

FEDERAL UNIVERSITY OF TECHNOLOGY MINNA

NIGER STATE, NIGERIA

B.TECH. EDUCATIONAL TECHNOLOGY PROGRAMME

COURSE TITLE

GLOBALIZATION OF INSTRUCTIONAL RESOURCES

COURSE CODE

EDT 301

COURSE UNITS: 2

LECTURE NOTES

Department of Educational Technology

School of Science and Technology Education

Federal University of Technology, Minna

Niger State, Nigeria

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Study Guide

Introduction

Welcome to EDT 301 Globalization of Instructional Resources. This is a 2-credit unit course designed for students in the B.Tech. Educational Technology programme at the Federal University of Technology, Minna (FUTMINNA). It is divided into 10 Modules, each containing 3 Study Units, for a total of 30 Study Units.

This course examines the principles and practices of identifying, mobilizing, producing, utilizing, and evaluating instructional resources with particular emphasis on community resources and locally available materials. It is grounded in the recognition that effective education requires more than commercially produced textbooks: it demands creativity, cultural sensitivity, community engagement, and practical skill in designing and using instructional resources that are relevant to learners' real-world experiences.

Course Aims

The primary aim of this course is to equip student teachers and educational technologists with the knowledge, skills, and practical competencies required to:

1. Understand the relationship between globalization and educational resource development.
2. Identify, map, and mobilize human and non-human resources in school and community settings.
3. Design and produce effective instructional materials using locally available resources.

4. Apply recognized instructional design models (particularly the ASSURE model) in developing instructional packages.
5. Utilize and evaluate low-cost instructional packages in practical educational settings.

Course Objectives

On completing this course, you should be able to:

1. Define globalization and explain its implications for educational resource development.
2. Classify and identify community resources human and non-human in school and community settings.
3. Conduct a community resource survey and produce a community resource inventory.
4. Recruit, mobilize, and utilize human and non-human community resources for instructional purposes.
5. Apply the ASSURE and other instructional design models in planning resource-based instruction.
6. Design and produce improvised instructional materials using locally available resources.
7. Develop low-cost instructional packages for specific curriculum topics.
8. Utilize instructional packages effectively in classroom and community settings.
9. Evaluate the effectiveness of instructional materials and packages.
10. Demonstrate awareness of copyright, Creative Commons, and ethical principles in educational resource development.

Structure of the Course

This course is organized into 10 Modules, each with 3 Study Units. The modules are:

1. Module 1: Introduction to Globalization and Instructional Resources
2. Module 2: Community Resources in Education
3. Module 3: Human Resources in Educational Settings
4. Module 4: Non-Human Resources in Educational Settings
5. Module 5: Design Principles for Instructional Materials
6. Module 6: The ASSURE Model and Other Instructional Design Models
7. Module 7: Production of Improvised Instructional Materials
8. Module 8: Locally Available Resources as Instructional Materials
9. Module 9: Mini-Project Techniques in Educational Technology
10. Module 10: Utilization, Evaluation, and Sustainability of Instructional Packages

Assessment

Assessment in this course consists of two components. Continuous Assessment (40%) includes Tutor-Marked Assignments (TMAs) at the end of each module, participation in practical activities, and a mini-project submitted at the end of the course. The Final Examination (60%) is a written and practical examination held at the end of the semester. Students must submit all TMAs and complete the mini-project to be eligible for the final examination.

Using Open Educational Resources (OER)

This course is developed in the spirit of open education. The lecture notes are original works produced for this course and are licensed under Creative Commons Attribution 4.0 International (CC BY 4.0). Students and lecturers are encouraged to use, adapt, and share these materials freely, provided proper attribution is given to FUTMINNA CODEL and the original authors. References included in each unit draw from publicly available, open-access, and library-accessible sources.

Students are also encouraged to access the following OER platforms for supplementary study materials:

- African Virtual University (AVU): <https://www.avu.org>
- OER Africa: <https://www.oerafrica.org>
- UNESCO OER Platform: <https://www.oer.unesco.org>
- National Open University of Nigeria (NOUN) materials: <https://www.nou.edu.ng>

Module 1

Introduction to Globalization and Instructional Resources

Unit 1:	Globalization, Education, and Instructional Resources: A Conceptual Overview
Unit 2:	Types and Classification of Instructional Resources
Unit 3:	Principles of Resource Utilization in Education

Unit 1

Globalization, Education, and Instructional Resources: A Conceptual Overview

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1.0 Introduction

Welcome to EDT 301: *Globalization of Instructional Resources*. Let us begin by exploring a concept you likely encounter often—*globalization*. You may have heard it discussed in news

reports, academic conversations, or development debates. But at this point, it is important to ask: *what does globalization mean within the context of education and instructional technology?*

Globalization refers to the increasing interconnectedness of societies, economies, cultures, and knowledge systems across national boundaries. In education, this interconnectedness has transformed how knowledge is created, shared, and applied. As an educator or instructional technologist, you are no longer operating within a purely local system; rather, you are part of a broader global knowledge network.

On one hand, globalization introduces access to diverse instructional tools, digital technologies, and innovative teaching practices. On the other hand, it raises critical concerns about cultural relevance, identity, and equity. For instance, should all educational content be globally standardized, or should it reflect local realities?

In this unit, you will explore the concept of globalization, its relationship with education, and the role of instructional resources as a bridge between global knowledge and local application. This foundation will help you critically evaluate and effectively use instructional materials in your educational practice.

2.0 Learning Outcomes

At the end of studying this unit, you should be able to:

1. Define globalization and explain its key dimensions.
2. Describe the relationship between globalization and educational practice.
3. Explain the concept of instructional resources and their role in teaching and learning.

3.0 Learning Contents

3.1 Defining Globalization

Let us consider globalization as a multidimensional process. It is not limited to economics alone; rather, it encompasses economic, cultural, technological, political, and educational transformations occurring on a global scale.

From an economic perspective, globalization involves the integration of markets and financial systems. From a cultural standpoint, it refers to the spread of languages, values, and media across borders—often described as cultural diffusion. Technologically, globalization is driven by digital communication systems that enable near-instant interaction across the world.

At this point, it is important to note that globalization significantly influences education. It determines what knowledge is valued, how teaching is structured, and which competencies learners are expected to develop. For example, the growing emphasis on digital literacy, critical thinking, and intercultural competence reflects global educational priorities.

We can understand globalization through its key dimensions. These include economic globalization (integration of markets), technological globalization (spread of digital tools), cultural globalization (diffusion of cultural values), educational globalization (sharing of curricula and resources), and political globalization (influence of international governance structures).

Key Dimensions of Globalization:

- Economic Globalization: Integration of markets, trade, and financial systems worldwide.

- Technological Globalization: Spread of digital tools, internet access, and communication platforms.
- Cultural Globalization: Diffusion of cultural values, media, languages, and artistic expressions.
- Educational Globalization: Cross-border sharing of curricula, pedagogical approaches, and learning resources.
- Political Globalization: Growth of international organizations and cooperative governance frameworks.

Self-Assessment Exercise(s)

1. Define globalization in your own words.

2. Mention three dimensions of globalization and give one example of each.

3. How do you think globalization has affected education in Nigeria? Give two examples.

3.2 Globalization and Educational Practice

Now that you understand globalization, let us examine its impact on educational practice.

Globalization has reshaped education by introducing global perspectives into curricula and redefining the role of teachers. Educators are now expected to prepare learners not only for local participation but also for global engagement.

Organizations such as UNESCO have played a significant role in promoting global educational frameworks. These frameworks emphasize inclusion, quality, and measurable learning outcomes across countries.

However, it is important to approach globalization critically. The direct adoption of foreign instructional materials can create mismatches between content and learners' lived experiences. For example, a textbook developed in Europe may include cultural references unfamiliar to students in Nigeria. This highlights the need for contextualization.

At this point, the concept of *glocalization* becomes essential. Glocalization refers to blending global knowledge with local relevance. In education, it involves adapting international resources to suit local cultures, languages, and realities. This ensures that learning remains meaningful and relatable.

For educators, globalization presents both responsibilities and opportunities. You are expected to critically evaluate global trends, adapt resources appropriately, and equip learners with both local and global competencies.

Implications of Globalization for Educators:

- Need to develop critical awareness of global educational trends.
- Responsibility to adapt global resources to local cultural and linguistic contexts.
- Opportunity to share locally developed knowledge and resources with a wider audience.
- Requirement to equip learners with both local and global competencies.

Self-Assessment Exercise(s)

- | |
|---|
| 1. Explain the concept of glocalization with an educational example |
| 2. Identify two risks associated with using global instructional materials without adaptation |
| 3. Discuss the role of international organizations in shaping education |

3.3 Instructional Resources: Concept and Role

Having explored globalization and education, let us now focus on instructional resources—the core of this course.

An instructional resource refers to any material, tool, person, or environment that facilitates teaching and learning. In simple terms, these are the means through which educational objectives are achieved.

Instructional resources can be categorized into human and non-human resources. Human resources include teachers, learners, and community members who contribute knowledge and experience. Non-human resources include textbooks, videos, digital devices, real objects, and environmental settings.

It is important to recognize that learners differ in abilities, backgrounds, and learning styles. Therefore, the effective use of instructional resources enhances understanding by making learning more concrete, engaging, and memorable.

The work of Edgar Dale provides valuable insight here. His Cone of Experience suggests that learners retain more information when they engage in direct, hands-on experiences compared to passive forms of learning such as reading or listening alone. This reinforces the importance of using varied instructional resources.

Instructional resources serve several important functions. They help make abstract ideas tangible, stimulate learner interest, improve retention, support individual learning differences, and enhance communication.

In a globalized world, instructional resources also act as bridges. They connect global knowledge with local realities, promote critical thinking about global issues, and enable the sharing of indigenous knowledge on a wider scale.

Functions of Instructional Resources:

- Concretization: Making abstract concepts tangible and understandable.
- Motivation: Stimulating learner interest and curiosity.
- Retention: Helping learners remember information more effectively.
- Individualization: Catering to diverse learning styles and abilities.
- Communication: Facilitating clear and effective transmission of knowledge.

In the context of globalization, instructional resources take on additional significance. They can serve as bridges between global knowledge and local realities, as tools for promoting critical thinking about global issues, and as vehicles for preserving and sharing local cultural knowledge with the wider world.

Self-Assessment Exercise(s)

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|--|
| 1. Define instructional resources and provide three examples |
| 2. Differentiate between human and non-human instructional resources with examples |
| 3. Explain why hands-on learning is more effective using Dale's Cone of Experience |
| 4. Describe four functions of instructional resources |

4.0 Conclusion

In this unit, you have explored the foundational concepts of globalization, its influence on education, and the role of instructional resources. You have seen that globalization offers both opportunities and challenges, requiring educators to think critically about the materials they use. The concept of glocalization emphasizes the importance of adapting global resources to local contexts. Instructional resources, in turn, serve as essential tools for making this connection effective and meaningful.

5.0 Summary

In this unit, you have learnt that globalization is a multidimensional process involving economic, cultural, technological, educational, and political dimensions. You have also seen that globalization significantly influences educational practice by shaping curricula, teaching methods, and learning expectations.

Furthermore, you have understood that while globalization provides access to diverse resources, it also requires careful adaptation to ensure cultural relevance. The concept of glocalization helps bridge this gap.

Finally, you have learned that instructional resources—whether human or non-human—play a critical role in enhancing teaching and learning by improving understanding, motivation, retention, and communication.

6.0 Tutor-Marked Assignment (TMA)

1. Define globalization and explain its five key dimensions
2. Discuss the concept of glocalization with relevant examples from Nigeria
3. Explain instructional resources and classify them with examples
4. Analyse the implications of globalization for instructional material development
5. Using Edgar Dale’s Cone of Experience, justify the use of diverse instructional resources
6. Explain how instructional resources can bridge global knowledge and local realities

7.0 References/Further Reading

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Unit 2

Types and Classification of Instructional Resources

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1.0 Introduction

2.0 Learning Outcomes

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3.1 Classification of Instructional Resources by Sensory Mode

3.2 Projected and Non-Projected Instructional Materials

3.3 Criteria for Selecting Instructional Resources

4.0 Conclusion

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6.0 Tutor-Marked Assignment (TMA)

7.0 References/Further Reading

1.0 Introduction

Building on what you learned in Unit 1, let us now deepen your understanding of instructional resources by examining their types and classifications. As you may recall, instructional resources include all materials, tools, people, and environments that support teaching and learning.

At this point, it is important to recognize that not all instructional resources serve the same purpose. Different learning situations require different types of resources. Therefore, understanding how these resources are classified will help you make informed and effective instructional decisions.

In this unit, you will explore how instructional resources are categorized based on sensory engagement, how they are grouped into projected and non-projected materials, and the criteria that guide their selection. This knowledge will prepare you to design and utilize instructional materials that are both contextually relevant and pedagogically sound.

2.0 Learning Outcomes

At the end of studying this unit, you should be able to:

1. Identify and describe the major categories of instructional resources.
2. Distinguish between projected and non-projected instructional materials.
3. Explain the criteria for selecting appropriate instructional resources for specific learning situations.

3.0 Main Content

3.1 Classification of Instructional Resources by Sensory Mode

Let us consider one of the most practical ways of classifying instructional resources—by the sensory channels through which learners receive information. Human learning is inherently multi-sensory, involving sight, hearing, touch, and movement. Instructional resources differ in how they engage these senses.

Visual resources are those perceived through sight. These include charts, diagrams, maps, photographs, posters, and textbooks. In many classrooms, particularly in Nigeria, visual resources are widely used because they effectively present relationships, patterns, and structures.

