basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF BASIC EDUCATION INPUTS AND CONTRIBUTION TO A NATIONAL DIGITAL E-BOOK/E-CONTENT STRATEGY

1. INTRODUCTION

The accelerated implementation of ICTs in e-Education in some provinces and the proliferation of technologies in learner-hands are placing new demands on the quality, relevance, availability and accessibility of digital content.

Unfortunately, the basic education sector currently has under-developed digital teaching and learning resources. This gap is exacerbated by the following challenges:

- Digital content is scattered among provincial and private portals as well as developers, which requires teachers and learners to search for content from multiple sources.
- The majority of schools have limited or no access to online digital content resources due to limited or lack of access to quality broadband internet services.
- The wealth of digital content in cyberspace is not quality assured or customised to meet the needs of teachers and learners in South African classrooms.
- There is a shortage of localized device-agnostic digital content for the school curriculum due to limited local content development initiatives.
- Provinces and schools are procuring and using proprietary digital content/software without quality assurance and controlled procurement processes.
- There are no guidelines for content developers regarding the content requirements of the basic education sector in respect to quality, standards, subjects and content needs.

Therefore, there is a need for centralised digital content control and development to ensure that high quality and relevant digital content resources are available free of charge via offline and online delivery methods using any digital device. This process requires a National Digital Content Strategy to provide a framework for addressing the challenges of

content availability, accessibility, quality assurance, demand, standards and relevance to the needs of the basic education sector.

2. BACKGROUND

The draft basic education sector-wide plan, Action Plan to 2019: Towards the Realization of Schooling 2030 set 27 national goals for improving the quality of education in South Africa. Goal 19 of the Action Plan advocates for "ensuring that every learner has access to the minimum set of textbooks and workbooks required in accordance with national policy". Given linguistic, cultural and social diversity of South Africa, the Action Plan recognises the significance of quality and locally customized content in multiple indigenous languages.

Learner access to textbooks and workbooks has drastically improved over the years, however, the Department of Basic Education (DBE) believes that print books need to be complemented by digital content resources that offer additional benefits not provided by the conventional print media. Digital content resources can be easily and randomly accessed, adapted and manipulated. Furthermore, digital content can be accessed from many locations using a variety of devices.

The White Paper on e-Education (2004) advocates for open national standards that clarify compliance requirements, responsibilities and implementation mechanisms for the educational soundness of digital content as outline below:

- content relevance and reliability to ensure that the purpose of the content is readily apparent;
- adds value to teaching and learning tasks, includes processes and criteria for learner assessment, and is compliant with the curriculum;
- accessibility to ensure that content is compatible and inter-operable with existing application software and hardware; it complies, where feasible, with accessibility standards for learners with disabilities and barriers to learning; and
- usability to ensure that content is easy to use and recognise.

Inter-operability of digital content standards includes:

- accessibility to ensure that content is accessible from many locations;
- inter-operability to ensure that learning components developed with one platform or set of tools can be used in another location with a different platform or set of tools;
- durability to ensure that technology changes can be made without redesign or

recoding;

- scalability to ensure that a system (both hardware and software) has the ability to be distributed to large numbers of learners in diverse locations; and
- flexibility to ensure that learning components from a range of sources can be used and remixed.

Rights management standards include:

- equitable rights licensing that allows for negotiation of intellectual property licensing to benefit the education sector and investment shareholders, as well as stimulate the content resource development market;
- branding based on a common structure, format and expression of rights information;
- a flexible right trading that enables rights to be traded in accordance with the digital, modular and dynamic nature of learning content.
- legal rights compliance that ensures that licensing rights are honoured and trading rights are supported.

3. DIGITAL CONTENT RESOURCES

Digital resources have the potential to improve the quality of education by providing access to innovative, adaptable, relevant, captivating and engaging content that appeals to the 21st century learner who is technology-orientated. These resources can also offer teachers new ways of engaging learners and infusing education using learner-centred 21st century classroom practices.

