Secondary Education in Ethiopia: A Comprehensive Summary

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ABSTRACT

The article presents clear picture of the secondary school curriculum of Ethiopia from its planning to its implementation and the different problems faced during implementation by suggesting the solution so as to bring an all rounded development of students. Besides this it also indicated important points/recommendations for developers as well as practitioners of the curriculum. So it is advisable to take the comments in to consideration and revise and implement the revised curriculum as suggested by the authors.

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Introduction
This paper is a comprehensive summary of the Secondary Education in Ethiopia: Supporting Growth and Transformation written by Verspoor and Dhoj Joshi (2013). It includes current curriculum, International Trends in Curriculum Reform, Priorities of Ethiopian Curriculum Reform, Conclusion and Reflections.

Current Curriculum
The authors indicated that the general secondary curriculum in Ethiopia was not designed with universal access in mind rather it is academically demanding and closely tied to university entry requirements. Such a curriculum is no longer appropriate because universal secondary education requires a much wider range of abilities and aspirations. To provide all students the opportunity to succeed and develop the human resources for a rapidly growing economy, the curriculum should give priority to content differentiation. Supporting this (UNESCO, 2004) suggests that in order to be fair to our students and facilitate learning of all students, we need to adapt or modify the curriculum so it “fits” the students’ learning needs. Teachers differentiate the curriculum so they do not discriminate and teach to only a selected group of students (i.e., only those students who are at, or near, year (grade) or age level ability in the prescribed curriculum). Teachers offer students a variety of learning experiences to meet their different learning needs.

This change would allow students to study subjects at different levels of depth and choose electives that prepare them for different career. The authors further suggested that secondary education differentiation should start in grades 9-10 and become increasingly pronounced in grades 11-12, in order to prepare some students for university entrance, technical and vocational education and others for the world of work. In addition, curriculum content needs to be relevant to a labor market where metacognitive skills are at premium. Schools should also provide flexibility to create instructional environment suited to local conditions. In relation to this, (Gibson, 2010) recommends that the conditions for optimal learning include both physical and psychological elements. A flexible classroom layout is key, incorporating various types of furniture and arrangements to support both individual and group work. Psychologically speaking, teachers should use classroom management techniques that support a safe and supportive learning environment.

The authors further explained that the curriculum is not designed to meet the demands of students who are not destined for higher education. Besides this it is overly costly. It is concluded that the Ethiopian curriculum is difficult and highly academic compared to most other countries, even those where teaching is in students’ mother tongue. Hence, the poor performance of Ethiopian students on the national examination and National Learning Assessment for grade 10 is perhaps therefore unsurprising.

The difficulty of the academic content of the Ethiopian curriculum is exacerbated by the switch to English as the medium of instruction in grade 9 because the English language competency of both teachers and students remains limited. In relation to this, I have also observed that in the summer course program when I was teaching “secondary school curriculum and instruction” for secondary school English teachers most of them were not able to express themselves and even some of them are not able to construct sentences which clearly shows their limited language skill.

The authors indicated that the curriculum is not designed for universal education by emphasizing that the Ethiopian secondary education curriculum remains essentially “one-size-fits-all” with the “size” designed to fit more academic learners best and does not consider individual differences between learners become increasingly significant and problematic as students grow older. This has
become a problem because instruction is not always tailored to meet individual student’s needs. Because teachers are challenged with classrooms of students with mixed abilities, varied instructional strategies are necessary to meet the needs of all students (struggling and advanced) to allow students access to the curriculum (Trilling & Fadel, 2009). This can tell us that the design of curriculum and instruction should consider the learning needs of students so as to meet the curriculum to their level of understanding but the case becomes different in Ethiopia as the authors underlined the problem. The authors recommended that a universal education curriculum must accommodate those differences, it must be learner centered rather than subject centered and incorporate strategies to cope with differences in learners’ needs. It must neither brand slower learners failures, nor put a brake on the progress of the most able. Progress in this direction will require dealing with the issues of overload, misplaced topics, learning gaps, and repetition. Let’s see each of them one by one.