Audio resources, on the other hand, engage the sense of hearing. Examples include radio broadcasts, audio recordings, podcasts, and verbal instruction. These are especially useful in language learning and for learners with visual impairments.

Audiovisual resources combine both sight and sound. Examples include videos, television programs, and multimedia presentations. It is important to note that combining visual and auditory inputs often enhances comprehension and retention.

Tactile and kinesthetic resources involve touch and physical activity. These include models, specimens, laboratory equipment, and hands-on tasks. Such resources are essential in science and technical education, where learning by doing is critical.

Finally, multi-sensory resources engage multiple senses simultaneously. Activities such as demonstrations, field trips, simulations, and role-playing fall into this category. These tend to produce deeper and more lasting learning experiences.

The ideas of Edgar Dale support this classification, emphasizing that learners retain more when actively engaged through multiple sensory experiences.

Self-Assessment Exercise(s)

1. Describe four categories of instructional resources based on sensory mode
2. Provide two examples each of visual, audio, and tactile resources

3. Explain why multi-sensory learning experiences are often more effective

3.2 Projected and Non-Projected Instructional Materials

Another important way to classify instructional resources is by whether they require projection equipment.

Projected instructional materials are those that require a device such as a projector or screen to be viewed by learners. Examples include slides, digital presentations, films, and videos. These materials are particularly useful when teaching large groups, as they allow information to be displayed clearly to many learners at once.

Non-projected instructional materials, in contrast, do not require any special equipment. These include textbooks, charts, posters, real objects, and printed handouts. They are often more accessible and practical, especially in environments with limited technological infrastructure.

At this point, it is important to reflect on the realities of many educational settings in Nigeria, where electricity and digital infrastructure may be unreliable. In such contexts, non-projected materials remain highly valuable.

However, globalization has increased access to digital and projected materials such as e-learning platforms and online videos. Therefore, an effective educator must be able to balance both types, selecting what works best for the specific teaching context.

Self-Assessment Exercise(s)

1. Define projected and non-projected instructional materials with examples
2. Which type of material would be most suitable in a school with limited electricity? Explain your choice
3. Discuss one advantage and one limitation of projected instructional materials

3.3 Criteria for Selecting Instructional Resources

Having explored the types of instructional resources, let us now focus on how to select the most appropriate ones.

The selection of instructional resources should not be random. Instead, it should be guided by clear criteria to ensure effectiveness and relevance.

First, alignment with learning objectives is essential. A resource must directly support what learners are expected to achieve. Without this alignment, even the most attractive resource may fail to produce meaningful learning.

Second, learner characteristics must be considered. Factors such as age, prior knowledge, cultural background, and learning needs influence how learners interact with instructional materials. For instance, a resource designed for learners in another cultural context may need adaptation before use.

Third, practical feasibility is crucial. You must consider whether the resource is available, affordable, and usable within your environment. For example, a digital simulation may be ideal in theory but impractical in a school without reliable electricity.

Fourth, the quality and accuracy of the resource must be ensured. Instructional materials should be factually correct, unbiased, and clearly presented.

Fifth, engagement and motivational value play a significant role. Resources that capture learners' attention and encourage active participation tend to enhance learning outcomes.

Finally, ethical and copyright considerations must not be overlooked. Resources should either be properly licensed or fall under open licenses such as those provided by the Creative Commons.

This ensures legal and ethical use of materials.

Self-Assessment Exercise(s)

1. Explain five criteria for selecting instructional resources
2. Suggest two appropriate resources for teaching photosynthesis in a rural school and justify your choices.
3. Discuss why ethical considerations are important in instructional resource selection

4.0 Conclusion

In this unit, you have examined how instructional resources are classified and selected. You have learned that resources can be grouped based on sensory engagement and their method of presentation. You have also explored the importance of selecting resources carefully, considering factors such as objectives, learners, context, and ethics. These insights will guide your effective use of instructional resources in real-world teaching environments.

5.0 Summary

In this unit, you have learnt that instructional resources can be classified based on sensory modes such as visual, audio, audiovisual, tactile, and multi-sensory. You also learned that instructional materials can be categorized as projected or non-projected, each with its advantages depending on context.

Furthermore, you now understand that selecting instructional resources requires careful consideration of learning objectives, learner characteristics, feasibility, quality, engagement, and ethical standards. In resource-limited settings, locally available and non-projected materials often provide practical and effective solutions.

6.0 Tutor-Marked Assignment (TMA)

1. Describe the classification of instructional resources by sensory mode with examples
2. Differentiate between projected and non-projected instructional materials
3. Explain five criteria for selecting instructional resources
4. Critically evaluate the statement: “Digital resources are always superior to non-digital resources” using examples from Nigeria
5. Explain how learner diversity influences instructional resource selection

7.0 References/Further Reading

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Unit 3

Principles of Resource Utilization in Education

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3.1 Principles of Effective Resource Utilization

3.2 Barriers to Effective Resource Utilization in Educational Settings

3.3 Strategies for Overcoming Barriers to Resource Utilization

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5.0 Summary

6.0 Tutor-Marked Assignment (TMA)

7.0 References/Further Reading

1.0 Introduction

In the previous units, you explored the concept of globalization and examined the types and classification of instructional resources. At this point, you have developed a solid understanding of *what instructional resources are*. Let us now move a step further to examine *how these resources should be used effectively*.

It is important to note that the mere availability of instructional resources does not automatically result in effective teaching and learning. A classroom may be well-equipped with materials, yet learning outcomes may remain poor if those resources are not properly utilized. This highlights the importance of understanding the principles that guide effective resource utilization.

In this unit, you will learn the key principles that underpin effective use of instructional resources, examine common barriers—particularly within the Nigerian educational context—and explore practical strategies for overcoming these challenges. This knowledge will empower you to become a more reflective and resourceful educator.

2.0 Learning Outcomes

At the end of studying this unit, you should be able to:

- i. Explain the key principles of effective instructional resource utilization
- ii. Identify common barriers to effective resource utilization in educational settings
- iii. Propose practical strategies for overcoming barriers to resource utilization

3.0 Main Content

3.1 Principles of Effective Resource Utilization

Let us consider the guiding principles that ensure instructional resources are used meaningfully rather than superficially. These principles are grounded in educational technology, pedagogy, and cognitive psychology.

Principle 1: Principle of Appropriateness:

Resources must be appropriate for the learner's age, educational level, cultural background, and language. A resource that overwhelms a learner with too much information, or one that uses language and images outside the learner's experience, will fail to promote learning. Appropriateness also means that resources should be physically suitable for use in the available space and infrastructure.

Principle 2: Principle of Relevance:

Resources must be directly related to the learning objectives of a lesson. Using a resource simply because it is interesting or available, without connecting it to the lesson's goals, wastes instructional time and may confuse learners. Every resource should serve a clear and explicit instructional purpose.

Principle 3: Principle of Preparation:

Effective resource utilization requires advance preparation. Teachers must preview all materials before using them in class, ensure that equipment is in working order, and prepare learners for what they are about to experience. A teacher who shows a video without previewing it risks exposing learners to inappropriate content or wasting time on irrelevant material.

Principle 4: Principle of Active Engagement:

Resources should be used in ways that actively involve learners, rather than keeping them passive observers. This might involve asking learners to respond to questions, complete tasks, make observations, or discuss what they have seen or heard. Active engagement significantly improves comprehension and retention.

Principle 5: Principle of Integration:

Resources should be seamlessly integrated into the overall lesson plan, rather than added as afterthoughts. The resource should flow naturally from the lesson introduction, support the main instructional content, and connect to the follow-up activities and assessment.

Principle 6: Principle of Evaluation:

After using a resource, the teacher should evaluate its effectiveness. Did it help learners achieve the stated objectives? Were there any problems with the resource? What would be done differently next time? This reflective practice improves future resource utilization.

Principle 7: Principle of Variety:

Using a variety of resources across different lessons and within individual lessons caters to different learning styles, sustains learner interest, and reduces the risk of monotony. An overreliance on a single type of resource, such as the textbook, limits the richness of the learning experience.

Self-Assessment Exercise(s)

1. Explain four principles of effective instructional resource utilization
2. Why is preparation essential before using audiovisual materials?
3. Describe how you would apply the principle of active engagement using a chart

3.2 Barriers to Effective Resource Utilization in Educational Settings

Having understood the principles, let us now examine the barriers that hinder effective utilization of instructional resources.

Material Barriers:

One major challenge is material barriers. In many Nigerian schools, instructional resources are either insufficient, outdated, or completely unavailable. Limited funding often restricts access to quality materials.

Technical Barriers:

Technical barriers also play a significant role. Some teachers lack the necessary skills or confidence to use certain instructional technologies. For instance, a teacher unfamiliar with digital tools may avoid using them entirely.

Infrastructure Barriers:

Infrastructure barriers are equally critical. Issues such as unreliable electricity, poor internet connectivity, and inadequate classroom facilities limit the use of modern instructional resources. These challenges are particularly pronounced in rural areas.

Attitudinal Barriers:

At this point, it is important to consider attitudinal barriers. Some educators may believe that traditional methods, such as relying solely on textbooks, are sufficient. Such beliefs can limit innovation and reduce the effectiveness of teaching.

Administrative Barriers:

Administrative barriers also affect resource utilization. Large class sizes, rigid timetables, and lack of institutional support can discourage teachers from using diverse instructional materials.

Cultural and Linguistic Barriers:

Finally, cultural and linguistic barriers must not be overlooked. Instructional materials that are not aligned with learners' cultural contexts or language backgrounds may reduce comprehension and engagement. This is especially relevant in multilingual societies like Nigeria.

Self-Assessment Exercise(s)

- | |
|---|
| 1. Identify three barriers to effective resource utilization and explain them |
| 2. How do teacher attitudes influence the use of instructional resources? |
| 3. Describe two infrastructure challenges that affect instructional resource use in Nigeria |

3.3 Strategies for Overcoming Barriers to Resource Utilization

Now that you understand the barriers, let us consider practical strategies for overcoming them.

Strategy 1: Improvisation and Local Resource Development:

One of the most effective approaches is improvisation. This involves creating instructional materials using locally available resources such as cardboard, bottles, plants, and other everyday items. Improvisation not only reduces cost but also enhances cultural relevance.

Strategy 2: Teacher Professional Development:

Another important strategy is teacher professional development. Continuous training through workshops, mentoring, and peer collaboration helps teachers develop the skills and confidence needed to use diverse instructional resources effectively.

Strategy 3: Community Resource Mobilization:

Community resource mobilization is also a powerful strategy. Schools can engage parents, local artisans, and community leaders to contribute materials, expertise, and learning spaces. This strengthens the connection between schools and their communities.

Strategy 4: Collaborative Resource Production:

Collaborative resource production further enhances resource availability. Teachers can work together to design and share instructional materials, reducing individual workload and improving quality.

Strategy 5: Open Educational Resources (OER):

In addition, Open Educational Resources (OER) provide a valuable solution. Organizations such as UNESCO promote access to freely available teaching and learning materials that can be adapted to local contexts.

Strategy 6: Advocacy and Administrative Support:

Finally, advocacy and administrative support are essential. Educators must communicate the importance of instructional resources to school leaders and policymakers, advocating for improved infrastructure and resource provision.

Self-Assessment Exercise(s)

1. Define improvisation and provide two examples relevant to your subject area
2. Explain how Open Educational Resources can support teaching in Nigeria
3. How can community involvement improve instructional resource utilization?

4. Suggest three strategies you would use in a low-resource school

4.0 Conclusion

In this unit, you have explored how instructional resources can be effectively utilized to enhance teaching and learning. You have learned that effective utilization is guided by clear principles and that various barriers—ranging from material limitations to attitudinal challenges—can hinder their use. Importantly, you have also examined practical strategies for overcoming these barriers, equipping you with the skills to adapt and innovate in diverse educational contexts.

5.0 Summary

In this unit, you have learnt that effective instructional resource utilization depends on principles such as appropriateness, relevance, preparation, active engagement, integration, evaluation, and variety. You have also understood that barriers to utilization include material, technical, infrastructure, attitudinal, administrative, and cultural challenges.

Furthermore, you have seen that these barriers can be addressed through strategies such as improvisation, professional development, community resource mobilization, collaborative production, use of Open Educational Resources, and advocacy.

6.0 Tutor-Marked Assignment (TMA)

1. Explain seven principles of effective instructional resource utilization
2. Identify four barriers to resource utilization in Nigeria and propose solutions

3. Define improvisation and provide three examples relevant to your discipline
4. Explain the concept of Open Educational Resources and identify two platforms accessible to Nigerian educators
5. Discuss the role of school administrators in promoting effective resource utilization

7.0 References/Further Reading

Adeosun, O. (2010). Quality basic education development in Nigeria: Imperative for use of ICT. *Journal of International Cooperation in Education*, 13(2), 193–211.

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Module 2

Community Resources in Education

Unit 1:	Community Resources: Types, Sources, and Educational Significance
Unit 2:	Identification and Mapping of Community Resources
Unit 3:	Mobilization of Community Resources for Educational Use

Unit 1

Community Resources: Types, Sources, and Educational Significance

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3.2 Types of Community Resources

3.3 Educational Significance of Community Resources

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6.0 Tutor-Marked Assignment (TMA)

7.0 References/Further Reading

1.0 Introduction

Welcome to this unit. Having established the foundational ideas in the previous module, let us now explore a highly practical and impactful concept in education—community resources.

