

Primary and secondary education syllabus to be revised based on the current Science & Technology requirements of SDGs

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Abstract

Time for the policymakers to look at the existing education systems and syllabus once again in the limelight of UN SDGs vision 2030 and bound because of rapidly developments and new technological innovations in the world. A list of modern sciences with its technological features is getting long daily bases, which need to be incorporated into the basic education systems. Communities equipped with the latest knowledge in the early stages of the revolutions are enjoying healthy, safer, and more resilient societies and this creates considerable difference compared to outdated and less prepared communities. A uniform reforms-based campaign globally can be part of the meeting agenda for the subject when world leaders are sitting together.

Introduction

The importance of the syllabus – curriculum revisions for primary and secondary education is being addressed in this study by highlighting ongoing science and technology innovations in communities. SDG 4 – quality education having the targets for primary and secondary education with quality to maintain as features. A science and technology-based revised syllabus – road map is the only way to achieve quality education – SDG 4. outdated syllabus will never provide UpToDate community members. It is an ongoing process that requires collaboration and continuous improvement. It is essential to ensure that the syllabus is relevant, up to date and aligns with the current demands and future needs of society. The revision of the primary and secondary education syllabus to incorporate current Science and Technology is a need toward the progress of Sustainable Development Goals (SDGs). It is a multi-dimensional process that involves various stakeholders.

Outdated guidelines and syllabus for basic education level are huge challenges for the leaders to mitigate due to the lack of legislation, policies, financial matters, training for teachers, social norms, etc. Primary and secondary education is a basic level that lasts a long human life, quality educational guidelines for schooling are required with the latest knowledge which needs to be embedded in the syllabus so that clear concepts of ideology will be delivered during very early stages in the learning life.

Communities equipped with the latest knowledge, have a deep striving reliance power to sustain and help others to go on. Some countries are wise and give full attention to quality education by updating the education system according to the latest research and

development, and some need assistance to adopt the best practice. The best decision for education today will have extraordinary benefits for future challenges.

The best educational systems frameworks can be shared with others who desperately need them, and then policymakers can alter them as per their social and economic norms.

Despite advancements are happening worldwide to achieve the best SDG index, but progress for SDG 4 needs more action while mapping the gaps and making multi-tire programs and plans for the SDGs targets and its indicators.

Overall, revising the primary and secondary education syllabus based on the current science and technology requirements of the SDGs is essential for preparing the next generation of problem-solvers and critical thinkers who can contribute to a sustainable future.

Keywords:

Primary and secondary education, Science & Technology, UN 2030 SDGs, benchmarks.

Literature Review

To learn for the study support literature, some global-level stakeholders and some sophisticated published peer review papers were found to be helpful to consider in the discussion.

The World Bank Group (WBG) is the largest financier of education in the developing world, working in 90 countries and committed to helping them reach SDG4: access to inclusive and equitable quality education and lifelong learning opportunities for all by 2030[1]. Despite a diverse range of projects which are funded by The World Bank Group, and its database showing several indicators through the reports, it is still

struggling situation to find WBG data focused on the revised syllabus related to the primary and secondary levels of educational projects.

However, published article [2] is showing UNESCO commitment for the urgent renewing for basic education in the field of science. "Declaration on Science and the Use of Scientific Knowledge," adopted at the World Conference on Science held in Budapest in 1999. In these terms: "It is urgent to renew, expand, and diversify the basic education for all in the field of science, emphasizing the skills and scientific and technological knowledge to participate meaningfully in the society of the future" (UNESCO, 1999).[2]

In the published literature, it is found that "When children in the UK first experience formal science lessons, usually at the age of 5 years, the topics taught are not unfamiliar to them. Since the introduction of a National Curriculum for England and Wales, primary school children are now required to study Experimental and Investigative Science, which includes Life Processes and Living Things, Materials and their Properties, and Physical Processes (headings taken from the Key Stage 1 programme of study). Therefore, primary science lessons are likely to be based on the effects of physical forces such as pushing and pulling, how plants and humans grow, or how various objects sink, or balance. All of these are concepts that the children will have previously experienced in some form in their daily lives. And these experiences will have left their trace since from them the children will have constructed a number of intuitive ideas and theories about how the world around them works (Kuhn, 1989) [3].