**Overload**

Here the authors indicated that it is easy to add elements to a curriculum, but very difficult to remove them. As a consequence, all curricula tend to become sclerotic (and increasingly dull) over time because of the pressure to add new elements. Many examples from the Ethiopian science syllabi typify how this “overload” has arisen over time. First, many topics that have long since disappeared from school curricula elsewhere remain in the syllabi, despite revisions. Second, many topics (particularly in physics) are covered in much greater detail than is required for an understanding of a given concept, leaving the learner “unable to see the forest for the trees.” The syllabi also tend to be over prescriptive, thus becoming work plans rather than curricula. This indicates that the curriculum developed is more difficult and beyond the level of the learners. In relation to this I have practically observed the physics text book for grade 11 when my daughters were worrying about the volume and the difficulty of presentation of the exercises and examples given in the textbook. In this case maturational theory of learning emphasizes that the curriculum should be designed in line with the maturity level of development of learners. Children are expected to exhibit certain behaviors according to a maturational timetable. This can be very helpful for parents and educators to see a list of normative behavior for children at a specific age (Gesell, 1928). Hence, the curriculum needs to be developed by considering the maturity level of learners so as to attain the expected out comes.

**Repetition**

The authors indicated that while it is educationally desirable that learning area curricula be spiral in nature, this design can result in a more detailed treatment of a topic when it is first introduced than is either appropriate or desirable (except perhaps for the most able learners)—a trend very evident in Ethiopian science subjects. This shows that the Ethiopian curriculum lacks proper sequence in a spiral nature where concepts need to be presented from simple to complex in an increasing order of difficulty without mere repetition. Curriculum should be designed to allow for flexibility in modifying activities to meet the individual learning styles, abilities, and interests of each child.

**Misplaced topics**

In this case the authors indicated that the conceptual demands of a curriculum and the conceptual ability of intended learners should match, but in Ethiopia this is often not the case. The grade 10 curriculum, for example, contains abstract topics that make demands on learners that would not normally be made until grade 11 or 12 in many developed countries, and then only in the academic stream of upper secondary education. The authors further explained that this is a significant issue
throughout Africa, where curricula have been designed as selective tools to identify and encourage fast learners rather than as mechanisms to help the greatest number of students achieve the highest possible levels of numeracy.

In line with this (Shipley, 2014) suggested that while students are treated as unique individuals, all practices should be appropriate to the child’s age and developmental stage and build on previously taught concepts. Hence, the design of curriculum should be in line with the maturity level of children so as to enable them to understand the concepts appropriately. Shipley (2014) added that the curriculum should be developmentally appropriate for meeting the students at the developmental stage they are currently and enabling them to reach goals that are set for them. A curriculum designed considering the developmental stage of learners reduces learning gaps, increases achievement for all children, and allows students to share and engage in the learning process while they solve their own problems as they learn new information (Copple & Bredekamp, 2009).

**Emerging gaps**

The authors described that curriculum development is a dynamic process that needs to keep up with new knowledge areas and emerging demands for skills and competencies. While secondary curricula in Ethiopia are being revised in five-year cycles, they have not always been able to keep up with rapid changes in science, technology, and the economy. In the process of curriculum change and revision, Purpel (1972) proposed that the primary responsibility for the child’s learning was historically determined by the parent, but as society became more complex, the needs for specialized training grew, necessitating more formal training. It is obvious, therefore, that the curriculum must meet the needs and current demands of the culture, the society, and the expectations of the population being served. To this end, the educational reform process is still undergoing review, revision, and constant change. Accepting that changing an educational curriculum can be a challenge, the involvement of all stakeholders, especially individuals who are directly involved in student instruction, is an especially vital piece in successful curriculum revision. But in the case of our country, the process of curriculum revision is not considering the societal changes and does not participate the concerned bodies as the authors described. Hence, when curriculum is revised it should consider rapid changes in science, technology, and the economy of the country in order to bring the expected development of the nation and make the learners fit with the demands of society and to prepare a workforce for the 21st century. Achieving effective curriculum revision, therefore, requires a thorough understanding of the processes and principles of the changing paradigms affecting curriculum development. Ongoing observation and assessment is crucial to meeting the constantly changing needs of young children.