At this point, it is important to understand that education does not occur in isolation. The community is not merely a backdrop to schooling; rather, it serves as an active partner in the teaching and learning process. Scholars such as John Dewey emphasized that meaningful learning is rooted in real-life experiences within the learner's environment. This perspective aligns with modern educational practices supported by organizations like UNESCO, which advocate for contextualized and inclusive learning.

In this unit, you will explore what community resources are, the different types available, and their educational significance—especially within developing contexts such as Nigeria. This understanding will prepare you for practical applications in subsequent units.

2.0 Learning Outcomes

At the end of studying this unit, you should be able to:

- i. Define community resources within an educational context
- ii. Classify community resources into human and non-human categories with relevant examples
- iii. Describe the educational significance of community resources
- iv. Analyse the role of community resources in enhancing contextual and experiential learning

3.0 Main Content

3.1 Concept and Definition of Community Resources

Let us begin by examining what community resources mean in education.

A community resource refers to any person, place, organization, natural feature, material, or service within a community that can support teaching and learning. These resources are

embedded within the learner's immediate environment, making them highly relevant and accessible.

It is important to note that learning extends beyond classroom walls. The community provides authentic experiences that often make learning more meaningful. For example, instead of merely reading about agriculture, learners can visit a local farm and observe real practices.

At this point, we should distinguish between school-based resources and community resources. While school resources are intentionally designed for instructional use, community resources exist primarily for other purposes but can be adapted for education. This makes them particularly valuable in resource-constrained settings.

Community resources can also be categorized based on their origin. Some occur naturally, such as rivers and forests, while others are deliberately developed, such as libraries and health centres. Both categories offer significant learning opportunities.

Key characteristics of community resources include their local availability, accessibility, cultural relevance, diversity, and multi-purpose nature. These features make them powerful tools for enhancing instructional delivery.

Self-Assessment Exercise(s)

1. Define community resources in your own words
2. Differentiate between community resources and school-based instructional materials
3. Explain why community resources are important in resource-limited educational settings

3.2 Types of Community Resources

Having understood the concept, let us now consider the different types of community resources.

Community resources are broadly classified into human and non-human resources.

Human Community Resources:

Human community resources consist of individuals within the community who possess valuable knowledge, skills, and experiences. These individuals can actively participate in the teaching process. For instance, local farmers can demonstrate agricultural practices, while healthcare workers can provide insights into public health. Parents, artisans, traditional rulers, and local entrepreneurs also serve as important educational contributors.

Non-Human Community Resources:

Non-human community resources, on the other hand, include physical and environmental elements within the community.

Natural Resources:

Natural resources such as rivers, forests, and farmlands provide rich opportunities for experiential learning, particularly in science and geography. Physical or built resources—including markets, hospitals, and government offices—serve as real-life learning environments. Organizational resources like NGOs and community associations offer institutional support and expertise.

Physical/Built Resources:

In addition, cultural and heritage resources such as festivals, oral traditions, and artifacts play a crucial role in teaching social studies and cultural education. Locally available materials like clay, wood, and recycled items can also be used to create instructional aids.

Organizational Resources:

Community organizations including NGOs, cooperative societies, community development associations, religious organizations, and professional associations can provide support, expertise, and materials for educational activities.

Cultural and Heritage Resources:

Cultural practices, festivals, oral literature, traditional technologies, and local artifacts constitute important community resources for subjects such as social studies, cultural and creative arts, and local history.

Material Resources:

Natural materials readily available in the community such as clay, sand, leaves, seeds, wood, stones, and recycled waste can be used directly as teaching aids or as raw materials for producing improvised instructional materials.

Self-Assessment Exercise(s)

1. Classify community resources into human and non-human categories with examples
2. Identify three human community resources relevant to teaching biology in your locality
3. Describe natural resources in your community that can support environmental education

3.3 Educational Significance of Community Resources

Let us now examine why community resources are important in education.

Relevance and Contextual Learning:

One of the most significant benefits is that they promote relevance and contextual learning. When learners engage with familiar environments, they better understand and retain knowledge. For instance, using local market data in mathematics makes abstract concepts more concrete.

Cultural Affirmation and Identity:

Another important benefit is cultural affirmation. Incorporating local knowledge and practices into education validates learners' identities and promotes pride in their heritage. This is particularly important in post-colonial societies where indigenous knowledge has often been undervalued.

Bridging School and Community:

Community resources also help bridge the gap between schools and society. When community members participate in educational activities, they develop a sense of ownership and responsibility towards the school. This strengthens collaboration and improves learning outcomes.

Development of Practical Skills:

Furthermore, these resources support the development of practical skills. Learners gain hands-on experience through interaction with professionals such as artisans and farmers, thereby preparing them for real-life challenges.

Cost-Effectiveness:

Finally, community resources are cost-effective. They reduce dependence on expensive instructional materials while still providing rich and meaningful learning experiences.

Self-Assessment Exercise(s)

1. Explain four educational benefits of community resources
2. Analyse how community resources promote cultural identity in education
3. Discuss how community engagement enhances school effectiveness
4. Design a lesson that utilizes a community resource in your subject area

4.0 Conclusion

In this unit, you have explored the concept, types, and educational significance of community resources. It is evident that these resources are indispensable for creating meaningful, relevant, and engaging learning experiences. As education continues to evolve, integrating community resources remains a key strategy for improving quality and accessibility.

5.0 Summary

In this unit, you have learnt that community resources are diverse assets within the community that support education. These resources can be human or non-human and include natural, physical, organizational, cultural, and material elements. Their use enhances relevance, promotes

cultural identity, bridges school-community gaps, supports skill development, and reduces instructional costs.

6.0 Tutor-Marked Assignment (TMA)

1. Define community resources and explain their importance in education
2. Classify community resources with suitable examples
3. Explain how community resources enhance contextual learning with examples
4. Discuss the role of community resources in promoting cultural identity in Nigerian schools
5. Propose a strategy for integrating community resources into the teaching of agricultural science

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Unit 2

Identification and Mapping of Community Resources

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1.0 Introduction

2.0 Learning Outcomes

3.0 Learning Contents

3.1 Purpose and Benefits of Community Resource Mapping

3.2 Steps in Conducting a Community Resource Survey

3.3 Designing a Community Resource Inventory

4.0 Conclusion

5.0 Summary

6.0 Tutor-Marked Assignment (TMA)

7.0 References/Further Reading

1.0 Introduction

Welcome to this unit. In Unit 1, you explored the meaning, types, and educational importance of community resources. Let us now move a step further into practice by examining how these resources can be identified, documented, and organized for effective use.

At this point, it is important to recognize that many schools—especially in developing contexts—underutilize available community resources not because they are absent, but because they are not systematically identified. Educational planning bodies, including UNESCO, emphasize the importance of resource mapping as a strategy for improving access, relevance, and quality in education.

Community resource mapping is both a professional responsibility and a practical skill for teachers and educational technologists. Through a structured approach, educators can uncover valuable assets within their communities and transform them into powerful teaching tools.

In this unit, you will learn the purpose and benefits of community resource mapping, the steps involved in conducting a resource survey, and how to design a functional community resource inventory.

2.0 Learning Outcomes

At the end of this unit, you should be able to:

- i. Explain the concept, purpose, and benefits of community resource mapping
- ii. Describe the systematic steps involved in conducting a community resource survey
- iii. Design a structured community resource inventory for educational use
- iv. Analyse how resource mapping supports curriculum planning and instructional effectiveness

3.0 Main Content

3.1 Purpose and Benefits of Community Resource Mapping

Let us consider what community resource mapping entails.

Purposes of Community Resource Mapping:

Let us consider what community resource mapping entails.

Community resource mapping is a systematic process of identifying, documenting, and organizing information about available resources within a community that can support education.

The output of this process may take the form of a physical map or a structured inventory.

The purpose of this process goes beyond simple identification. First, it creates awareness among teachers and administrators about what exists within their environment. Without such awareness, valuable resources often remain unused.

Secondly, it supports deliberate integration of community resources into teaching. Rather than relying solely on textbooks, teachers can plan lessons that incorporate real-life experiences. This aligns with experiential learning principles, similar to those illustrated in the Cone of Experience by Edgar Dale.

Furthermore, resource mapping provides a reference tool that can be consulted throughout the academic year. It also strengthens school-community relationships by identifying potential collaborators such as artisans, healthcare workers, and local organizations.

It is important to note that community resource mapping offers several practical benefits. It enhances curriculum relevance, saves time during lesson preparation, promotes collaboration among teachers, and helps identify gaps in available resources. These gaps can guide future procurement or development efforts.

However, communities are dynamic. New resources emerge, and existing ones may change or disappear. Therefore, resource mapping should not be treated as a one-time activity but as a continuous process that requires periodic review and updating.

Self-Assessment Exercise(s)

- | |
|---|
| 1. Define community resource mapping in your own words |
| 2. Explain two key purposes of community resource mapping |
| 3. Discuss why resource mapping should be updated regularly |

3.2 Steps in Conducting a Community Resource Survey

Having understood its purpose, let us now examine how to carry out a community resource survey.

Step 1: Define the Purpose and Scope:

Conducting a survey requires a systematic and well-organized approach. The first step is to define the purpose and scope of the survey. At this stage, you determine what resources are needed and the geographical area to be covered. A clearly defined scope ensures that the process remains focused and manageable.

Step 2: Develop Survey Tools:

Next, appropriate survey tools must be developed. These may include questionnaires, checklists, maps, and interview guides. These tools help standardize data collection and ensure consistency.

Step 3: Identify and Brief Survey Team:

At this point, it is necessary to assemble and brief a survey team. This team may include teachers, students, and community members. Proper briefing ensures that everyone understands the objectives and methods of the survey.

Step 4: Conduct the Survey:

The actual data collection phase follows. Various techniques can be used, including direct observation, interviews with key informants, group discussions, and review of existing records. Each technique provides unique insights and helps build a comprehensive understanding of available resources.

Step 5: Organize and Document Findings:

Once data has been collected, it must be organized and documented systematically. Resources should be categorized and recorded in a structured format that is easy to access and interpret.

Step 6: Validate and Share Results:

Validation is the next critical step. Sharing findings with stakeholders allows for corrections, additional input, and increased community ownership of the process.

Step 7: Integrate Findings into Curriculum Planning:

Finally, the findings must be integrated into curriculum planning. This ensures that the identified resources are actively used in teaching and learning rather than remaining as unused data.

Self-Assessment Exercise(s)

1. Describe the importance of defining the scope before conducting a survey

2. Explain two data collection techniques used in community resource surveys

3. Why is validation an important step in the survey process?

3.3 Designing a Community Resource Inventory

Let us now turn to the practical outcome of the mapping process—the community resource inventory.

A community resource inventory is a structured document that records detailed information about identified resources. It serves as a practical tool for teachers when planning lessons and instructional activities.

A well-designed inventory includes several essential elements. Each resource entry should clearly state the name of the resource, its type, and its location. For human resources, contact information is necessary to facilitate communication.

Essential Elements of a Community Resource Inventory Entry:

- Resource Name: The name or description of the resource (e.g., 'Mr. Abubakar Ibrahim, Local Blacksmith').
- Resource Type: Human or non-human; sub-category (e.g., skilled artisan, natural environment, institutional facility).
- Location: The physical address or description of where the resource is found.

- **Contact Information:** For human resources, the name, phone number, and preferred contact method of the resource person.
- **Curriculum Relevance:** The subjects and topics for which the resource is relevant (e.g., 'Basic Technology metals and their properties').
- **Availability and Conditions:** When the resource is available, any fees or conditions attached to its use, and any special arrangements required.
- **Notes:** Any additional information, such as previous experiences of using the resource, learner feedback, or recommended preparation activities.

The inventory can be maintained as a physical binder, a spreadsheet, or a simple database. Digital formats are preferable where computer access is available, as they are easier to update and search. However, a well-maintained physical binder is perfectly adequate and has the advantage of being usable without electricity.

Sample Format for a Community Resource Inventory Entry:

Finally, a notes section provides space for additional observations, such as prior usage experiences or recommendations for effective utilization.

The format of the inventory can vary. It may be maintained as a physical document, such as a binder, or as a digital file, such as a spreadsheet or database. While digital formats offer advantages in terms of searchability and ease of updating, physical formats remain useful in contexts with limited access to technology.

At this point, it is important to emphasize that the usefulness of an inventory depends on how regularly it is updated and how easily it can be accessed by teachers.

Self-Assessment Exercise(s)

- | |
|---|
| 1. List five key elements of a community resource inventory |
| 2. Design a sample inventory entry for a resource in your community |
| 3. Analyse the advantages and limitations of digital inventories |

4.0 Conclusion

In this unit, you have learned how to systematically identify and map community resources for educational use. From understanding the purpose of resource mapping to conducting surveys and designing inventories, you now possess essential skills for integrating community assets into teaching and learning.

5.0 Summary

In this unit, you have learnt that:

1. Community resource mapping is a systematic process of identifying, documenting, and organizing community resources for educational use.
2. The survey process involves seven steps: define purpose, develop tools, brief team, conduct survey, document findings, validate results, and integrate into curriculum planning.

3. Survey techniques include direct observation, key informant interviews, focus group discussions, and review of secondary sources.
4. A community resource inventory entry should include the resource name, type, location, contact information, curriculum relevance, availability, and additional notes.
5. Community resource maps should be reviewed and updated regularly to remain accurate and useful.

