
Learning and teaching materials

Educational materials

The central role of textbooks and other learning and teaching materials (LTM) in enhancing the quality of learning and improving student performance is widely recognized (Smart and Jagannathan, 2018; GEM Report, 2016b). In low-income countries, quality LTM can compensate for disabling factors such as large class sizes, poorly trained or unqualified teachers, a shortage of instructional time, high levels of illiteracy among parents, and a lack of reading materials in homes (Smart and Jagannathan, 2018; Read, 2015).

Quality LTM are crucial for achieving SDG 4. Ensuring that every institution has appropriate learning materials and technology is a key strategy for reaching target 4a in particular. According to the [Education 2030 Framework for Action](#), '[e]ducation institutions and programmes should be adequately and equitably resourced, with ... books, other learning materials, open educational resources and technology that are non-discriminatory, learning conducive, learner friendly, context specific, cost effective and available to all learners – children, youth and adults' (Education 2030, 2016: 33).

Definitions and practical considerations

- **Textbooks** are the most visible aspects of a curriculum and are often considered the main script that shapes the teaching and learning processes (UNESCO, 2017). Quality textbook development and provision involves four main steps: development (based on curricular frameworks); procurement systems (state or private sector, approved textbooks list); distribution and access (arrival in schools, issuance to students); and storage and conservation.
- **Teachers' guides** support teachers in their teaching practices. Effective teachers' guides should: contain explicit communication of conceptual goals with links to proposed activities, provide knowledge and support to help understand and implement teaching plans, reinforce pedagogical content knowledge, give guidance on the practice and understanding of relevant pedagogical activities, present alternatives and freedom of choice, and engage teachers in ongoing reflection.
- **Supplementary materials** include books, newspapers, informational pamphlets, and other materials printed in mother tongue and instructional languages reflecting local customs and concerns. They enrich teaching, engage students in multi-dimensional learning, build students' abilities to apply their knowledge (Elliott and Corrie, 2015), and are thus critical for literacy outcomes (Read, 2015). Studies show that investments in reading books and school libraries have an even greater correlation with increases in student achievement in lower grades than investments in textbook provision (Read and Treffgarne, 2011; Read, 2015).
- **Multimedia and digital resources** are a growing source of knowledge for teachers and learners. Several studies show that greater access to information and communication

technologies in schools can help reduce the digital divide between low- and high-income groups (UNESCO, 2014a; Jacob, 2016). The digital era has challenged conventional textbook practices. Textbooks need updating more frequently and need to support collaborative and interactive pedagogical methods (Smart and Jagannathan, 2018).

What we know

Studies suggest that textbooks and similar materials (workbooks, exercise books) can increase student learning (Glewwe et al., 2011). The two most consistent characteristics in improving student performance are the availability of LTM, and well trained, prepared, supervised and motivated teachers. Since providing textbooks is cheaper than training and motivating teachers, textbooks are the most cost effective of all education inputs on student achievement (Read, 2015).

Several studies in Africa documented the positive correlation of textbooks and learning achievement (UIS, 2012). [PASEC](#) (Programme d'analyse des systèmes éducatifs de la CONFEMEN) and [SACMEQ](#) (Southern and Eastern Africa Consortium for Monitoring Educational Quality) results show significant positive correlations between access to textbooks and student test scores in both reading and mathematics (SACMEQ, 2010; Kuecken and Valfort, 2013; PASEC, 2015).

However, many conditions need to be met for LTM to enhance learning. For textbooks to be effective, they must be regularly used in class, be in a language that is widely understood by both students and teachers (Read, 2015), and improve teacher–learner interaction (World Bank, 2018a). Kuecken and Valfort (2013) warn about possible biases due to omitted variables such as teacher qualification or school infrastructure that may influence both textbook access and educational outcomes. They make a distinction between the impact of textbook sharing and textbook ownership on learning outcomes, finding an impact for textbook sharing only amongst students of a high socio-economic status.

In order to enable quality learning for all users, all links of the LTM chain – including definition, design, creation, development, production, distribution, storage, and classroom usage – must be carefully considered (Read, 2015: 29–30).

Challenges

Many countries still face the challenges of insufficient availability, poor quality, and ineffective usage of LTM (Elliot and Corrie, 2015). Equity and inclusion are also key issues to be addressed at all stages of LTM development and provision.

Provision, cost, and accessibility

Accessibility is ‘the extent to which an individual or group is able to acquire and use these tools, either freely or at an affordable cost’ (UNESCO 2014b: 13). Adequate supply is considered a minimum of one textbook for three students, and, at primary level, enough reading books so that every child has access to at least one new book per week. Given that LTM are often first to be hit by severe funding constraints, reducing their cost is key to improving their accessibility (Read and Treffgarne, 2011). With increased enrolment rates, LTM provision systems are more expensive to maintain, and the high risk of corruption across the LTM value chain may influence price. For example, textbook contracts may be awarded in favour of books of lower quality and higher cost (GEM Report, 2016a). While highly centralized book production systems are expensive, decentralization requires the creation of specialized management, monitoring, and supervision

systems operated by trained staff and supported by regular and reliable budget allocations. It also requires the establishment of approved textbook lists, from which schools themselves may select the titles they want (Read, 2015).

Data and monitoring

Many countries do not have clearly defined, achievable LTM provision targets, nor access to data that enable them to estimate LTM supply and allocation to schools (Read, 2016). Private sector competition can lead to better production, higher quality, and reduced prices, but only if good management and monitoring processes exist within ministries of education (Read, 2015).