**Technology**

In relation to this the authors explained that the issue of technology in the curriculum is very much under debate internationally (see, for example, Fensham 2008) and a variety of possible avenues are emerging. These alternatives involve both changes within traditional subjects, particularly science, and the introduction of new subjects, such as entrepreneurship. Similarly, mechanisms to guide students toward career choices and further training remain underdeveloped in the country. In line with this it is possible to say that in the modernized educational capabilities of today, technology is opening new doors of learning with every student. With each innovation, the limits for learning are continuously raised, and the design of curriculum reflects the expanding possibilities created through technology. The curriculum must evolve to meet the changing needs of students and employers. It must change to

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reflect new needs, new audiences and new approaches to learning. Moreover, the use of technology as part of the curriculum design process can help to:

- develop new solutions to address organizational, technical and educational issues
- communicate in new ways with stakeholders to facilitate discussion and collaboration
- access, record and capture information to inform curriculum design
- improve access to guidance for those designing and describing curricula
- model, test and refine new approaches in curriculum design

But the actual use of technology in the context of Ethiopia is poor as the authors stated. I have also practically observed that the use of technology is not capable of developing the skills of students because the teaching method is not practice based. The plasma instruction can be taken as an example in that it was blamed as the Ministry of Education (MoE) cites a number of reasons for the inability of the plasma program to influence learning outcomes:

- The language level is too difficult
- The lessons proceed too quickly.
- Interaction is not possible.
- Teachers have little time to discuss lesson points with their students.
- Learning is passive.

Moreover, as teachers cannot view lessons prior to broadcast, they are unable to integrate them into their own programs. This in turn undermines their authority. The MOE concept paper on mathematics and science teaching concludes that the problem lies, in the main, not with the technology, but with the way in which it is used. In addition the authors listed other reasons for the failure of the plasma program such as it was not driven by demand. Instead it was thrust on a reluctant teaching force; unfortunately, it does not easily integrate with normal teaching styles based on textbooks. Teachers have had little or no training in how to make the best use of the program, which leads to insecurity because they feel that they are not in full control. In order to solve such problems it is advisable to provide prior training for teachers, aware the teachers that plasma is a supportive not a process of instruction by itself.

High cost

Here the authors noted that Ethiopia has a high-cost secondary curriculum. Worldwide, the sciences and humanities, for example, are increasingly being taught as single subjects up to grade 9 or 10, particularly to lower-ability children. This change has been driven, in the main, not by economic but by pedagogical and epistemological factors that emphasize the essential unity of a learning area. In this case I disagree with the teaching of sciences and humanities as single subject particularly to lower-ability children because children at lower level are expected to be taught in an integrated manner rather than teaching them separate or single subjects. In relation to this many learning theorists suggested that children at lower level are better taught in an integrated manner because their cognitive development is low and are not able to understand concepts in a separate/ single subject/. In addition, their skill of classification is too low since they better understand concepts in a comprehensive and integrated manner than in a separate form.

International Trends in Curriculum Reform

Here the authors identified two broad waves of educational reform namely to place the child, rather than the teacher, at the center of all education activities and the emphasis of education toward educational equality and the goals of the Education for All movement. In the first case even though the child is placed at the center of education, the teacher remained in full control of the teaching learning process. It was influenced primarily by the need to increase the pool of high level expertise in the labor force. It also tended to focus on
superior academic achievement (Ware, 1992). The current Ethiopian curriculum is a characteristic product of this wave of reform.

Some 30 years later, the emphasis of education was shifted toward educational equality and the goals of the Education for All movement. The shift continued the process of handing responsibility for learning from the teacher to the learner. It was in part driven by a change in pedagogical emphasis from Piagetian interpretations of the learning process toward more constructivist interpretations, which tend to support the view that Education for All is an achievable goal. The essentials of both have, of course, been around for centuries and sound educational reformers are careful to emphasize that new ideas should build on, and not displace, the best of an existing education system.

The second wave of reform initially focused on primary education, but has evolved to include basic education of a 9–10-year duration. These second-wave changes have had important consequences for the purposes of curricula and assessment; they have also made keeping students in school a key priority.