6.0 Tutor-Marked Assignment (TMA)

1. Define community resource mapping and explain its importance in education
2. Describe the steps involved in conducting a community resource survey
3. Design a community resource inventory with at least five sample entries
4. Explain three techniques used in identifying community resources
5. Discuss how community resource mapping supports curriculum planning

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Unit 3

Mobilization of Community Resources for Educational Use

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3.2 Recruiting and Engaging Community Resources

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6.0 Tutor-Marked Assignment (TMA)

7.0 References/Further Reading

1.0 Introduction

Welcome to this unit. In the previous unit, you learned how to identify and map community resources. Let us now take the next logical step—mobilizing these resources for actual educational use.

At this point, it is important to understand that identifying resources is only the beginning. The real value lies in how effectively these resources are engaged to support teaching and learning. Mobilization involves building relationships, planning meaningful interactions, and ensuring that community participation becomes sustained rather than occasional.

Educational bodies such as UNESCO emphasize collaborative learning environments where schools actively engage their communities. This aligns with experiential learning principles similar to those reflected in the work of Edgar Dale, which highlight the importance of real-life experiences in enhancing learning.

In this unit, you will explore the concept and principles of community resource mobilization, examine how to recruit and engage community resources, and learn strategies for building sustainable school-community partnerships.

2.0 Learning Outcomes

At the end of this unit, you should be able to:

- i. Define community resource mobilization and explain its role in educational development
- ii. Describe the process of recruiting and engaging community resources for instructional use
- iii. Analyse key principles guiding effective community resource mobilization
- iv. Evaluate strategies for building sustainable school-community partnerships

3.0 Main Content

3.1 Concept and Principles of Community Resource Mobilization

Let us consider what community resource mobilization means.

Community resource mobilization refers to the deliberate process of engaging, organizing, and sustaining the participation of both human and non-human resources within a community for educational purposes. It goes beyond identification to active involvement, coordination, and long-term engagement.

This concept is rooted in community development, where mobilization involves encouraging collective action toward shared goals. In education, the shared goal is improved learning outcomes and more meaningful learning experiences.

Principles of Effective Community Resource Mobilization:

Principle of Mutual Benefit:

First, the principle of mutual benefit emphasizes that both the school and the community should gain from the partnership. When community members perceive value, they are more likely to remain engaged.

Principle of Respect and Dignity:

Second, the principle of respect and dignity requires that all community contributors be treated as equal partners. Individuals such as artisans, farmers, and elders possess valuable knowledge that must be acknowledged.

Principle of Clarity of Purpose:

Third, clarity of purpose is essential. Schools must clearly define what they expect from community resources to avoid misunderstandings.

Principle of Advance Planning:

Fourth, advance planning ensures that activities are well organized and meaningful. Proper scheduling, preparation, and communication are key.

Principle of Acknowledgment and Appreciation:

Finally, acknowledgment and appreciation help sustain engagement. Recognizing contributions—whether through certificates, public recognition, or simple gratitude—encourages continued participation.

Together, these principles create a strong foundation for effective and sustainable resource mobilization.

Self-Assessment Exercise(s)

- | |
|---|
| 1. Define community resource mobilization in your own words |
| 2. Explain any four principles of effective community resource mobilization |
| 3. Analyse why mutual benefit is essential for sustainability |

3.2 Recruiting and Engaging Community Resources

Having understood the principles, let us now examine how community resources can be recruited and engaged.

Step 1: Identify the Specific Need:

The process begins with identifying a specific educational need. At this stage, the teacher determines the topic, learning objectives, and type of resource required. The community resource inventory developed earlier serves as a useful guide.

Step 2: Make Initial Contact:

Next, initial contact is made with the potential resource person or organization. This should be done respectfully, clearly explaining the purpose and expectations of the engagement.

Step 3: Negotiate and Agree on Terms:

Once contact is established, both parties negotiate and agree on the terms of engagement. This includes defining roles, scheduling activities, and discussing any requirements or conditions.

Step 4: Brief and Prepare the Resource Person:

At this point, preparation becomes critical. The resource person must be briefed on the learning objectives and the learners' level of understanding. Similarly, learners should be prepared by providing background information and setting expectations.

Step 5: Prepare the Learners:

During the engagement itself, the teacher plays an active role in facilitating learning. Rather than leaving the session entirely to the resource person, the teacher guides discussions and ensures alignment with learning objectives.

Step 6: Conduct the Engagement:

During the actual engagement (whether it is a guest lecture, a field visit, a demonstration, or another activity), the teacher should remain actively involved facilitating discussion, redirecting off-topic tangents, and ensuring that learners are actively engaged rather than passively watching.

Step 7: Debrief and Follow Up:

After the activity, a debriefing session helps learners reflect on and consolidate their learning. It is equally important to follow up with the resource person, express appreciation, and document the experience for future use.

This systematic approach ensures that community engagements are purposeful, effective, and educationally meaningful.

Self-Assessment Exercise(s)

1. Describe the steps involved in recruiting a community resource
2. Why is learner preparation important before a community engagement?
3. Suggest appropriate follow-up activities after a community-based learning experience

3.3 Building Sustainable School-Community Partnerships

Let us now move beyond one-time engagements to consider long-term collaboration.

Sustainable school-community partnerships are built on trust, shared goals, and consistent interaction. Such partnerships transform community resource use from occasional activities into an integral part of educational practice.

Establishing a Community Resource Committee:

One effective strategy is the establishment of a Community Resource Committee. This committee typically includes teachers, parents, and community representatives who oversee resource-related activities and maintain relationships with community partners.

Developing Formal Memoranda of Understanding (MoUs):

Another important approach is the development of formal agreements, such as Memoranda of Understanding (MoUs). These agreements clearly outline roles, expectations, and responsibilities, ensuring stability and continuity.

Recognizing Community Contributions:

Recognition of community contributions also plays a vital role. Public appreciation through events, certificates, or school communications helps build goodwill and encourages sustained involvement.

Sharing School Resources with the Community:

At this point, it is important to emphasize reciprocity. Schools should also support the community by sharing their resources, such as libraries or facilities. This mutual exchange strengthens relationships.

Regular Communication and Feedback:

Finally, regular communication and feedback ensure that partnerships remain active and relevant. Continuous interaction helps address challenges and improve collaboration over time.

Through these strategies, schools can build enduring partnerships that enrich education and strengthen community ties.

Self-Assessment Exercise(s)

- | |
|---|
| 1. Explain the role of a Community Resource Committee |
| 2. Describe the purpose of a Memorandum of Understanding (MoU) |
| 3. Analyse how schools can sustain long-term community partnerships |

4. Design a partnership plan between a school and a local health centre

4.0 Conclusion

In this unit, you have explored how to move from identifying community resources to actively mobilizing them for educational use. You have learned that effective mobilization requires clear principles, structured processes, and sustained partnerships. When properly implemented, community resource mobilization transforms education into a more engaging, relevant, and collaborative experience.

5.0 Summary

In this unit, you have learnt that community resource mobilization involves engaging and sustaining community participation in education. It is guided by principles such as mutual benefit, respect, clarity, planning, and appreciation. The process includes identifying needs, recruiting resources, preparing participants, conducting engagements, and evaluating outcomes. Sustainable partnerships are built through structured collaboration, formal agreements, recognition, and continuous communication.

6.0 Tutor-Marked Assignment (TMA)

1. Define community resource mobilization and differentiate it from resource identification
2. Explain the principles guiding effective community resource mobilization
3. Develop a plan for engaging a community resource in a lesson of your choice

4. Draft a simple Memorandum of Understanding (MoU) for a school-community partnership
5. Suggest strategies for sustaining long-term school-community collaboration

7.0 References/Further Reading

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Module 3

Human Resources in Educational Settings

Unit 1:	Human Resources in Education: Identification and Classification
Unit 2:	Recruitment and Utilization of Human Resources
Unit 3:	Utilization of Human Resources for Teaching and Learning: Advanced Strategies

Unit 1

Human Resources in Education: Identification and Classification

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3.2 Classification of Human Resources in Educational Settings

3.3 Systematic Approaches to Identifying Human Resources

4.0 Conclusion

5.0 Summary

6.0 Tutor-Marked Assignment (TMA)

7.0 References/Further Reading

1.0 Introduction

Welcome to Module 3. In this module, we shift our focus from general community resources to a more specialized and critical category—human resources in education.

Let us consider this carefully: while materials, tools, and technologies support learning, it is people who bring learning to life. Human beings contribute experience, culture, interaction, and

adaptability in ways that no non-human resource can fully replicate. A skilled artisan demonstrating a craft, a healthcare professional explaining disease prevention, or an elder sharing cultural history all represent powerful instructional assets.

At this point, it is important to recognize that modern educational approaches—supported by organizations such as UNESCO—emphasize participatory and learner-centred education. These approaches align with social constructivist perspectives, particularly those advanced by Lev Vygotsky, which highlight the importance of social interaction in learning.

In this unit, you will explore the concept of human resources in education, examine their classification, and learn systematic approaches for identifying them within both school and community contexts.

2.0 Learning Outcomes

At the end of studying this unit, you should be able to:

- i. Define human resources in education and explain their significance
- ii. Classify human resources in educational settings into appropriate categories with examples
- iii. Describe systematic approaches to identifying human resources in schools and communities
- iv. Analyse the role of human resources in enhancing participatory and experiential learning

3.0 Main Content

3.1 Concept of Human Resources in Education

Let us begin by understanding what human resources mean within the educational context.

In general terms, human resources refer to the people who contribute to the functioning of an organization. However, in education, this concept is broader. It includes all individuals whose knowledge, skills, experiences, and relationships can support teaching and learning.

This means that human resources are not limited to teachers alone. They include school leaders, parents, community members, professionals, artisans, and even learners themselves. Each of these individuals contributes uniquely to the learning process.

Why Human Resources Matter in Education:

At this point, it is important to note a shift in educational philosophy. Traditional models viewed the teacher as the sole source of knowledge. However, contemporary approaches emphasize a participatory model in which learning is socially constructed. This aligns with the ideas of Lev Vygotsky, who argued that knowledge develops through interaction and collaboration.

Human resources are particularly valuable because they bring authenticity to learning. They provide real-life examples, respond to learners' questions in real time, and inspire learners through lived experiences. In addition, they play a vital role in transmitting cultural knowledge and sustaining learner motivation.

Thus, human resources serve as dynamic, interactive, and contextually relevant contributors to education.

Self-Assessment Exercise(s)

- | |
|--|
| 1. Define human resources in education in your own words |
| 2. Explain how human resources extend beyond formal teaching staff |

3. Analyse the relationship between participatory learning and human resource utilization

3.2 Classification of Human Resources in Educational Settings

Having understood the concept, let us now examine how human resources can be classified.

Human resources in education can be grouped based on their relationship to the school and the type of contribution they make.

Category 1: School-Based Human Resources:

First, school-based human resources include individuals formally associated with the school. These include teachers, administrators, counselors, librarians, and other support staff. They form the core instructional team.

Category 2: Parent and Family Human Resources:

Second, parent and family human resources represent a valuable but often underutilized category. Parents and family members possess diverse occupational skills and life experiences that can enrich classroom instruction. For example, a parent who is an engineer or trader can provide practical insights relevant to specific subjects.

Category 3: Community Expert Human Resources:

Third, community expert human resources include individuals within the community who possess specialized knowledge or skills. These may include farmers, artisans, traditional leaders, and local historians. Their contributions are particularly useful for contextual and vocational learning.

Category 4: Professional and Institutional Human Resources:

Fourth, professional and institutional human resources consist of individuals and organizations such as healthcare workers, university lecturers, government officials, and NGO staff. These resources provide expert knowledge and institutional support.

Category 5: Peer and Student Human Resources:

Finally, peer and student human resources highlight the role of learners themselves. Through peer tutoring, group work, and student-led activities, learners actively contribute to each other’s understanding. Research in collaborative learning strongly supports this approach.

This classification demonstrates that human resources are diverse and widely distributed across the school and community.

Self-Assessment Exercise(s)

1. Classify human resources into five categories and provide examples
2. Identify human resources relevant to teaching economics in your community
3. Explain how peer learning can enhance classroom instruction

3.3 Systematic Approaches to Identifying Human Resources

Let us now consider how these human resources can be identified systematically.

It is important to note that effective identification requires a deliberate and structured approach. Relying on chance or personal familiarity is insufficient for building a comprehensive resource base.

Approach 1: Parent and Community Surveys:

One effective approach is the use of parent and community surveys. Schools can gather information about individuals' skills, professions, and willingness to participate in educational activities. This method is inclusive and often reveals hidden expertise.

Approach 2: School-Community Network Analysis:

Another approach involves network analysis. Teachers and administrators can map their professional and social networks to identify potential resource persons within the community.

Approach 3: Key Informant Referrals:

Key informant referrals also play an important role. Community leaders, such as traditional rulers and religious leaders, often have extensive knowledge of individuals with relevant expertise and can recommend suitable resource persons.

Approach 4: Review of Existing Directories and Records:

In addition, reviewing existing records and directories—such as government databases, professional associations, and NGO reports—can provide valuable information.

Approach 5: Cross-Subject Collaboration:

At this point, collaboration among teachers becomes essential. By sharing contacts and experiences, teachers can build a more comprehensive and accessible pool of human resources.

All identified resources should be documented in a structured inventory to ensure accessibility and continuity.

Self-Assessment Exercise(s)

1. Describe three methods for identifying human resources in a school community

2. Design a simple survey for identifying community skills

3. Analyse how teacher collaboration improves resource identification

4.0 Conclusion

In this unit, you have explored the concept, classification, and identification of human resources in education. You have learned that human resources extend beyond formal teaching staff to include a wide range of contributors from the school and community. Through systematic identification and effective utilization, these resources can significantly enhance teaching and learning.