The White Paper on e-Education (2004) requires that the curriculum be "supported through effective, engaging and sustained software, electronic content and online learning resources, and teachers, content developers and administrators who contribute effectively to these resources".

There is evidence of slow but gradual migration of schools and provincial education departments from print to digital textbooks due to a host of advantages such as:

- cost savings;
- ease of mobility (portability) and accessibility via laptop, tablet or smart phone;
- incorporable into digital learning platforms/systems;
- ease of updating;
- devoid of textbook retrieval processes; and
- relates to how learners engage with information in their daily lives.

The DBE is also of the view that access to free quality content by schools should be complemented by a streamlined and quality-assured process of accessing proprietary content resources. This will be achieved by creating a special category of Learning and Teaching Support Materials (LTSM) for e-learning resources (e-LTSMs) in the national LTSM approval processes.

4. DIGITAL CONTENT RESOURCE DEVELOPMENT

The basic education sector aims to deliver content that is balanced between teacher-created content, open education resources and publisher-provided content resources. This will provide the best customized content combination for teachers and learners since access to digital devices is still marginal.

The Department of Basic Education is investing in developing engaging digital content that is aligned with Curriculum Assessment Policy Statements (CAPS), accessible offline and online, and can function independently of operating systems. The focus is on developing interactive rather than static digital content resources that support critical areas of the National Strategy for Learner Attainment (NSLA) including, but not limited to:

- Provision of Early Childhood Development (ECD) opportunities in schools;
- Numeracy and literacy at General Education and Training (GET) with the aim of improving learner performance in the Annual National Assessment (ANA);
- Mathematics, Science, and Technology Strategy and the Dinaledi Schools programme;
- Enhancing the interactivity of the DBE Rainbow Workbooks through audio-visual and instant assessment feedback;
- Methods, tools, and support systems that facilitate learning for learners who experience barriers to learning;
- Digital educational material to support the Incremental Introduction of African Languages (IIAL);
- Methods, tools, and support systems that reduce the isolation and address the unique requirements of learners in rural and farm schools; and
- Development of educational materials for IT and CAT that use illustrative examples from Open Source products rather than their equivalent proprietary equivalents.

5. DEPARTMENT OF BASIC EDUCATION CONTENT INITIATIVES

Current content initiatives entail the development of interactive and static digital curriculum content.

5.1 Interactive Rainbow Workbooks

The DBE is in the process of converting the DBE Rainbow workbooks for numeracy/mathematics and literacy/language into a digital interactive format. This conversion aims to enhance the interactivity of the workbooks through audio-visual and instant assessment feedback.

5.2 Digital 'hybrid' Textbooks/Workbooks

The DBE in partnership with Sasol Inzalo Foundation (SalF) have developed Grade 4 – 9 digital CAPS aligned 'hybrid' textbooks/workbooks for Natural Science, Technology and Mathematics, which are accessible offline and online. These 'hybrid' text/workbooks provide a concise comprehensive coverage of the grade subject content with complementary activities.

5.3 Curriculum Enrichment Videos

The DBE, in collaboration with partners are providing schools with access to curriculum aligned and enrichment videos developed by the Khan Academy, Mindset Network, SABC and Discovery Channel.

5.4 Open Education Resources (OERs)

The DBE plans to establish partnerships to develop freely accessible educational resources to be made available online through the educational portals, Thutong and Edu-cloud, in order to achieve economies of scale in producing and sharing Open Educational Resources (OERs).

5.5 Open Source Textbooks

The DBE plans to invest in the development of open source textbooks that will be licensed under an open source copyright license and made available free of charge to users. The development of open source textbooks is part of the broader OER movement and is seen as a solution to the challenges of cost and distribution of traditionally published proprietary textbooks.

5.6 Digital Libraries

The DBE supports the creation of digital libraries in which collections of digital resources including text, visual, audio and video material will be stored and accessed in electronic media formats. The electronic content will be mainly stored in the DBE Cloud (Educational Network) that will serve as the main digital repository for the basic education sector.