Table 4.3 Some Characteristics of Curriculum Reform, 1960s–2010s

<table>
<thead>
<tr>
<th>No</th>
<th>First wave</th>
<th>Second wave</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Preparation for a career or higher education</td>
<td>Education for All</td>
</tr>
<tr>
<td>2</td>
<td>Focus on understanding</td>
<td>Focus on skills as well as understanding</td>
</tr>
<tr>
<td>3</td>
<td>Acquisition of knowledge</td>
<td>Application of knowledge</td>
</tr>
<tr>
<td>4</td>
<td>Broad coverage of detailed content</td>
<td>Less content, making for more effective learning</td>
</tr>
<tr>
<td>5</td>
<td>Mastery of subject content</td>
<td>Ownership of content</td>
</tr>
<tr>
<td>6</td>
<td>Teacher as originator of knowledge</td>
<td>Teacher as manager of learning process</td>
</tr>
<tr>
<td>7</td>
<td>Whole class working as a unit</td>
<td>Individual or group work</td>
</tr>
<tr>
<td>8</td>
<td>Examinations select students for a higher level</td>
<td>Examination provide a certification</td>
</tr>
<tr>
<td>9</td>
<td>Exclusive: pass and fail are important concepts</td>
<td>Inclusive: pass and fail cease to exist</td>
</tr>
<tr>
<td>10</td>
<td>Curriculum is subject centered</td>
<td>Curriculum is learner centered</td>
</tr>
</tbody>
</table>

From the above table it is possible to understand that the second wave characteristics of curriculum reform indicates a curriculum which is more learner-centered and inclusive that allows learners to construct their own meaning as far as the idea of constructivism is concerned.

Features of the second wave of curriculum change

Purposes of the curriculum

According to the authors the second wave of the curriculum change was focused on the following.

- The concept of pass and fail ceases to exist and all learners emerge with some kind of certification, the systems are inclusive students.
- The curriculum is learner-centered to allow learners to proceed at a speed determined not only by subject content but their own attitude.

Purpose of Assessment

Changes in the purposes of education must be accompanied by changes in objectives of assessment.
The authors explained that a recurrent complaint of higher education teachers in Ethiopia is that the students leave grade 12 with underdeveloped skills and limited ability to apply what they have learned to novel situations. The current Ethiopian curriculum does not indicate assessment objectives in an adequate way.

But in principle, the assessment of students should to measure all aspects (skills, attitude, and understanding abilities of students.

In addition, as the authors indicated the test scores in physics and chemistry (94% and 90%) respectively were based on questions that tested knowledge and understanding. Hence, the next curriculum revision needs to include objectives of assessment in a comprehensive manner.

Keeping students in the system

The authors suggested that repetition practices should gradually be replaced by inclusive practices in which, increasingly learning difficulties are diagnosed early. Reducing in dropouts rates should become a significant indicator. A key element in reducing this rate is inclusive based policy that addresses issues like advice and support particularly for girls who are in danger of dropping out. The other is designing advices and support system that ensures schools are made aware of any social or academic difficulties experienced by their students.

Priorities of Ethiopian Curriculum

The authors suggested that the main priority of the next curriculum revision must be to meet the needs and aspirations of all secondary school aged youngsters including those who need extra support in learning, those who will leave secondary education to enter the job market with or without technical training and those who have the potential to reach the very highest levels of academic achievement.

The authors further suggested that achieving these goals necessitates a number of decisions at the policy as well as technical level. The most important goals of the future curriculum revision as suggested by the authors should be to:

- Ensure an enabling environment
- Redefine the purpose of the curriculum for successful learning
- Adapt assessment and examination systems
- Provide opportunities for students to develop metacognitive skills
- Use ICT to improve teaching
- Ensure equitable access to the curriculum for girls and ethnic minorities
- Make the curriculum more cost effective

Ensuring an Enabling Environment

Here the authors suggested that certain minimum conditions that enable learning should in place such as competent teachers, sufficient textbooks and other instructional materials, and an adequate number of classrooms.

Improving student academic performance will require that teachers continuously improve their own subject matter and pedagogical content knowledge as well as English Language Competency.

In relation to textbooks, the next round of secondary curriculum revision is expected to focus on flexibility and differentiation thought must be given to how the curriculum strategy can be reflected in textbooks and how these textbooks can be made accessible to students with a limited mastery of English.

Teacher training institutions should be in the forefront of such development and provide their trainees both the knowledge of how to use ICT effectively and the skills to do so.

Lower-cost design and construction are essential, given the number of new places needed in Ethiopia by developing strategies for a more intensive use of buildings such as double-shift use of buildings extending existing primary schools rather than building new secondary schools were suggested by the authors as important ways to minimize cost.
In addition, community involvement in the development of educational infrastructure can play a significant role in controlling costs. In general it is possible to conclude that fundraising campaigns and efforts to promote volunteerism may increase resources and improve classroom support, but these efforts will have little if any impact on improving student learning. Carter (2003) and LOWA (2007) state: the evidence is now beyond dispute; when schools work together with families to support learning, children tend to succeed not just in school, but throughout life. Hence, family involvement significantly contributes to improved student outcomes and fulfilling the infrastructure of schools.