5.0 Summary

In this unit, you have learnt that human resources in education include all individuals whose knowledge, skills, and experiences support learning. These resources can be classified into school-based, parent/family, community expert, professional/institutional, and peer/student categories. Systematic identification methods such as surveys, network analysis, referrals, and collaboration help build a comprehensive resource base. Human resources enhance authenticity, interaction, cultural relevance, and learner motivation.

6.0 Tutor-Marked Assignment (TMA)

1. Define human resources in education and explain their importance
2. Classify human resources with relevant examples
3. Design a parent/community survey for identifying human resources

4. Explain systematic approaches to identifying human resources
5. Discuss how peer learning contributes to effective teaching and learning

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Unit 2

Recruitment and Utilization of Human Resources

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1.0 Introduction

Welcome to this unit. In Unit 1 of this module, you examined how human resources in education are identified and classified. Let us now move forward to an equally important stage—how these human resources are recruited and effectively utilized to enhance teaching and learning.

At this point, it is important to understand that recruitment in this context does not refer to formal employment. Rather, it involves the deliberate and respectful engagement of individuals who can contribute their knowledge, skills, and experiences to educational activities.

Effective utilization of human resources requires careful planning, communication, and pedagogical alignment. Educational frameworks promoted by organizations such as UNESCO emphasize learner-centred and experiential approaches. Similarly, the principles reflected in the Cone of Experience by Edgar Dale highlight the importance of direct, purposeful experiences in learning.

In this unit, you will learn how to recruit human resources systematically, explore strategies for utilizing them effectively, and examine common challenges along with practical solutions.

2.0 Learning Outcomes

At the end of studying this unit, you should be able to:

- i. Describe the process of recruiting human resources for educational activities
- ii. Explain strategies for effectively utilizing human resources in teaching and learning
- iii. Analyse common challenges in human resource utilization and propose solutions
- iv. Evaluate the role of planning and preparation in maximizing human resource contributions.

3.0 Main Content

3.1 Recruiting Human Resources for Educational Activities

Let us consider how human resources can be recruited for educational purposes.

Establishing the Educational Need:

The recruitment process begins with identifying a specific educational need. At this stage, the teacher reflects on the learning objectives and determines what type of expertise or experience is required. This ensures that recruitment is purposeful rather than arbitrary.

Identifying the Right Person:

Once the need is defined, the next step is identifying the most suitable individual or group. This decision should consider not only expertise but also communication ability, availability, and relevance to the learners' context.

Making a Formal Invitation:

At this point, a formal invitation is made. This invitation should clearly communicate the purpose of the engagement, the expected role, the time and venue, and any logistical arrangements. A respectful and professional approach is essential, as community members are contributing voluntarily.

Pre-Engagement Briefing:

Following acceptance, a pre-engagement briefing is necessary. During this stage, the teacher provides detailed information about the lesson objectives, learner characteristics, and expected outcomes. This preparation ensures alignment between the resource person's contribution and the instructional goals.

It is important to note that issues of compensation or appreciation should be handled transparently and sensitively. Even when financial compensation is not possible, recognition and support can serve as meaningful incentives.

Self-Assessment Exercise(s)

- | |
|---|
| 1. Describe the key steps involved in recruiting a human resource for a lesson |
| 2. What information should be included in a formal invitation? |
| 3. Analyse the importance of pre-engagement briefing in ensuring effective learning |

3.2 Strategies for Effective Utilization of Human Resources

Having recruited a human resource, let us now examine how to utilize them effectively.

Guest Lecture or Talk:

One common approach is the guest lecture, where the resource person shares knowledge or experiences. For this to be effective, the teacher must ensure that the content is appropriate for the learners' level and that learners are actively engaged.

Demonstration and Hands-On Activity:

Another powerful approach is demonstration. This method allows learners to observe practical skills in action. For example, a local artisan demonstrating a craft provides a concrete learning experience that aligns with experiential learning principles.

Panel Discussion or Forum:

Panel discussions offer opportunities for multiple perspectives. This approach is particularly useful in subjects that require critical thinking and diverse viewpoints.

Field Visit or Site Inspection:

Field visits take learning beyond the classroom. By observing real-world environments, learners gain deeper understanding and contextual awareness. However, such visits require careful planning and clear learning objectives.

Peer Tutoring and Co-Teaching:

At this point, it is important to highlight peer tutoring and mentorship. These approaches leverage learners and community members as active contributors to learning. Peer tutoring promotes collaboration, while mentorship supports long-term development and career guidance.

Mentorship Programs:

Across all these strategies, the teacher plays a crucial role as a facilitator. The teacher ensures that activities remain focused, learners are engaged, and learning objectives are achieved.

Self-Assessment Exercise(s)

- | |
|---|
| 1. Compare guest lectures and demonstrations as instructional strategies |
| 2. How should a teacher organize a field visit to ensure that it is educationally effective? |
| 3. Design a peer tutoring program for a secondary school mathematics class, outlining how peer tutors would be selected, trained, and supervised. |

3.3 Challenges in Utilizing Human Resources and Solutions

Despite the many benefits of human resource utilization in education, there are several challenges that teachers and schools commonly encounter. Being aware of these challenges and

having strategies to address them will make your practice as an educational technologist more effective.

Challenge 1: Scheduling and Availability:

One common challenge is scheduling. Community members often have other commitments, making it difficult to align with school timetables. This can be addressed through early planning and flexible scheduling.

Challenge 2: Communicating at the Learner's Level:

Another challenge relates to communication. Resource persons may not always present information at an appropriate level for learners. To address this, teachers should provide clear guidance and actively facilitate during sessions.

Challenge 3: Maintaining Learner Discipline and Engagement:

The presence of an unfamiliar visitor in the classroom may lead to disruptive learner behavior, or conversely, excessive shyness. Solution: Prepare learners in advance by explaining expectations; assign active tasks (note-taking, question-asking, observation charts) that keep learners engaged; establish clear behavioral expectations.

Challenge 4: Sustainability of Engagement:

Individual community resource persons may agree to a single engagement but be reluctant to make repeated commitments. Solution: Build genuine, appreciative relationships; formalize partnerships where appropriate; recognize contributions publicly; and diversify your pool of human resources so that no single person is overloaded.

Challenge 5: Safety and Child Protection Concerns:

When bringing adults from outside the school into contact with learners, schools have a responsibility to ensure learner safety. Solution: Verify the identity and background of resource persons before inviting them; ensure that teachers are present during all engagements; establish and communicate clear child protection policies; and follow established school protocols for hosting external visitors.

Self-Assessment Exercise(s)

1. Identify three challenges in utilizing human resources and explain their causes
2. Suggest strategies for improving communication between resource persons and learners
3. Discuss the importance of child protection in community-based learning activities

4.0 Conclusion

In this unit, you have explored the processes and strategies involved in recruiting and utilizing human resources in education. You have learned that effective utilization requires careful planning, clear communication, and active facilitation. When properly implemented, human resources can transform learning into a dynamic and meaningful experience.

5.0 Summary

In this unit, you have learnt that recruiting human resources involves identifying needs, selecting appropriate individuals, making formal invitations, and conducting pre-engagement briefings. Effective utilization strategies include guest lectures, demonstrations, panel discussions, field

visits, peer tutoring, and mentorship. Challenges such as scheduling, communication, engagement, sustainability, and safety must be addressed through thoughtful planning and professional practice.

6.0 Tutor-Marked Assignment (TMA)

1. Describe the process of recruiting a human resource for educational use
2. Compare guest lectures and field visits as instructional strategies
3. Design a mentorship program for secondary school students
4. Identify challenges in utilizing human resources and propose solutions
5. Develop a child protection guideline for engaging community resource persons

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Unit 3

Utilization of Human Resources for Teaching and Learning: Advanced Strategies

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3.2 Indigenous Knowledge Holders as Human Resources

3.3 Service-Learning: An Advanced Model for Human Resource Partnership

4.0 Conclusion

5.0 Summary

6.0 Tutor-Marked Assignment (TMA)

7.0 References/Further Reading

1.0 Introduction

Having explored the foundational concepts of human resource classification in earlier units and the processes of recruitment and basic utilization, this unit now moves into more advanced

strategies. At this stage, it is important to shift your thinking from simply *using* human resources occasionally to *strategically integrating* them into the curriculum itself.

Let us consider this carefully. Effective teaching in contemporary education—especially within Open and Distance Learning (ODL) systems—requires that learning experiences are meaningful, contextual, and connected to real-life situations. This aligns strongly with the recommendations of UNESCO, which emphasize community-based and contextually relevant learning.

Rather than treating community engagement as an optional add-on, advanced instructional practice embeds human resources directly into curriculum design, lesson planning, and assessment. In doing so, learning becomes richer, more practical, and socially relevant. Learners are not only acquiring academic knowledge but are also developing practical competencies, cultural awareness, and civic responsibility.

In this unit, you will explore how to systematically integrate human resources into curriculum planning, understand the value of indigenous knowledge holders, and examine service-learning as a powerful model for school-community collaboration.

2.0 Learning Outcomes

At the end of studying this unit, you should be able to:

- i. Explain how human resources can be systematically integrated into curriculum design and lesson planning.
- ii. Describe the educational significance of indigenous knowledge holders as human resources.
- iii. Analyse the concept of service-learning and its relevance to human resource utilization in education.

3.0 Main Content

3.1 Integrating Human Resources into Curriculum Design and Lesson Planning

At this point, it is important to understand that the most effective use of human resources does not occur by chance. Rather, it is the result of deliberate planning at the curriculum design stage. When teachers invite community members without prior planning, the experience may be interesting but lacks coherence. However, when integration is intentional, it aligns directly with learning objectives, teaching strategies, and assessment methods.

Mapping Human Resources to the Curriculum:

Let us consider how this works in practice. The first step involves reviewing the scheme of work or lesson plan and identifying specific topics where human resources can enhance learning. For example, a lesson on agriculture may benefit from the involvement of a local farmer, while a lesson on entrepreneurship may involve a business owner. These connections are then documented in a structured *community resource integration plan*, ensuring alignment with curriculum goals.

Designing Human Resource-Enriched Lesson Plans:

Furthermore, lesson plans themselves should be adapted to include human resource participation. This includes specifying who the resource person is, how learners and the resource person will prepare, the mode of engagement (such as demonstration or discussion), and how learning will be assessed.

Using Human Resources for Assessment:

It is also important to note that human resources can extend beyond teaching roles. They can participate in assessment, particularly in practical and vocational subjects. For instance, a skilled artisan evaluating students' work introduces real-world standards that enhance authenticity in assessment.

Long-Term Projects and Apprenticeships:

In addition, long-term engagement through apprenticeship-style learning provides deeper understanding. Learners benefit from sustained interaction with experts, allowing for gradual skill development and mastery. This approach aligns closely with experiential learning principles often advocated in ODL environments.

- Review curriculum and map topics to available human resources.
- Develop a community resource integration plan at department and school level.
- Adapt lesson plan formats to explicitly include human resource involvement.
- Use community experts as assessors for practical subjects.
- Design extended apprenticeship projects for vocational learning.

Self-Assessment Exercise(s)

1. Explain the difference between ad hoc use of human resources and curriculum-integrated utilization.

2. Design a simple community resource integration plan for a subject of your choice.

3. Describe how a community expert can be used as an assessor in a practical subject.

3.2 Indigenous Knowledge Holders as Human Resources

Let us now turn our attention to a category of human resources that is often overlooked but extremely valuable—indigenous knowledge holders. These include elders, traditional practitioners, and community experts who possess deep knowledge of local environments, cultural practices, and traditional technologies.

Indigenous knowledge (IK) refers to the body of knowledge developed over time through interaction with the environment. Unlike formal scientific knowledge, it is transmitted orally and through practice. This makes the individuals who hold this knowledge indispensable in educational contexts.

Educational Applications of Indigenous Knowledge Holders:

At this point, it is important to recognize that indigenous knowledge is not inferior to formal knowledge. Scholars such as Edgar Dale have emphasized the importance of experiential and contextual learning, which strongly aligns with how indigenous knowledge is transmitted.

In practical terms, indigenous knowledge holders can enrich multiple subject areas. In science, they contribute to topics such as ecology and medicinal plants. In social studies, they provide oral history and cultural narratives. In mathematics, traditional crafts can illustrate patterns and measurements—a concept often referred to as ethnomathematics.

Principles for Engaging Indigenous Knowledge Holders Respectfully:

- Approach knowledge holders with genuine respect and cultural humility.

- Seek their free, prior, and informed consent before using or sharing their knowledge.
- Acknowledge and properly credit their contributions.
- Be transparent about how their knowledge will be used in the classroom.
- Avoid presenting indigenous knowledge as inferior to or merely illustrative of formal scientific knowledge.
- Share the benefits of any resource materials produced from indigenous knowledge with the knowledge holder and community.

Integrating indigenous knowledge into formal education is not only educationally enriching but also contributes to the preservation and valorization of knowledge systems that are at risk of being lost as older generations pass away and younger generations become increasingly distanced from traditional ways of life.

Self-Assessment Exercise(s)

1. Define indigenous knowledge and explain its significance in education.
2. Identify three ways indigenous knowledge holders can contribute to science education.
3. Analyse the ethical considerations involved in engaging indigenous knowledge holders.

3.3 Service-Learning: An Advanced Model for Human Resource Partnership

Service-learning represents one of the most advanced approaches to human resource utilization in education. It combines academic learning with meaningful community service, creating a mutually beneficial relationship between schools and communities.

