pounds (Wimbledon, 2023), how much should the winning team of ACM ICPC or the champion of IOI team receive? Is the later a lesser feat than the former one? In cricket even cracking a board placed out of the field by a flying ball is rewarded with monetary prizes. Organizers of games and entertainment programs are very successful in attracting CEOs of large enterprises to perform their corporate social responsibility through promoting and sponsoring their events. Academic administrators should also be able to inspire and convince knowledgeable CEOs to invest their resources towards academic events like Olympiads, programming contests and other events that will sharpen and enrich skill of young people that will move the civilization forward. Personalities like Alfred Nobel (Nobel Prize) (nobelprize.org, n.d.) and John Charles Fields (Field's medal) (Wikipedia, 2024) have done it. Recently Clay Mathematics Institute initiated Millennium award, and the result was immediately visible. The Russian mathematician Grigorii Perelman (Clay Mathematics Institute, 2024) solved the long standing Poincare Conjecture, although opted out of taking million dollar prize money possibly expressing sheer unhappiness against the indifferent attitude of the society to academic feats. In the past different scientific societies used to inspire academic and research excellence, if properly motivated, leadership of industries will come forward to help promote academic events. In order to arouse interest of the common mass events around these academic activities should be publicized over all possible media both electronic and printing. Moreover, interesting statistics related to these events should be made easily available to concerned people as sporting statistics are.

4. Events around Academic Activities

So if we want academic events to gain popularity we must create events around it. For example, International Collegiate Programming Contest was first televised at Stockholm creating a lot of thrill as to which teams are getting winning positions. First solution of a particular problem was awarded. In this way fastest solution time can also be awarded. Once upon a time it was difficult to believe that common people will be watching as boring a mental sport as chess is. Fortunately, even this sport with insignificant body movement could be made popular by televising it. Academic competitions should be opened for public enjoyment without first taking it for granted that there will be no interest among common mass to these mentally seriously involved games. Olympiads and programming contests should be publicized in mass media to attract attention of common mass so that they can appreciate commendable aptitudes of contestants in these events. International Olympiad in Informatics, International Physics Olympiad, International Mathematics Olympiad should be shown on TVs to inspire young people and find their heroes in the winners of these prestigious events. Achievements in this

area should be duly recognized and rewarded to inspire young people's interest in aptitude and skill building. Leaders and enthusiasts of programming contests had to survive the ignorance of the results of International Olympiad in Informatics until IOI2010 organizers decided in favor of spectators and made a scoreboard available for them in the same spirit as it is being done in ICPC World Finals. I am sure it was enjoyable to well-wishers of programming contests. How can a game be played with both spectators and players kept in complete darkness as to the results? We should begin to think how excellence in all our academic activities can be enjoyed not only by people of the field but by people at large.

5. Conclusion

Human beings are supreme among all creatures not because they have superior organs like legs, arms, body, ears or eyes. In fact we do not have any superiority in these limbs. Usain Bolt will find himself in hopeless condition running a race against a feverish leopard, nor the strongest of human beings will be comparable to an elephant in strength. Human beings are superior in their brain power to any other animal on earth. For development of each limb we need to do exercise. This is also true in case of development of brain for which exercise is thinking for solving problems. While exercise can only improve capacity of each of our organs only by a finite times say 2, 3 or 4, capacity of brain power can be improved a thousand fold. For a country like Bangladesh the only surplus is population which can be developed into human resources through exercise of their brains. This can be cost effectively done with the introduction of healthy competitions with lucrative prize money to attract the young people of the country.

We must find ways and means to bring academic competitions to common mass, arouse their interest in these competitions and possibly make all sorts of statistics available especially to young people in order to create avenues for them to excel in their knowledge. We should look for support of mass media so that information of academic events gain popularity in our society, and achievers get a better visibility in our society and the future generation does not opt for other areas of activities whence they have the required aptitude and due recognition in the society. Leaders of our nations should be convinced of the usefulness of duly recognizing scientific feats and adequately rewarding them so that science and technology are not thought of as neglected areas of human endeavors.

This paper is attempting to initiate a discussion on the matter that there must be very lucrative incentives for science workers to pursue science. Knowledge in every field of science is growing exponentially. Possibly 2000 years back the whole knowledge of physics could have been packed in a single volume. Now it will require a thousand volume, and a science worker with a limited longevity will have to surf in a vast ocean of knowledge to find avenues for its progress, if he is at all lucky to find. Should not we make science working full of incentives for young people to pursue?

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