**Redefining the Purpose of the Curriculum**

In relation to this the authors suggested that to achieve progress toward universal general secondary education and successful learning on the part of all students a number of issues such as the difficulty of Grade 9-12 curricula must be addressed. Hence, flexibility and differentiation need to be introduced in the curriculum, the purpose of grade 11 and 12 should be considered with redefinition of the curriculum, an evolving qualification framework is needed for the changing TVET system need to be adjusted to respond to the aspirations and competencies of students.

**Adapting Assessment and Examination Systems**

Concerning this the authors described that curriculum change, and assessment and examination change need to go hand in hand. Moving toward standard-based assessments and examinations, shifting from selection to verification and changing a system that tests predominantly only recall to a system that increasingly tests higher order thinking.

**Developing Metacognitive Skills**

Metacognition refers to learners’ awareness of their own knowledge, that is, their ability to assess their knowledge, identify gaps in it, address these gaps, and, generally, control their own cognitive processes. The curricula at both the general secondary and preparatory level must lay foundations for and promote lifelong learning which will improve graduates’ skills and continued employability. Lifelong learning is expressed as “…a continuously supportive process which stimulates and empowers individuals to acquire all the knowledge, values, skills and understanding that they will require throughout their lifetimes and to apply them with confidence, creativity and enjoyment in all roles, circumstances, and environments (Kearns, 1998, cited in McKenzie, 2001). Hence, in this context, every child and young person is entitled to develop skills for learning, skills for life and skills for work, with a continuous focus on literacy and numeracy and health and wellbeing. Therefore, the curriculum should support all children and young people in developing skills which they will use throughout their life and in their work, including the development of pre-vocational, enterprising and employability skills, personal skills, high levels of cognitive skills and the opportunity to put learning into a practical context.

In the context of Ethiopia the authors indicated that the skills in curricula and teaching methodology are simple to describe but difficult to translate into curriculum elements, it is even more difficult to translate metacognitive skill requirements from the curriculum to classroom activities. Many elements are already present in some form in the intended Ethiopian secondary curriculum; however, there is little focus on these elements in the existing intended curriculum and they are almost entirely absent from the implemented curriculum (the distinction between the intended and implemented curriculum is well known.)

The authors suggested examples of curriculum elements that promote metacognition such as reading meaningfully, learning how to learn, communal activities that lead to more effective learning, real understanding, cognitive
restructuring and information retrieval skills. But contrary to this the authors indicated that the existing curricula in Ethiopia promote the learning of factual data rather than the understanding of underlying concepts, leaving learners little or no time to practice or develop metacognitive skills. Crucially, examinations in the country must reduce their emphasis on simple recall in favor of testing the ability to apply knowledge to new situations.

**Using ICT to Improve Teaching, Learning, and ICT Skills**

ICT in schools is commonly used to support teaching and learning, teach ICT skills, and improve the efficiency of educational planning and administration.

**Improving Teaching and Learning**

Here the authors explained that ICT developments in education throughout the world, such as the Ethiopia plasma TV program described earlier, have been largely driven by technology. ICT projects are done because they can be done, not because evidence indicates that they will improve learning or there is established demand for them. The most important lesson here is that for any education technology program to be effective, it must respond to demand. However, long experience with education technology demonstrates that creating this demand is not a simple matter.

The authors further added that a useful way to encourage the use of ICT in teaching is to provide lists of possible “ICT opportunities” in curriculum documents, particularly in sample work plans. In relation to this the use of technology is emphasized as it can help to bring all the data together into one integrated system providing verifiable ‘single truth’ data sources that can be interrogated in multiple ways to provide focused and timely information. But this development needs to be conceptualized as a long-term process that includes training and technical and pedagogical support to help teachers exploit the potential of ICT in instructional strategies.

**Teaching ICT Skills**

The authors described that using computers to teach ICT skills is the main educational application of ICT in Ethiopia. One issue of significance is the concept of a “computer lab.” As devices shrink in size, the conventional fixed computer lab (which has taken valuable space out of optimal use in many schools) is rapidly becoming archaic, except for courses that teach students how to use a keyboard.

The authors further suggested that to support the adoption of ICT in teaching and learning, all teachers should, as soon as possible, become computer literate. A minimum standard could be prescribed, but initially it should be very basic. Training programs should include use of existing TVs in teaching. More advanced uses of ICT in teaching and learning should be supported in a manner that is selective, intensive, and demand driven.