The DBE also plans to create offline mini-digital libraries at schools, districts, teacher centres and provincial offices. The capacity and context of the mini-digital libraries will be dependent on the existing ICT infrastructure and local requirements of the host site. All initiatives to establish schools print-based libraries will include digital libraries.

6. DIGITAL CONTENT RESOURCE DISTRIBUTION & ACCESS

6.1. Online Content Distribution

The DBE, in collaboration with the provincial education departments developed a national education portal, Thutong. The portal provides a platform for accessing content, information-sharing, hosting communications and collaboration applications for learners, teachers, administrators, managers and parents through blogs and forums. It also provides a platform for contributing content resources by teachers, curriculum specialists and broader education community. However, success in achieving most of the intended portal functions has been limited via the Thutong portal, hence the need for a new robust DBE Cloud solution.

Provincial curriculum portals are also used as platforms for distribution of online digital content particular that which is based on provincial context.

6.2. Offline Content Distribution

The penetration of Internet connectivity in schools is still marginal, therefore the distribution of offline digital content is prioritized by the DBE. Relevant digital curriculum content is distributed to schools on DVDs/CDs and other storage devices or preloaded on new ICT equipment before it is installed at schools.

7. DIGITAL CONTENT RESOURCE HOSTING

The rising demand for quality digital content for schools requires a robust and dedicated educational network of remote servers to store, manage and process content.

The DBE, in partnership with Department of Telecommunications and Postal Services (DTPS) are currently in the process of developing a new dedicated and robust DBE Cloud solution. Telkom is the service provider for the Cloud solution that will provide the following services:

- Storage, management and processing of content;
- Access to content by learners, teachers and other stakeholders via different devices;
- Ability to track and monitor content usage and data analysis;
- Integration of resources into virtual learning platforms (VLEs);
- Ability to provide offline content or content on demand;
- Provide users with storage space;
- Ability to host software applications for download; and
- A Learning Management System (LMS).

The development of a dedicated DBE Cloud will:

- provide a flexible, scalable and cost effective model that will keep abreast of the rapidly changing infrastructure and software requirements of schools;
- allow for software standardization across schools;
- provide a shared pool of applications for use by schools and easier maintenance of the apps through centralized licensing and updates;
- supports multiple client platforms both inside and outside the school infrastructure; and
- allow for blended learning through a Learning Management System (LMS) that enables:
    - learner management, tracking and reporting;
    - assembling, customising and delivering learning content; and
    - delivering of e-learning across the basic education sector.

8. DIGITAL CONTENT RESOURCE PACKAGING AND TAGGING WITHIN A ROBUST PORTAL ARCHITECTURE

The development of content packages for specific target groups and subjects is critical for the effective delivery of content and assessment for e-learning. This is particularly useful through Learning Management Systems (LMS) that enable the delivery of digital content across platforms and allows users to access and manipulate the content.

In order to stimulate the utilization of digital content, users must be given easy access to

specific information according to their needs. Therefore, it is imperative that content is tagged by specialists with insight into the curriculum.

Tracking content usage will help DBE to understand when, where and how long content is viewed. This will assist content managers to understand user patterns and requirements in order to take the necessary action to address these requirements.

9. PROPRIETARY DIGITAL CONTENT RESOURCE

The Departments of Education (national and provincial) seek to play a regulatory role by reviewing available proprietary digital Learner and Teacher Support Materials (LTSM) and approving them where they meet required standards or criteria. In the short term, the DBE plans to model an appropriate process for screening proprietary digital LTSM (e-LTSM) by creating a special category of LTSM for e-learning electronic content resources and integrating it into the existing LTSM screening and approval processes. In the long term, approval of digital LTSM will be undertaken by each province. It is therefore imperative that teachers gradually develop confidence and competence in the selection and use of digital content for teaching and learning.