Quality and relevance

The physical characteristics of textbooks have a strong impact on their longevity and ultimately on their lifetime costs. The quality of layout, font, illustrations, and/or graphics, as well as the balance between visuals and text, also plays a key role in learning processes. For electronic media (e.g. audio, graphics, video, animation), quality may be judged in terms of functionality as well as design, interactivity, and ease of navigation. For web resources, ease of access and navigation is important.

LTM should be a product of the curriculum development process and therefore aligned to the philosophy, objectives, content, methodology, and evaluation of the curriculum (UNESCO, 2005; Oates, 2014; Smart and Jagannathan, 2018). They should be age-appropriate and take into account different linguistic environments, local and indigenous knowledge, skills, and materials as well as the background and needs of learners (UNESCO, 2005; UNESCO, 2014b).

LTM need to be grounded in both learning theory and subject-specific content theory, provide varied application of concepts and principles, facilitate active and equitable participation of all learners, and guide learners to reflect on what they are learning (Oates, 2014). Finally, the likelihood of LTM leading to quality learning highly depends on how teachers use them. Many teachers have little or no practical experience in the correct and creative use of textbooks and associated teachers' guides.

Equity and inclusion

Quality textbooks should be free from divisive stereotypes and prejudices, frequently revised and updated to reflect changing local, national, regional, and international contexts (UNESCO, 2017). While LTM must adapt and respond to the diverse needs of all learners 'in a wide range of cultural contexts, economic conditions and educational settings', as well as personal situations (UNESCO, 2005: 3), they also need to represent this diversity in their content. However, some textbooks still present stereotypical, simplistic interpretations of gender and of ethnic, cultural, religious, and linguistic minorities (GEM Report, 2016b). The underrepresentation of people with disabilities in textbooks across the world perpetuates their invisibility and disadvantage.

Resources should be available in a language comprehensible to learners, in particular for 'low-achieving' students (Read, 2015). Textbooks should accommodate the special needs of learners with disabilities, through large font and Braille editions, augmentative and alternative modes, and adapted versions at simpler levels of reading difficulty. In crises and emergencies, textbooks need to respond to these particular contextual challenges as part of integrated, crisis-sensitive education content and planning approaches (Batton et al., 2015).

Policy and planning

Design and implement a textbook policy

A textbook policy can help align the ‘quality’ components of education – curriculum, textbooks, and assessment systems – with the learning process in the classroom. A textbook policy can also facilitate allocation of budgets between physical and digital materials and ensure coherence between curriculum, classroom practices, and learning objectives. The policy should set out the roles of the different actors involved in the process (Smart and Jagannathan, 2018).

Provide capacity building

Capacity building may involve the training of textbook producers to create inclusive materials; support efforts of national and local publishing industries as providers of affordable textbooks and reading materials; training in content authoring and evaluation; and teacher training to develop and use textbooks and supplementary learning materials (UNESCO 2014b; UNESCO 2014c).

Develop computerized LTM management information systems

Investment in a national, computerized LTM management system can provide information, system control, and accurate forward-cost projections. Examples include Rwanda Learning and Teaching Materials Management Information System (LTMMIS) and Namibia Learning Support Materials Management Information System (LSMMIS) (Read, 2016: 14–19).

Decentralizing supply and distribution

Decentralizing from supply-side policies to demand-based school selection allows schools to select and order LTM efficiently, and ensure ownership of the materials selected (Read and Treffgarne, 2011).

Investing in school and classroom storage and simple school management and usage systems, as well as opting for materials with high production specifications and a long book life, can help achieve maximum cost amortization and minimum distribution costs (Read, 2015). A shift from state- to private-sector authorship, publishing, production, and distribution in a public private partnership with government offers potential for better production and presentational quality as well as reduced prices (Read, 2015; Smart and Jagannathan, 2018). Innovative financing models based on PPPs include [Gavi \(the Vaccine Alliance\)](#) whose approach could increase access to textbooks in low-income countries (Elliott and Corrie, 2015) and [The Global Book Alliance](#) (Results for Development and International Education Partners Ltd., 2016).

Programmes and reforms

- Rwanda: an innovative textbook distribution programme significantly increased access to textbooks (GPE Secretariat, 2013).
- Cameroon: a textbook reform which introduced a single book per subject and price approval, led to a reduction in corruption and costs (Ntap, 2017).
- Kenya: Secondary Education Quality Improvement Project reforms reduced the cost of textbooks for grades 7 to 12 by almost 65 per cent (Jena, 2018).
- Swaziland : free textbooks have been provided to all primary school pupils since 2003,

leading to a 25 percentage point increase in the number of pupils with textbooks (SACMEQ, 2011)

- Guatemala and Nicaragua: free textbook programmes target the most disadvantaged learners (GEM Report, 2016a)

Plans and policies

- Ghana: [Textbook Development and Distribution Policy for Pre-Tertiary Education](#) (2002)*
- Pakistan: [National Textbook and Learning Materials Policy and Plan of Action](#) (2007)
- Namibia: [Republic of Namibia Textbook Policy](#) (2008)
- Mali: [Politique nationale du manuel scolaire et du matériel didactique](#) (2010)
- Democratic Republic of the Congo: [Politique nationale des manuels scolaires](#) (2017)

*See *Opoku-Amankwa, Brew-Hammond, and Mahama, 2015.*

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