The authors underlined that although top-down mass promotion of ICT among teachers may be appealing, long experience in promoting the use of practical science facilities has shown that such an approach is largely ineffectual, and even counterproductive.

**Improving the Efficiency of Educational Planning and Administration**

The presence of computers and Internet connectivity is opening up opportunities to enhance the efficiency of educational administration, including planning and scheduling. Computers are increasingly used, for example, for school personnel and financial management, inventory, data collection, and analysis. At the school level, ICT can be used to compile individual student data (including learning achievement scores) and conduct school improvement planning, provided that links to local demographic data and a national education management information system have been established.
But as the authors explained as it is practically observed these data systems are not yet fully developed in Ethiopian schools, but as Internet connectivity spreads and teachers and administrators become computer literate, the use of ICT for planning and administration will expand rapidly.

**Improving Access to the Curriculum**

Affordable general secondary education in grades 9 and 10 must, of necessity, often be provided on a small local scale. This means that the curriculum must be sufficiently flexible in design to cater to the needs of a wide variety of sites, from schools with a few additional classrooms to rural primary schools to large urban schools. This type of design requires separating the details of what is taught (the curriculum) from how it should be taught (the work plan); what is taught will be common to all schools, how it is taught will depend on local circumstances. The authors suggested that the issue of “how to teach” is usually best addressed with work plans designed at the regional or school level, where variations in local context can best be identified.

It is obvious that students enter schools with different kinds of backgrounds and knowledge. Effective instruction connects to the local environment, culture, and language. As more students from rural areas and ethnic minorities enroll, these challenges will become increasingly important. In this case the curriculum needs to consider diversities of students which is emphasizing to the issue of multicultural education. In relation to this it is possible to say that the actions taken in schools to adopt multicultural education should reflect the race, language, ethnicity, habits, and customs of ethnic groups throughout the global community. In order to promote a comprehensive understanding of cultural groups, we must use a variety of methods and a composite of various areas of scholarship, including the humanities, arts, social sciences, history, politics, and sciences.

To verify this, the authors suggested that as the student body becomes more diverse, instructional strategies will also need to become differentiated. For example, girls often face special problems with regard to curriculum delivery, which has traditionally not taken into account differences in the way students learn and the biased messages conveyed by curriculum materials. A gender-responsive pedagogy that pays attention to the specific learning needs of girls and boys calls for teachers to embrace an all-encompassing gender approach to the processes of lesson planning, teaching, classroom management, and performance evaluation. Hence the authors suggested that curriculum materials should accordingly be designed to include positive role models for both genders and avoid stereotypes.

**Making the Curriculum more Cost Effective**

Making the curriculum more cost effective can contribute in important ways to reaching the goals that Ethiopia has set for itself. The cost of a curriculum is influenced by a number of factors, including the number of teachers required to teach it; the cost of learner materials, facilities, and equipment; efficient use of facilities; and the cost and effectiveness of the support system needed by teachers. The authors suggested the following cost-effective options for each of these areas:

**Number of Teachers**

A curriculum with a large number of different subjects requires more teachers than one with a just a few subjects. As the authors suggested the minimum number of teachers required to manage a curriculum can be lowered by using such strategies as:

- Ensuring that all teachers can teach at least two subjects, perhaps with major and minor qualifications (this requirement will be especially important as the system expands via small schools in rural areas)
- Reducing the number of subjects taught
• Increasing the number of grades that teachers teach

Combining the three physical sciences (biology, chemistry, and physics) and combining the humanities (history, geography, and civics) is now common practice in many countries worldwide for all students up to grade 9 or 10; often the practice continues at higher levels for students in less academically focused streams. Here I disagree with the idea of the authors for combining the subjects up to grade 9 or 10. Because it is at lower levels that integrating subjects could be advisable since the cognitive development of children is low and requires a comprehensiveness understanding of subjects rather than in a separate manner. But as students grow and mature and increase in grade levels teaching separate subjects could be advisable since the students' skills of separation and classification is a little bit developed.

Cost of Textbooks

The number of textbooks required is directly related to the number of subjects in a curriculum. The authors suggested that the new grade 9 and 10 science textbooks in Ethiopia are large and although individually cheap, their overall cost is still significant. Length is directly related to the way syllabi are constructed because authors are under an obligation to cover every point mentioned in a syllabus, however trivial.