Let us consider what makes service-learning unique. Unlike traditional teaching methods, it is built around real community needs. Learners apply classroom knowledge to solve practical problems, working in collaboration with community members and organizations. This approach not only enhances academic understanding but also fosters empathy, responsibility, and civic engagement.

Key Characteristics of Service-Learning:

- It integrates academic learning with practical community service.
- It is organized around a genuine community need identified in collaboration with community members.
- It involves structured reflection activities that help learners connect their service experience to curriculum content.
- It benefits both the learners and the community.
- It fosters civic responsibility, empathy, and a sense of social commitment.

Service-Learning in Practice an Example:

A secondary school health science class identifies, in collaboration with the local health center, that many community members lack knowledge about malaria prevention. The class designs and produces educational posters and flyers using accurate health information, translates them into local languages with community help, and distributes them at the market and community center. Community health workers serve as human resources who verify the accuracy of the students' work and help with distribution. Through this project, learners apply their knowledge of malaria, develop communication and design skills, and make a meaningful contribution to community health.

Role of Human Resources in Service-Learning:

Community human resources play multiple roles in service-learning: as partners who help identify genuine community needs; as mentors and advisors who guide students' service activities; as validators who ensure that student work meets community standards; and as beneficiaries who provide feedback on the value and impact of the service.

Distinguishing Service-Learning from Volunteerism:

It is important to distinguish service-learning from simple volunteerism or charity. Volunteerism involves doing good for others; service-learning involves doing good for others while also learning systematically from the experience. The reflective, academic dimension which includes structured journaling, group discussion, research, and formal assessment is what transforms community service into a powerful instructional strategy.

Service-learning is particularly well-aligned with the goals of EDT 301, which emphasizes the practical development and utilization of community resources in ways that benefit both the school and the broader community.

Self-Assessment Exercise(s)

- | |
|--|
| 1. Define service-learning and explain how it differs from volunteerism. |
| 2. What roles do community human resources play in a service-learning project? |

3. Design a service-learning project for a secondary school biology or agricultural science class, identifying the community need to be addressed, the human resources to be engaged, and the learning outcomes to be achieved.

4. Why is reflection considered an essential component of service-learning?

4.0 Conclusion

In this unit, you have explored advanced strategies for utilizing human resources in education. You have seen that effective integration requires deliberate planning at the curriculum level, rather than spontaneous engagement. You have also examined the critical role of indigenous knowledge holders and the ethical considerations involved in working with them. Finally, you have been introduced to service-learning as a powerful model that transforms community engagement into a structured and meaningful learning experience.

5.0 Summary

In this unit, you have learnt that:

Curriculum integration of human resources involves aligning community resources with curriculum objectives, lesson plans, and assessment strategies.

Indigenous knowledge holders provide valuable insights into local environments, culture, and traditional practices, enriching formal education.

Ethical engagement with indigenous knowledge requires respect, consent, acknowledgment, and equitable benefit-sharing.

Service-learning integrates academic learning with community service, supported by structured reflection.

Service-learning represents a highly effective model of collaboration between schools and communities, benefiting both learners and society.

6.0 Tutor-Marked Assignment (TMA)

1. Explain the difference between ad hoc and curriculum-integrated utilization of human resources in education.
2. Design a community resource integration plan for a term in secondary school social studies.
3. Discuss the concept of indigenous knowledge and explain how it can be integrated into science education ethically.
4. Develop a service-learning project, clearly identifying objectives, activities, human resources, and reflection strategies.
5. Explain how community experts can be used as assessors in vocational education.

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Module 4

Non-Human Resources in Educational Settings

Unit 1:	Non-Human Resources: Printed and Visual Materials
Unit 2:	Non-Human Resources: Audio, Audiovisual, and Electronic Materials
Unit 3:	Real Objects, Models, and Environmental Resources

Unit 1

Non-Human Resources: Printed and Visual Materials

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3.2 Printed Instructional Materials

3.3 Visual (Non-Projected) Instructional Materials

4.0 Conclusion

5.0 Summary

6.0 Tutor-Marked Assignment (TMA)

7.0 References/Further Reading

1.0 Introduction

Welcome to Module 4. Having previously examined human resources in education, we now shift our focus to non-human instructional resources. At this point, it is important to recognize that effective teaching does not rely solely on the teacher or other human contributors; rather, it also depends significantly on the materials and tools that support instruction.

Non-human resources refer to the physical, material, and environmental tools used in teaching and learning. These range from simple tools such as chalkboards and printed charts to more advanced materials such as digital media. They represent the most visible and tangible elements of instructional delivery, as learners can directly see, handle, and interact with them.

Let us consider this carefully. When properly selected and utilized, these resources transform abstract ideas into concrete experiences, making learning more meaningful and engaging. This aligns with the experiential learning perspective emphasized by Edgar Dale, who highlighted the importance of visual and direct experiences in improving retention and understanding.

This unit specifically focuses on printed and visual (non-projected) materials, which remain the most accessible and widely used instructional resources in Nigerian educational contexts.

2.0 Learning Outcomes

At the end of studying this unit, you should be able to:

- i. Define non-human instructional resources and explain their importance in education.
- ii. Describe the major types of printed instructional materials and their educational applications.
- iii. Analyse the major types of visual (non-projected) instructional materials and their educational applications.

3.0 Main Content

3.1 Non-Human Resources: Definition and Overview

Non-human instructional resources are all physical, material, and environmental tools used in teaching and learning without direct human involvement as the primary source of instruction.

These resources serve as extensions of the teacher, enabling more effective communication of knowledge.

At this point, it is important to note that learning becomes more effective when multiple senses are engaged. Non-human resources provide alternative ways of presenting information, thereby supporting learners with different learning preferences. This multi-modal approach—combining visual, auditory, and tactile experiences—has been widely recognized as a powerful strategy for improving learning outcomes.

General Classification of Non-Human Resources:

- Printed materials: Textbooks, workbooks, handouts, charts, posters, newspapers, magazines.
- Visual (non-projected) materials: Chalkboards, whiteboards, flannel boards, bulletin boards, photographs, diagrams, maps, globes.
- Audio materials: Radio broadcasts, audio recordings, podcasts, musical recordings.
- Audiovisual materials: Films, television programs, videos, multimedia presentations.
- Electronic/digital materials: Computers, tablets, educational software, e-books, internet resources.
- Real objects and specimens: Actual objects from the natural world or human environment used for direct observation.
- Models and simulations: Three-dimensional representations of real objects, processes, or systems.
- Environmental resources: The natural and built environment used as a learning setting.

Self-Assessment Exercise(s)

1. Define non-human instructional resources and provide examples from at least six categories.
2. Explain why multi-modal instruction is more effective than verbal-only teaching.
3. Identify the most accessible category of non-human resources in Nigerian schools and justify your choice.

3.2 Printed Instructional Materials

Printed instructional materials remain the backbone of educational systems worldwide. Despite the increasing presence of digital technologies, printed resources continue to play a critical role due to their accessibility, affordability, and ease of use.

Textbooks:

Let us examine the major types of printed materials and their instructional relevance. The textbook serves as the central resource in most classrooms, providing structured and sequential content aligned with the curriculum. However, it is important to note that textbooks alone are not sufficient, as they may become outdated or fail to reflect local contexts adequately.

Workbooks and Exercise Books:

Workbooks and exercise books complement textbooks by providing opportunities for active learner engagement. Through structured exercises, learners can practice concepts and assess their understanding.

Instructional Charts and Diagrams:

Charts and diagrams offer visual representations of information, making complex relationships and processes easier to understand. For example, a life cycle chart or a classification diagram helps learners visualize sequences and connections.

Posters:

Posters, on the other hand, are designed to communicate key messages in a visually appealing format. They are particularly effective for reinforcing important concepts or promoting awareness on issues such as health and safety.

Newspapers and Magazines:

Current newspapers and magazines are valuable instructional resources, particularly for current affairs, language education, and media literacy. They connect classroom learning to real-world events and provide authentic texts for reading and analysis activities. In a resource-limited environment, donated newspapers and magazines can serve as free instructional materials.

Handouts and Resource Sheets:

Teacher-produced handouts provide learners with focused, lesson-specific information, practice activities, or reference material. They can be produced inexpensively using a typewriter, computer, or handwriting, and duplicated using a photocopier or spirit duplicator. Handouts are highly flexible and can be tailored precisely to the needs of a specific class.

Self-Assessment Exercise(s)

1. Identify six types of printed instructional materials and explain their uses.

2. Analyse the strengths and limitations of textbooks in secondary education.

3. How can newspapers and magazines be used as instructional resources in a secondary school English language class? Describe a specific lesson activity.

3.3 Visual (Non-Projected) Instructional Materials

Visual non-projected materials are instructional tools that communicate information through images, symbols, and spatial representations without requiring electronic devices. These materials are particularly valuable in resource-limited environments due to their affordability and ease of use.

Chalkboard and Whiteboard:

The chalkboard or whiteboard remains one of the most widely used instructional tools. It allows teachers to present information dynamically, illustrate concepts step by step, and involve learners actively in the lesson. Effective use requires clarity, organization, and proper spacing.

Flannel Board (Flannelgraph):

A flannel board is a display surface covered with flannel or felt cloth, to which cut-out figures and shapes (backed with rough material) can be attached and rearranged. Flannel boards are particularly useful in primary education for storytelling, teaching sequence and classification, and building vocabulary, because they allow dynamic, interactive displays that can be changed as the lesson progresses.

Bulletin Board:

A bulletin board is a display surface (typically cork or soft board) used to display learner work, current information, resources, and reference materials. When well-maintained and regularly updated, bulletin boards enrich the classroom environment and support incidental learning the learning that occurs when learners notice and engage with materials outside of formal lesson time.

Maps and Globes:

Maps and globes are specialized visual tools essential for geography, social studies, and history education. They present spatial relationships, territorial boundaries, physical features, and cultural information in a visual format that enables learners to develop spatial thinking and geographic literacy.

Photographs and Illustrations:

Photographs and illustrations provide visual representations of objects, people, places, events, and processes that learners may not be able to observe directly. They make abstract or distant phenomena concrete and accessible. Large-format photographs and illustrations can be mounted and displayed in the classroom; smaller versions can be distributed as handouts or included in teacher-produced worksheets.

Graphic Organizers:

Graphic organizers including concept maps, mind maps, Venn diagrams, story maps, KWL charts, and flow charts are visual frameworks that help learners organize, connect, and represent information. They are particularly effective for developing higher-order thinking skills such as analysis, synthesis, and evaluation.

Self-Assessment Exercise(s)

1. Describe four visual non-projected materials and their classroom applications.
2. What are the principles of effective chalkboard use? Why is the chalkboard still relevant in Nigerian classrooms despite the availability of digital alternatives?
3. Illustrate how graphic organizers can enhance higher-order thinking with an example.

4.0 Conclusion

In this unit, you have explored non-human instructional resources as a critical component of effective teaching and learning. You have examined their definitions, classifications, and educational significance, with particular emphasis on printed and visual materials.

It is important to note that these resources form the everyday instructional toolkit for most educators. Their effective use requires careful planning, alignment with learning objectives, and consideration of learners' needs.

5.0 Summary

In this unit, you have learnt that:

Non-human instructional resources are physical and material tools that support teaching and learning.

Printed materials include textbooks, workbooks, charts, posters, newspapers, and handouts, each serving specific instructional purposes.

Visual non-projected materials include chalkboards, flannel boards, bulletin boards, maps, photographs, and graphic organizers.

Multi-modal instruction enhances learning by engaging multiple senses.

The selection and use of instructional materials must align with educational objectives and learner characteristics.

6.0 Tutor-Marked Assignment (TMA)

1. Define non-human instructional resources and provide a detailed classification with examples.
2. Describe six types of printed instructional materials and their educational applications.
3. Analyse the strengths and limitations of textbooks in Nigerian secondary schools.
4. Explain how visual non-projected materials can support teaching in a subject of your choice.
5. Design a lesson plan incorporating at least three non-human instructional materials.

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Unit 2

Non-Human Resources: Audio, Audiovisual, and Electronic Materials

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6.0 Tutor-Marked Assignment (TMA)

7.0 References/Further Reading

1.0 Introduction

In Unit 1, you explored printed and visual non-projected instructional materials. In this unit, we extend that knowledge by examining three important categories of non-human instructional resources: audio materials, audiovisual materials, and electronic/digital materials.

Let us consider how these resources have become increasingly significant in contemporary education. In the Nigerian context, technologies such as mobile phones, radio broadcasting, and community television now serve as vital channels for delivering educational content. While access to these technologies varies widely—particularly between urban and rural schools—it is important for you, as an educational technologist, to understand their characteristics, applications, and limitations.

At this point, it is important to note that a solid understanding of these resources will not only help you make informed instructional decisions but will also prepare you for later modules where you will design and improvise instructional materials. Your ability to effectively use audio and visual principles will directly influence the quality of learning experiences you create.

2.0 Learning Outcomes

At the end of this unit, you should be able to:

- i. Describe the characteristics of audio instructional materials
- ii. Explain the educational applications of audio instructional materials
- iii. Describe the characteristics of audiovisual instructional materials
- iv. Analyse the educational applications of audiovisual instructional materials
- v. Explain the role of electronic and digital resources in contemporary education
- vi. Evaluate the use of electronic and digital instructional resources within the Nigerian context

3.0 Main Content

3.1 Audio Instructional Materials

Audio instructional materials are resources that communicate information primarily through sound. These may include speech, music, environmental sounds, or a combination of these elements. They engage the auditory channel of learning and are especially useful in contexts such as language learning, music education, and oral storytelling traditions.