10. TEACHER DEVELOPMENT FOR DIGITAL CONTENT

Teachers require a range of professional development opportunities if they are to be effective users of digital resources in a technology-rich learning environment.

These opportunities should take cognisance of the following:

- The design of professional development needs to conform to standards of st practice that are supported by the DBE.
- Professional development that meets the needs of teachers at various stages of knowledge, skills, understanding and practice should be developed.
- Professional development should include an understanding of theories relevant to the new forms of learning, collaboration, innovation and communication made possible by the availability of accessible, high-quality digital content and technology-rich learning environments.
- Professional development and advice concerning the use of online learning environments needs to move beyond imparting knowledge of the platform and the tools to include resource selection and evaluation, learning activity design and assessment.

- Professional development should allow teachers to gain confidence and expertise in the use of state-of-the-art tools that can be used for interaction and collaboration.
- National and provincial online discussion groups and forums (Professional Learning Communities - PLCs) that allow teachers to share ideas and best practices can play a role in supporting professional development.
- Professional development can target teacher interest in the CAPS curriculum and explore how digital resources can be used to support aspects of the curriculum at all levels of schooling.

11. SKILLS FOR DIGITAL CONTENT DEVELOPMENT

Digital content development is new to South Africa with only a few entities embracing the new methodologies and techniques. As such there are limited skills pools in the country which inadvertently increases the demand for skilled individuals and indirectly influences costs. The DBE supports the formation of partnerships with SETAs and private entities for the development of appropriate skills for the digital content industry.

12. PUBLIC-PRIVATE SECTOR PARTNERSHIPS

The role of the private sector and NGOs is critical in ensuring the availability of quality content for the education sector. This entails the contribution and development of proprietary and non-proprietary digital content. The DBE is very eager to form partnerships that focus on the development and distribution of quality curriculum aligned OERs in priority subjects such as Accounting, Mathematics and Science. It is however imperative that developers of OERs for schools ensure that the content:

- Complies with the open national standards outlined in this document;
- Can be hosted on DBE platforms under specific conditions; and
- Can be accessed and utilized without cost implications to users.

13. ADVOCACY

It is imperative that an advocacy strategy be developed to ensure appropriate and optimum usage of digital content. The following strategies are used to mediate and promote the appropriate usage of digital content in the short term:

13.1. Presentations at various forums of education officials and teachers, including conferences.

13.2. Tutorial videos will be developed and distributed to schools.

13.3. Brochures will be developed and distributed together with the content.

13.4. Utilizing national and provincial curriculum portals.

13.5. Utilizing social networking platforms.

14. REQUIREMENTS

It is imperative that an enabling environment is in place to stimulate and facilitate the utilization of digital content in schools. This requires the DBE and PDEs to take cognizance of the following:

14.1. Teachers must be provided with clear guidelines and advice about the capabilities and skills required to access, use and create digital content for teaching and learning.

14.2. Teachers must be provided with detailed advice about pedagogies that support the use of digital content for teaching and learning.

14.3. Relevant digital curriculum resources must be provided.

14.4. Ensure the appropriateness of the technological tools to deliver the digital content resources.

14.5. Ensure that technological resources are sufficient and accessible to address equity and redress.

14.6. Ensure that teachers have the capability to use the digital content resources.

14.7. Learners must be motivated and interested in using digital content resources.

14.8. Culture of schools to institutionalise the use and management of the digital content resources and training support for managers, technicians, teachers and district officials and communities.

14.9. Political will and capacity of government and educational authorities to develop and promote strong monitoring tools for impact assessment and ongoing measurement of effective delivery.

14.10. Importance of education sector developing awareness and shared understanding about the value of digital content.

14.11. The means by which the actions of governments, education authorities, schools, teachers and learners are aligned and integrated through the implementation process to increase teacher use of such resources for the benefit of learners.

14.12. Ensure that culturally relevant content is produced for teachers and learners and that the manner in which digital resources are organized and presented has the highest impact on their usability in classrooms.