On the other hand reducing the content of syllabi by removing much of the secondary illustrative material would give authors the freedom to cover the main concepts in an effective way without having to include material that they find unhelpful. Such reduction of the contents may lead the textbooks to miss important concepts which may lead the learners to have very limited understanding.

Cost of Teaching Science

Here the authors underlined that science subjects are often expensive to teach because they require practical work, which is conventionally interpreted as requiring elaborate laboratories and equipment. However, there is currently a global move away from expensive equipment for teaching science skills, particularly at the primary and lower secondary levels.

It is clear that the purpose of laboratory work is to improve understanding of science concepts by demonstrating them directly and to teach scientific skills. The latter requires little more than a room with a source of water and some basic equipment, while the equipment demands of the former depend directly on the requirements of the syllabus.

As noted earlier, the current Ethiopian science curriculum is heavily biased toward knowledge acquisition in the three traditional subject areas. As a result, it is expensive to teach well because the practical work required is intended to help students understand abstract concepts and requires expensive facilities and materials. From this it is possible to deduce that the teaching of science is very expensive and requires greater emphasis on skill acquisition is essential when revising the curriculum.

Cost-Effective Use of Space

The authors said that teachers tend to use few aids beyond those they can easily carry to a lesson. With the exception of science laboratories, few schools have departmental bases where teaching materials are kept and that are visited by learners. The authors suggested that an expanded curriculum, particularly one that places greater emphasis on skills and “learning by doing,” will make demands on both teaching and learning. These demands will be impossible to meet without the establishment of subject departments where materials can be kept and displays maintained, allowing for the development of student work environments that have an abundance of environmental, print, oral, and written language materials. In practice most teachers may use instructional materials when there are visits of classrooms by supervisors. As it is well known many schools do not have display rooms. In
addition even those available are not visited by most teachers. Hence, there is less utilization of spaces like computer laboratories and other facilities.

**Conclusion and Reflection**

Here the authors concluded that the educational transformation that must accompany Ethiopia’s progress toward a middle-income economy includes a revision of its general secondary and preparatory curricula. They further suggested that new curricula will need to provide to the needs of a much more diverse group of students and prepare them for participation in a more diverse, complex economy. These conditions suggest that content differentiation, relevance and flexibility in implementation are key priorities that need to be practiced in order to improve the curriculum. Each priority can be seen one by one as follows.

**Differentiation**

As the authors noted at the outset of their research, the current general secondary curriculum was not designed with universal access in mind. Comparative analysis suggests that the Ethiopian curriculum at this level is academically demanding and aligned mainly with the demands of university entrance. It may be appropriate for the most academically able students, who aim to continue their educations in preparatory and university programs. To provide all students the opportunity to succeed and develop the human resources for a rapidly growing economy, the curriculum should give priority to content differentiation. Supporting this (UNESCO,2004) suggests that in order to be fair to our students and facilitate learning of all students, we need to adapt or modify the curriculum so it “fits” the students’ learning needs. Teachers differentiate the curriculum so they do not discriminate and teach to only a selected group of students (i.e., only those students who are at, or near, year (grade) or age level ability in the prescribed curriculum). Teachers offer students a variety of learning experiences to meet their different learning needs.

The authors suggested that a “one-size-fits-all” curriculum will not enable students to learn to their maximum potential. At grade 9 the abilities and aspirations of students are already so diverse that teaching the same content to a single group of students—some academically gifted, others with more aptitude in applied subject matter—will not be in the interest of either. For this reason, the expansion of access to secondary education has been accompanied everywhere in the world by a differentiation in content that allows students to pursue specific interests and succeed at different levels. Supporting this Keatinge (1896:399) in Comenius indicated that “Besides, what need is there to begin with difficult passages? We can proceed step by step. First we should embark upon the Catechism, and then keep in shallow water by teaching Scripture history, moral sentences, and the like, that can be easily understood, but which at the same time lead to weightier matters follow. And finally, when our pupils are fit to it, we can introduce them to the mysteries of the Faith”.