Radio Broadcasts:

Let us consider the Nigerian context. Radio broadcasting has played a significant role in education. Institutions such as the Federal Radio Corporation of Nigeria have historically delivered educational programs, including school lessons, agricultural education, and public health campaigns. Radio remains particularly valuable because it is affordable, widely accessible, and compatible with oral communication traditions, especially in rural areas.

Audio Recordings:

Pre-recorded audio content on cassette tapes (still used in some schools), CDs, or digital audio files accessible via mobile phones or computers enables teachers to bring expert voices, authentic dialogues, musical performances, oral literature, and documentary content into the classroom. Audio recordings can be played repeatedly, paused for discussion, and used by individual learners for self-paced study.

Podcasts:

In addition to radio, pre-recorded audio materials—such as cassette tapes, CDs, and digital audio files—enable teachers to bring diverse voices and authentic content into the classroom. These

materials allow for repetition, pausing, and individualized learning, making them highly adaptable.

Principles for Effective Audio Resource Use:

- Preview all audio materials before use to verify their appropriateness and relevance.
- Prepare learners by providing a focused listening task before playing the audio.
- Use pauses strategically to allow discussion and processing of key points.
- Follow up with activities that connect the audio content to lesson objectives.
- Ensure audibility check that all learners can hear clearly before beginning.

Self-Assessment Exercise(s)

1. Describe three types of audio instructional materials and explain their educational advantages
2. Explain why radio broadcasting is particularly valuable in rural Nigerian communities
3. Design a listening activity suitable for a secondary school English class

3.2 Audiovisual Instructional Materials

Audiovisual materials combine both sound and visual elements, thereby engaging multiple sensory channels simultaneously. This dual engagement often leads to deeper understanding and improved retention.

Research in multimedia learning, particularly by Richard Mayer, demonstrates that well-designed audiovisual materials enhance learning outcomes when compared to single-channel resources.

Educational Television and Video:

Television programs and video recordings have been used extensively in Nigerian education, particularly through the Instructional Television (ITV) programs produced by the Nigerian Television Authority (NTA) and state television networks. Video programs can bring distant environments, historical events, scientific experiments, cultural performances, and expert demonstrations into the classroom. Key advantages include the ability to show processes in motion, to zoom in on fine details, and to replay segments for deeper analysis.

Documentary Films:

Documentaries on topics relevant to the curriculum ecology, history, social issues, science, and culture provide learners with in-depth, visually rich engagement with real-world subjects. With increased smartphone penetration in Nigeria, documentary content is increasingly accessible via YouTube and other platforms even without a television screen, using mobile data or downloaded content.

Multimedia Presentations:

Digital presentation software (such as Microsoft PowerPoint or LibreOffice Impress) enables teachers to create audiovisual presentations combining text, images, diagrams, video clips, and audio elements. When used well with clear visuals, minimal text, and appropriate audio multimedia presentations can effectively support and enhance verbal instruction. When poorly designed (dense text slides read aloud by the teacher), they actively hinder learning.

Animations and Simulations:

Computer-generated animations can illustrate processes that are invisible to the naked eye (such as molecular reactions, cellular processes, or weather pattern formation) or that occur too slowly or quickly for direct observation. Simulations allow learners to experiment with variables and observe outcomes in a safe, controlled digital environment. These resources are increasingly available as free or low-cost educational software and mobile apps.

Mayer's Multimedia Learning Principles (Selected):

- Coherence Principle: Learning is better when extraneous material is excluded.
- Signaling Principle: Learning is better when cues highlight the organization of key information.
- Redundancy Principle: Learning is better from graphics and narration than from graphics, narration, and on-screen text.
- Contiguity Principle: Learning is better when words and pictures are presented simultaneously rather than sequentially.
- Segmenting Principle: Learning is better when a lesson is presented in segments rather than as a continuous unit.

Self-Assessment Exercise(s)

1. Explain the advantages of audiovisual materials over single-mode instructional resources
2. Evaluate a classroom presentation using multimedia learning principles and suggest improvements

3. Describe how documentary films can be used effectively in a secondary school lesson

3.3 Electronic and Digital Instructional Resources

Electronic and digital instructional resources represent a rapidly expanding area in education. These include computers, tablets, smartphones, educational software, e-books, and online learning platforms.

At this point, it is important to note that digital literacy has become an essential skill for both teachers and learners. Organizations such as UNESCO continue to emphasize the importance of integrating digital technologies into education.

Computers and Tablets:

Computers and tablets enable learners to access a vast range of educational software, simulations, reference databases, and creative tools. Computer-based learning can be highly individualized adapting to each learner's pace, level, and learning style and can provide immediate feedback on practice activities. In schools with functioning computer laboratories, computers are particularly valuable for teaching technology, sciences, languages, and business studies.

Educational Software and Applications:

Educational software ranges from drill-and-practice programs (for mathematics, spelling, and language skills) to complex simulations, reference encyclopedias, creative tools, and interactive storybooks. Many high-quality educational applications are available free of charge for Android devices, making them accessible on the smartphones that are increasingly common even in low-income Nigerian communities.

E-Books and Digital Libraries:

Electronic books (e-books) and digital library platforms provide access to a vast range of educational content without the cost, weight, or storage requirements of physical books. Platforms such as the African Storybook Project, Project Gutenberg, and the NOUN digital library provide free educational content relevant to Nigerian learners.

The Internet and Online Learning Platforms:

The internet provides access to an essentially unlimited range of educational content from Wikipedia and Khan Academy to specialized academic databases and national curriculum resources. Online learning platforms such as Google Classroom, Moodle, and various Nigerian e-learning initiatives enable blended and distance learning. The COVID-19 pandemic dramatically accelerated the adoption of online learning in Nigeria, though significant challenges of connectivity, device access, and digital literacy remain.

Mobile Learning (m-Learning):

The smartphone is increasingly the primary digital device for many Nigerians. Mobile learning leverages this reality to deliver educational content via SMS, WhatsApp, mobile apps, and mobile-optimized websites. Mobile learning is particularly promising for reaching learners in areas with limited fixed internet infrastructure, as mobile networks often extend further than fixed broadband.

Challenges of Electronic Resources in Nigerian Schools:

- Unreliable or absent electricity supply limits the use of electronic devices.
- High cost of devices and data restricts access, particularly for learners from low-income households.

- Limited teacher capacity to integrate digital resources effectively into instruction.
- Risk of distraction and misuse of internet-connected devices.
- Content relevance: much digital content is designed for Global North contexts and may be culturally or linguistically inappropriate.

Self-Assessment Exercise(s)

1. Identify four electronic or digital instructional resources and describe their uses

2. Explain three challenges affecting the use of digital resources in Nigerian schools

3. Suggest practical ways mobile phones can be used for learning in resource-limited environments

4.0 Conclusion

In this unit, you have explored audio, audiovisual, and electronic/digital instructional resources.

You have examined their characteristics, applications, and relevance within the Nigerian educational context.

You have also engaged with multimedia learning principles and reflected on the opportunities and challenges associated with digital technologies. This knowledge provides a strong foundation for your future work in designing and utilizing instructional materials.

5.0 Summary

In this unit, you have learnt that audio instructional materials include radio broadcasts, recordings, and podcasts, all of which are particularly valuable in contexts where oral communication is dominant.

You have also learnt that audiovisual materials enhance learning by engaging multiple senses, and that their effectiveness can be guided by established multimedia principles.

Furthermore, you have examined electronic and digital resources, including computers, software, e-books, and online platforms, as well as the growing importance of mobile learning in Nigeria.

Finally, you have considered the challenges associated with digital resource use, including infrastructure limitations, cost, and capacity issues.

6.0 Tutor-Marked Assignment (TMA)

1. Compare and contrast audio and audiovisual instructional materials in terms of their characteristics and educational applications
2. Using multimedia learning principles, design guidelines for an effective educational video for a Nigerian secondary school biology class
3. Discuss the opportunities and challenges of integrating digital resources into Nigerian secondary education
4. Explain how mobile phones can be effectively and safely used as learning tools in resource-limited schools
5. Evaluate the benefits and risks of using internet resources in secondary school education

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Unit 3

Real Objects, Models, and Environmental Resources

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3.3 The Environment as an Instructional Resource

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6.0 Tutor-Marked Assignment (TMA)

7.0 References/Further Reading

1.0 Introduction

Having explored printed, visual, audio, audiovisual, and electronic resources in the previous units, let us now complete this module by examining three additional and highly significant categories of non-human instructional resources: real objects (realia), models, and environmental resources. These resources occupy a unique position in educational technology because they

offer the most concrete and direct learning experiences. In fact, they are situated at the “real” end of Edgar Dale’s Cone of Experience, which emphasizes that learners understand best through direct, purposeful engagement.

At this point, it is important to note that in many educational systems, including that of UNESCO member states such as Nigeria, teaching is still largely theoretical and text-based. This often leads to rote memorization rather than meaningful understanding. The deliberate integration of real objects, models, and environmental resources therefore becomes essential for promoting experiential learning, skill acquisition, and deeper conceptual understanding.

This unit will guide you through what these instructional resources are, why they are pedagogically important, and how they can be effectively integrated into teaching and learning processes.

2.0 Learning Outcomes

At the end of studying this unit, you should be able to:

- i. Define real objects (realia) and explain their educational significance
- ii. Describe models and simulations as instructional resources
- iii. Analyse different types of models used in teaching and learning
- iv. Explain how environmental resources can be utilized for instructional purposes
- v. Design simple learning experiences using real objects, models, and environmental resources

3.0 Main Content

3.1 Real Objects (Realia) as Instructional Resources

Let us consider the concept of real objects, commonly referred to as *realia* in educational technology. These are actual objects from the real world used directly for instructional purposes. Unlike representations such as charts or models, realia are the objects themselves—examples include rock samples, plants, tools, currency notes, or food items.

The educational value of realia lies in their ability to provide direct, multi-sensory experiences. When learners can see, touch, and sometimes even smell or manipulate an object, they develop richer and more lasting understanding. For instance, examining a real leaf allows learners to observe texture, venation, and colour variations in ways that no diagram can fully replicate.

It is important to note that this principle forms the foundation of laboratories, workshops, farms, and other practical learning environments. Through interaction with real objects, learners develop observation, classification, and analytical skills while also increasing their motivation and curiosity.

Categories of Realia:

- Natural specimens: Rocks, minerals, soil samples, plant specimens (leaves, seeds, bark, roots), animal specimens (preserved or living), water samples, and shells.
- Cultural artifacts: Traditional tools, instruments, textiles, pottery, sculptures, ceremonial objects, and currency.
- Technological objects: Mechanical components, electronic components, simple machines, and consumer goods.
- Mathematical manipulatives: Counting objects, geometric shapes, measurement tools, and abacuses.

- Commercial products: Food items, medicines, consumer goods, and packaging used to illustrate economic, chemical, or biological concepts.

Advantages of Realia:

Realia provide authentic, multi-sensory learning experiences; promote observation, description, and classification skills; stimulate curiosity and intrinsic motivation; support learners with different learning styles; and make abstract concepts concrete and accessible.

Limitations of Realia:

Not all objects can be safely or practically brought into the classroom (dangerous chemicals, large animals, historical artifacts). Some realia are fragile, perishable, or scarce. Small objects may be difficult for all learners to observe simultaneously. Preserving biological specimens requires specific knowledge and materials.

When real objects cannot be used for reasons of safety, size, rarity, or fragility models and simulations provide valuable alternatives.

Self-Assessment Exercise(s)

1. Define realia and provide five examples relevant to science education
2. Explain how real objects enhance learners' understanding using a practical example
3. Identify two limitations of realia and suggest appropriate alternatives

3.2 Models and Simulations as Instructional Resources

When real objects are inaccessible, unsafe, too large, too small, too expensive, or no longer in existence, models and simulations provide the next best alternative. A model is a three-dimensional representation of a real object or system, designed to illustrate its structure, function, or operation. Models can be either commercial (purchased from educational suppliers) or improvised (produced by teachers or learners from locally available materials).

Types of Models:

- Solid models: Three-dimensional representations of objects in their natural or stylized form (e.g., a model of the human heart, a model of the solar system, a model of a molecule).
- Cutaway models: Models that reveal internal structure by removing a section of the outer surface (e.g., a cutaway model of the human eye or a car engine).
- Working models: Models that replicate the functional operation of a device or system (e.g., a model windmill that generates electricity, a model dam, or a working mechanical clock).
- Mock-ups: Simplified models that emphasize key functional elements while omitting non-essential details (e.g., a model keyboard or control panel for training purposes).
- Dioramas: Three-dimensional scene reproductions depicting a historical event, ecological environment, or cultural setting.

Improvised Models:

One of the most important skills for an educational technologist working in resource-limited settings is the ability to design and produce improvised models using locally available materials. A model of a cell can be constructed from readily available materials such as a plastic bag, gelatin, dried seeds, and a grape; a model of the water cycle can be created using a sealed transparent bag, water, and a heat source; and a model of a traditional compound can be built using clay, sticks, and leaves. The production of improvised models is a form of creative problem-solving that also engages learners actively when they participate in construction.

Simulations:

Simulations are structured activities or digital programs that replicate real-world processes or events in a simplified, safe, or controlled environment. Role-play simulations (such as a model court proceeding, a mock parliament session, or a simulated patient consultation) provide learners with opportunities to practice complex real-world skills. Computer-based simulations (such as virtual laboratory experiments or economic modeling tools) extend this capability to domains that would otherwise be inaccessible.

