Y790-32707 - Assignment 6: Data Commentary

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Table 14 shows the country rankings for publications in Elsevier Journals between 1996 and 2010. As can be seen, United States (US) not only produces more than one fourth of the total scientific information produced, but also seems to be leading the overall scientific progress, judging by the first glance to the total citations of its publications and the substantial difference with the second country in each category. One other notable observation is that China and Japan have rather low citations per publication rankings, even though they have substantially higher number of publications. This, being also relatively true for countries like India and Russian Federation, may suggest that those countries have large number of studies with smaller interest groups like culture related social fields such as anthropology or linguistics. On the other hand, a high citations per document rank for a country may indicate a high number of studies in hard sciences such as physics or computer science. However, neither the number of publications nor the citations per document could indicate the overall productivity or influence of a country to the overall scientific progress. Because a closer look reveals for instance, US has more than %45 of its total citations coming from the publications produced in the US, while Austria and Singapore, ranked as 23th and 32th respectively, has more than %85 of their citations coming from the publications that are produced outside. This however, doesn't suggest that Austria or Singapore has more leading power in overall scientific progress than US, because the productivity itself is not a factor in this data. The data needs to be normalized by the number of researchers in the countries, in order to make it easier to deduce the level of productivity of an individual country by considering only the number of publications or h-index. The h-index in particular is designed as an attempt to measure both the productivity and impact of the studies of an individual scientist, by taking into account the number of publications and the number of citations per publication. However, without a normalization, it's natural to expect a higher h-index from a large group of researchers than a smaller one. Additionally, it's a known fact that the h-index can be manipulated by the self-citations, which in turn suggests that a higher h-index is not a strong indication of productivity or impact of a country that has a high self-citation percentage. Furthermore, a clear comparison of countries in the sense of productivity and impact requires a more clear data layout that for instance makes it explicit the criteria for which the countries are sorted. For instance, China(2nd) is placed above UK(3rd), which may only be attributed to the number of publications. However, the sorting clearly doesn't depend solely on the number of documents, as can be seen from UK and Japan, which are ranked as 3rd and 4th respectively, even though Japan has %1.5 more citable documents than UK. Overall, the one solid fact still remains, which is that a single country has a strong monopoly on the scientific development, even though the deficiencies described above are eliminated. As it may be related to political and social reasons, I believe that it is also related to the lack of a conventional sense of working together. Therefore the progress seems likely to remain a monopoly until the scientific community around the globe establishes a strong sense of collaboration.