From this one can understand that the curriculum developed should fit to the understanding level of students i.e., education should be given based on the developmental level of the learners which shows age appropriate curriculum so as to help students learn the concepts which in turn indicates the importance of curriculum differentiation where students are taught according to their physical, mental, social and emotional maturity. In addition, at the lower secondary level students typically study common core content. Differentiation occurs because students either elect to study subjects at different levels of depth or subjects that are not included in the core curriculum. But the case is not practical when we see the secondary school curriculum of Ethiopia. The authors recommended that a universal education
curriculum must accommodate those differences, it must be learner centered rather than subject centered and incorporate strategies to cope with differences in learners’ needs which indicates the significance of curriculum differentiation.

Relevance
As it is known relevance is the applicability and appropriateness of a curriculum to the needs, interests, aspirations and expectations of learners and society in general.

The second curriculum challenge in Ethiopia as the authors indicated is responding to the demands of a rapidly growing economy that uses increasingly complex methods of production (in industry and services, as well as in agriculture), which put a premium on metacognitive skills. This implies the need to:

• Emphasize instructional methods that promote and enhance metacognitive skills
• Prepare students for lifelong learning in a rapidly changing economy
• Recognize that preparation for the world of work will become a progressively more important objective of the secondary curriculum as an increasing number of students do not immediately pursue further education and training.
• Provide content that is aligned with the increasingly applied academic foundation requirements of TVET programs, including ICT skills.

In relation to instructional methods promoting metacognitive skills improving the quality and quantity of instruction provided in whole class or small group instruction is the purpose of differentiating instruction. In relation to this Schubert (1986) suggested that “the methodology may range from teaching students desirable changes that should be made equipping them with critical thinking abilities and a desire to ask and act on the question: what should be changed, how, and why?. This shows that the methodology used should be a way of teaching students to develop their critical thinking abilities by responding to questions why, how, that facilitates the development of their metacognitive skills. Then providing instruction which allow students to develop their metacognitive skills through the application of practical exercise is essential. Teaching is undergoing a dramatic shift as the nature of learning changes – that’s why we need teachers to be expert pedagogical designers, constantly refining the learning experiences for every child. And that is why we need a clear framework to guide teachers in their work.

Therefore, the presentation of the curriculum should be in line with the developmental level of children. In line with this (Shipley, 2014) suggested that while students are treated as unique individuals, all practices should be appropriate to the child’s age and developmental stage and build on previously taught concepts. Hence, the design of curriculum should be in line with the maturity level of children so as to enable them to understand the concepts appropriately. Shipley (2014) added that the curriculum should be developmentally appropriate for meeting the students at the developmental stage they are currently and enabling them to reach goals that are set for them. A curriculum designed considering the developmental stage of learners reduces learning gaps, increases achievement for all children, and allows students to share and engage in the learning process while they solve their own problems as they learn new information (Copple & Bredekamp, 2009).

Flexibility
The authors suggested that the real impact of curriculum change will be seen at the school level, where its success will ultimately be determined. In a country as vast as Ethiopia, schools operate in different environments, making a number of specific initiatives necessary. It is essential, for example, that the education system continues to intensify GEQIP efforts to promote effective instruction adapted
to local conditions. This implies that the curriculum designed should be in line with the schools condition allowing flexibility of practical implementation.

It is also possible to conclude that efforts are also needed to improve the teaching of mathematics, science, and IT. The emphasis in science should be on providing students the opportunity to carry out simple experiments, possibly using micro-equipment that can be used in ordinary classrooms in schools that do not have specialized facilities. For IT, it is important to review the effectiveness of the plasma program learning strategy and assess its longer-term potential in the light of emerging Internet-based, DVD, and mobile alternatives. In addition, flexibility in curriculum implementation should allow for the introduction of adequate local content, while avoiding the biases of stereotypes and employing a range of instructional strategies to reach girls and ethnic minorities. Finally, it is crucial to deliver equivalent content in small schools by means of a streamlined curriculum and flexible staffing arrangements. In line with this Immanuel Kant (1724-1804) suggested that curriculum adapted to students needs and abilities maintained that students should be free to pursue their interests as long as they did not impinge upon those of others. This indicates that the curriculum should be adapted to the needs, abilities and interests of students which shows the importance of flexibility in the process of curriculum implementation.

In general the article presents clear picture of the secondary school curriculum of Ethiopia from its planning to its implementation and the different problems faced during implementation by suggesting the solution so as to bring an all rounded development of students. Besides this it also indicated important points /recommendations for developers as well as practitioners of the curriculum. So it is advisable to take the comments in to consideration and revise and implement the revised curriculum as suggested by the authors.

References


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