While developing syllabus revisions, the following questionnaires were found in published literature as a preferred research method to gain more reliable feedback from teachers as stakeholders.

1. What are science and technology teachers' views of congruence between the goals of primary school science and technology course and the new curriculum?
2. What are science and technology teachers' views of changes in the teaching-learning process proposed by the new curriculum?
3. What are science and technology teachers' views of changes in the evaluation process proposed by the new curriculum? [4]

Integrated curricula are found published with this introduction: "Our society is filled with science and technology, and everyone needs at least a basic level of understanding of it (Osborne & Dillon, 2008). Many people work in jobs related to science and technology, and an ample workforce with suitable schooling in these subjects is needed. Therefore, the society needs to foster a positive student attitude toward science and technology (OECD, 2007; Rocard et al., 2007). However, students' attitudes toward science and technology appear poor in many cases (for an overview see Osborne, Simon, & Collins, 2003; Tytler & Osborne, 2012). [5]

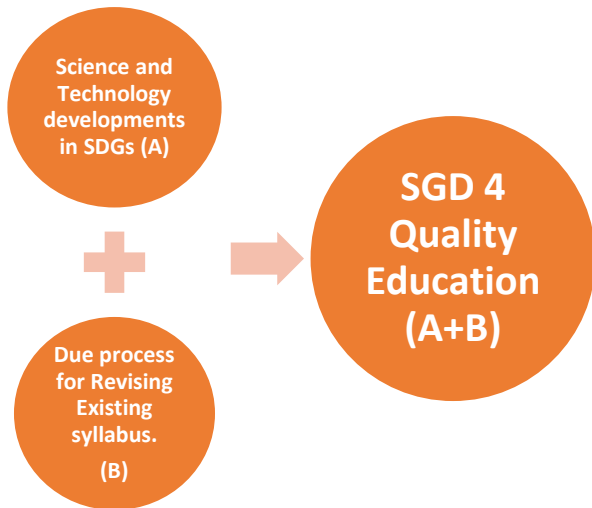
In the Netherlands, a large-scale project called the VTB Program (Broadening Technical Education in Primary Education) is designed to help primary schools integrate science and technology into their teaching. During a three-year period, schools receive financial, organizational, and subject-specific support to put this into practice. By the end of 2010, 2,500 primary schools (one third of the total number) will have embedded science and technology in their education with support from the VTB program and regional support desks. The knowledge, expertise, and experience developed and acquired by VTB schools will be made available to all primary schools in the Netherlands (see: <http://www.vtbprogramma.nl/home/over-vtb/about-programmevtb.html>). Although initiatives such as the VTB program have been reasonably effective, particularly where children's joy for science and technology projects is concerned, a major problem that cannot be solved simply by allocating more time to science and technology in primary education, is the fact that primary school teachers are not sufficiently trained to teach science and technology. International research (e.g., Palmer, 2004; Trumper, 1998) shows primary teachers' knowledge of science and technology and their attitudes toward science and technology to be generally low. [6]

Discussion

In the limelight of SDGs, it is an invitation to Public-Private partnerships to update the primary and secondary education syllabus to prepare the more resilient community members at the early stages of a life-learning cycle. Some important points are listed as related to the study.

A process model is illustrated for better understanding, which is explained too in some detail. This Model 1 process plan will merge with Model 2 for the executions.

Model 1: Self-Organized Process Plan for SGD 4.



1. Identify the relevant SDGs: The SDGs are a set of 17 goals adopted by the United Nations to achieve a more sustainable future. Review the 17 SDGs and identify which goals are relevant to the curriculum. For example, if there is revising a science syllabus, it may find that SDG 6 (Clean Water and Sanitation), SDG 13 (Climate Action), and SDG 15 (Life on Land) are relevant.

2 Project-funded organizations: Primary and secondary educational project - funded organizations must include the requirements to fulfil for updated syllabus containing latest science and technology development. [1,2]

3. Review existing curriculum: Review the existing curriculum and identify areas where the SDGs can be integrated. Consider how it can incorporate the related SDGs into existing lesson plans, activities, and assessments. [1,2]

4. Develop new content: Consider developing new content that focuses specifically on the SDGs. This could include

lesson plans, activities, and assessments that are designed to teach students about the goals and how they can be achieved.

5. Incorporate interdisciplinary learning: The SDGs are interconnected and require interdisciplinary approaches to address. Incorporate interdisciplinary learning into the curriculum by incorporating topics and themes from different subjects.

6. Engage students in active learning: Engage students in active learning by providing opportunities for them to learn through hands-on activities, discussions, and projects. Encourage students to take action and make a positive impact in their community by applying what they have learned about the SDGs.

7. Monitor progress: Monitor progress by assessing students' understanding of the SDGs and their ability to apply what they have learned in real-world situations. Track the impact of the revised syllabus on student learning outcomes and adjust the curriculum as needed.

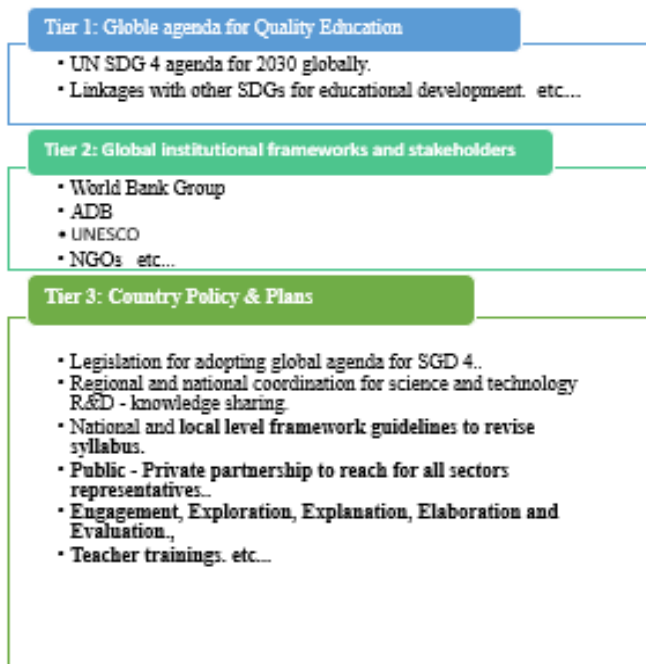
8. Teachers training and evaluations for the science and technology-based syllabus teaching in class. As we found in our literature review, sometime teacher's competency at the primary and secondary levels is found a challenge to cope with.

9. learning from the good study models in the region and establish good coordination to learn and share the best practice [6]

10. Public- private partnerships need to be carryon by the authority to make the point of feedback from the stakeholders from the community.

Three levels of the Tier model are prepared to support the study; this concept can be further researchable, and the study can enhance to a better level of saturation.

Model 2: Self-Organized 3 Tier level for the study.



Policy recommendations / conclusions

The World Bank Group will be encouraged to set the indicators to review the policy framework on papers and on ground, if gaps exist there should be clear guidelines to bridge the gaps. While funding for the primary and secondary educational projects, world bank groups must ensure a consistent, and a valuable syllabus revision framework is implemented and need for the primary and secondary education syllabus is going to full filled transparently as and when required.

World bank groups can make the arrangements to apply the filters in the database of indicators and countries to read reports for the last updated science and technology developments as a part of the primary and secondary educational syllabus.

The education minister and science and technology minister must conduct periodic reviews jointly at local, national, and international levels to synchronize the primary and secondary education study modules in the country. These types of data need to be present in the Voluntary National Reviews (VNR) of the country, and it should be considered for the SDG index position race. Teachers training and evaluation centers can be created to gauge the professional competency for the existing teachers and programs for the CPD as per the science and technology and related SDGs.

Learning modules and experimental activities for primary and secondary education to be developed by considering all related SDGs while revising the syllabus. A transparent and reliable survey and other independent feedback mechanisms.

Participation channels need to be open for participating all stakeholders while revising the syllabus at the primary and secondary level, which include but not limited to, parents, NGOs, teachers, students, cultural and socioeconomic and environment personnel.

Purely public-private partnerships for the science and technology-based syllabus for quality education in the primary and secondary education systems.

Ideally, the best concepts of the primary and secondary educations syllabus can be shared with other partner states, if possible, with funding support including training support, etc.

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