Self-Assessment Exercise(s)

1. Define models and describe four types with examples
2. How can improvised models be produced from locally available materials in a Nigerian secondary school? Give two specific examples.
3. What is the difference between a model and a simulation? Give an example of each from secondary school education.

3.3 The Environment as an Instructional Resource

The natural and built environment constitutes one of the richest and most underutilized instructional resources available to schools. The school compound itself, the surrounding neighborhood, local farmland, water bodies, forests, markets, health facilities, and government offices all offer authentic learning contexts that no classroom-based resource can fully replicate.

The School Environment:

The school compound is often overlooked as an instructional resource, yet it provides immediate access to a wide range of learning opportunities. A school garden teaches agricultural science, biology, and nutrition. The school building itself can teach architecture, measurement, and materials science. The school's community life can be studied through the lens of sociology, civic education, and economics.

The Local Natural Environment:

Rivers and streams offer resources for biology (aquatic ecosystems, water quality testing), geography (drainage, erosion), and physics (water pressure, flow rate). Forests and farmland support ecology, biodiversity studies, and agricultural science. Rock outcrops, soil profiles, and mineral deposits support earth science and geography. Even the urban environment with its building materials, traffic patterns, and commercial activities is a rich resource for physics, geography, economics, and social studies.

Community Built Environment:

As discussed in Module 2, community facilities hospitals, markets, government offices, factories, workshops, and cultural centers are rich instructional environments for a wide range of subjects. Organizing field visits to these settings provides learners with authentic, contextual learning experiences that deepen understanding and develop practical awareness.

Organizing Effective Environmental Learning Experiences:

To ensure that environmental learning experiences are educationally productive, teachers must plan them carefully. This includes defining clear learning objectives; conducting a preliminary site visit to identify risks and learning opportunities; preparing structured observation guides or task sheets for learners; arranging appropriate supervision; and conducting a thorough post-activity debriefing to consolidate learning.

- Define clear learning objectives before the environmental activity.
- Conduct a preliminary site visit for safety and opportunity assessment.
- Prepare structured observation guides and task sheets for learners.
- Ensure adequate supervision and safety measures.
- Conduct structured debriefing and follow-up activities after the experience.
- Document the experience for inclusion in the school's resource records.

Self-Assessment Exercise(s)

1. Explain how the school environment can be used as an instructional resource. Give three specific examples from different subject areas.

2. What are the steps involved in organizing an effective environmental learning experience (field visit)? Describe each step.

3. A biology teacher plans to use a nearby stream as an instructional resource for a lesson on aquatic ecosystems. Plan the lesson, including preparation, the field activity, and the follow-up.

4.0 Conclusion

In this unit, you have explored some of the most concrete and impactful instructional resources available in educational technology. Real objects provide direct sensory experiences, models and simulations offer practical alternatives where real objects are not feasible, and the environment presents authentic learning contexts that extend beyond the classroom.

Together, these resources support experiential learning and help bridge the gap between theory and practice.

5.0 Summary

In this unit, you have learnt that real objects, also known as realia, are authentic materials that provide direct and multi-sensory learning experiences. You have also learnt that models serve as representations of real systems and can take various forms, including solid, working, and improvised models. Furthermore, simulations allow learners to experience real-world processes in safe and controlled environments.

Finally, you have understood that the environment—both natural and built—offers rich, contextual learning opportunities, provided that such experiences are carefully planned and structured.

6.0 Tutor-Marked Assignment (TMA)

1. Define realia and explain their educational importance with relevant examples
2. Describe four types of models and their applications in teaching
3. Explain how improvised models can be constructed using local materials
4. Design a field-based learning activity using the local environment
5. Compare realia, models, and diagrams in teaching a science concept

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Module 5

Design Principles for Instructional Materials

Unit 1:	Foundations of Instructional Design: Concepts and Theories
Unit 2:	Basic Design Principles for Instructional Charts, Posters, and Displays
Unit 3:	Designing for Learner Diversity and Inclusion

Unit 1

Foundations of Instructional Design: Concepts and Theories

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3.2 Learning Theories and Their Implications for Instructional Design

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6.0 Tutor-Marked Assignment (TMA)

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1.0 Introduction

Welcome to this unit. Having explored instructional resources in earlier modules, let us now shift our attention from merely using existing materials to designing and producing effective instructional materials. This transition—from consumer to creator—is a defining moment in your development as an educational technologist.

At this point, it is important to note that effective instructional material design is not based solely on creativity or intuition. Rather, it is grounded in established theories of learning and cognition, informed by a deep understanding of learner characteristics, and guided by systematic principles of communication and message design.

An instructional designer who understands these foundations is able to create materials that do more than appear attractive—they actively support learning. Organizations such as UNESCO emphasize the importance of structured, theory-driven instructional development in improving educational quality globally.

This unit therefore introduces you to the foundational concepts and theories that underpin instructional design, providing the intellectual framework upon which your practical design skills will be built.

2.0 Learning Outcomes

At the end of studying this unit, you should be able to:

- i. Define instructional design and explain its importance in educational material development
- ii. Describe major learning theories that inform instructional design practice
- iii. Analyse the relationship between instructional design and educational technology
- iv. Explain key principles of message design in instructional materials

3.0 Main Content

3.1 Concept and Importance of Instructional Design

Let us consider what instructional design entails. Instructional design (ID) refers to the systematic process of developing instructional materials, activities, and learning experiences that

effectively achieve specific learning objectives. It is both a field of study and a professional practice that integrates knowledge from learning theories, communication, cognitive psychology, and curriculum studies.

The term “design” is particularly significant. It implies a deliberate and structured process rather than an improvised approach. For instance, a teacher who informally delivers content without planning is engaging in intuitive instruction. In contrast, an instructional designer carefully analyses learner needs, defines measurable objectives, selects appropriate strategies and media, develops materials, and evaluates their effectiveness.

Key Characteristics of Instructional Design:

- **Learner-centered:** Begins with an analysis of who the learners are and what they need.
- **Objective-driven:** Guided by clearly stated, measurable learning objectives.
- **Systematic:** Follows a structured process with defined phases and decision points.
- **Evidence-based:** Informed by research on how people learn and what makes instruction effective.
- **Iterative:** Involves continuous testing, evaluation, and revision.
- **Context-sensitive:** Takes into account the instructional setting, available resources, and cultural factors.

The importance of instructional design for educational material development lies in its capacity to ensure that materials are not just visually appealing or informative but genuinely effective at producing the intended learning outcomes. A well-designed instructional material is one where every design decision—the choice of words, images, color, format, sequence, and practice activities—has been made with the learner and the learning objective in mind.

Self-Assessment Exercise(s)

1. Define instructional design and distinguish it from informal instructional practices
2. Identify and explain key characteristics of instructional design
3. Analyse why instructional design is essential in resource-constrained educational environments

3.2 Learning Theories and Their Implications for Instructional Design

Instructional design is deeply rooted in theories of how people learn. Let us examine three major theoretical perspectives: behaviourism, cognitivism, and constructivism.

Behaviourism:

Behaviourism, associated with psychologists such as Pavlov, Thorndike, and B.F. Skinner, focuses on observable behaviors and the role of reinforcement in shaping learning. From a behaviourist perspective, learning occurs when a learner produces a correct response to a stimulus and receives positive reinforcement. Instructional design implications of behaviourism include: breaking complex skills into small, sequenced steps; providing immediate feedback on learner responses; using frequent practice and repetition; and rewarding correct responses with praise, marks, or other reinforcers. Drill-and-practice software and programmed instruction are examples of instructional materials designed on behaviourist principles.

Cognitivism:

Cognitivism emerged as a response to the limitations of behaviourism, shifting focus from observable behavior to internal mental processes. Cognitivist theorists such as Piaget, Ausubel, and Bruner emphasized that learning involves the active processing, organization, and storage of information in memory. Instructional design implications of cognitivism include: organizing content logically and hierarchically; activating learners' prior knowledge before introducing new content (advance organizers); using examples, analogies, and mnemonics to aid memory; reducing cognitive load by presenting information in manageable chunks; and using visual organizers to make the structure of content visible.

Constructivism:

Constructivism, associated with Vygotsky, Dewey, and more recently Papert, holds that learners actively construct their own understanding through experience, reflection, and social interaction. Knowledge is not transmitted from teacher to learner; it is built by the learner in interaction with their environment and peers. Instructional design implications of constructivism include: providing authentic, problem-based learning experiences; encouraging collaborative learning and peer discussion; giving learners control over their learning paths; using reflection activities that prompt learners to make connections between new and prior knowledge; and valuing diverse approaches and solutions.

Implications of All Three Theories for Material Design:

- Behaviourism: Use clear objectives, sequenced instruction, and immediate feedback.
- Cognitivism: Organize content clearly, reduce cognitive load, use advance organizers.
- Constructivism: Embed content in authentic contexts, encourage collaboration and reflection.

Self-Assessment Exercise(s)

- | |
|---|
| 1. Briefly describe behaviourism, cognitivism, and constructivism as learning theories. |
| 2. Identify two instructional design implications for each theory |
| 3. Evaluate which theory is most applicable to locally produced instructional materials and justify your choice |

3.3 Principles of Message Design in Instructional Materials

Beyond learning theories, instructional designers must also consider how information is communicated. Message design refers to the deliberate structuring of words, images, and symbols to convey meaning effectively.

At this point, let us consider some key principles.

Principle of Clarity:

The primary goal of any instructional message is to be understood. Clarity requires using simple, unambiguous language appropriate to the learner's level; organizing information in a logical sequence; and avoiding unnecessary complexity. Every element of an instructional material every word, image, diagram, and layout decision should serve the goal of making the content as clear as possible.

Principle of Emphasis:

Important information must stand out from surrounding content. Design techniques for achieving emphasis include the use of bold or larger text for key terms; color highlights; boxes or borders

around key information; and strategic use of white space to isolate and draw attention to critical elements.

Principle of Unity and Coherence:

All elements of an instructional material should work together to create a coherent, unified message. Visual design elements (colors, fonts, layouts) should be consistent throughout a document or display. Textual content should flow logically, with clear transitions and connections between sections.

Principle of Figure-Ground:

Learners must be able to distinguish the important information (figure) from the background (ground). Poor contrast between text and background, cluttered layouts, and overly complex backgrounds all impair figure-ground discrimination and make materials harder to read and understand.

Principle of Alignment:

Text and visual elements in a layout should be aligned consistently typically to a grid or axis to create order, predictability, and visual coherence. Misaligned or randomly placed elements create visual noise that distracts from the instructional message.

Principle of Proximity:

Related elements should be placed close together; unrelated elements should be separated. This principle helps learners perceive the relationships between different pieces of information and supports the organization of knowledge.

Principle of Learner Activity:

Effective instructional materials build in opportunities for learners to engage actively with the content through practice questions, self-assessment exercises, reflection prompts, and application activities. Active engagement promotes deeper processing and better retention.

Self-Assessment Exercise(s)

1. Explain four principles of message design in instructional materials

2. Examine a chart or poster available in your classroom or school. Evaluate it against the principles of clarity, emphasis, figure-ground, and alignment. What improvements would you recommend?

3. Discuss the importance of learner activity in enhancing instructional effectiveness

4.0 Conclusion

In this unit, you have explored the foundational principles of instructional design. You have seen that effective instructional materials are not created by chance but are the result of systematic planning grounded in theory and practice.

Understanding instructional design, learning theories, and message design principles provides you with the necessary framework to create materials that are not only visually appealing but pedagogically effective.

5.0 Summary

In this unit, you have learnt that instructional design is a systematic and evidence-based process aimed at achieving specific learning objectives. You have also examined how behaviourism emphasizes reinforcement and structured practice, cognitivism focuses on mental processing and organization, and constructivism promotes active, contextual learning.

Furthermore, you have explored essential message design principles such as clarity, emphasis, unity, figure-ground, alignment, proximity, and learner activity. It is important to note that all instructional decisions—whether related to text, visuals, or layout—must align with learner needs and objectives.

Finally, you have understood that instructional design is iterative, requiring continuous evaluation and refinement to ensure effectiveness.

6.0 Tutor-Marked Assignment (TMA)

1. Define instructional design and distinguish it from informal instructional practices
2. Compare behaviourism, cognitivism, and constructivism, highlighting one implication of each for instructional material design
3. Explain the concept of cognitive load and its relevance in instructional design
4. Design an instructional poster applying at least five message design principles and justify your design choices
5. Discuss why instructional design is considered an iterative process and the role of evaluation

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Unit 2

Basic Design Principles for Instructional Charts, Posters, and Displays

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3.2 Designing Effective Educational Posters

3.3 Effective Bulletin Board and Classroom Display Design

4.0 Conclusion

5.0 Summary

6.0 Tutor-Marked Assignment (TMA)

7.0 References/Further Reading

1.0 Introduction

In Unit 1, you were introduced to the foundational theories of instructional design, including learning theories and message design principles. At this point, it is important to move from

theory to practice. In this unit, we will apply those principles to the design of commonly used instructional materials—charts, posters, and classroom displays.

Let us consider the Nigerian classroom context, where access to advanced digital tools may be limited. Charts and posters remain some of the most practical and accessible instructional materials. They require minimal resources—often just card paper, markers, and creativity—yet their effectiveness depends largely on how well they are designed.

It is important to note that not all charts and posters are equally effective. A poorly designed chart can confuse learners, while a well-designed one can significantly enhance understanding and retention. This aligns with visual learning principles associated with Edgar Dale, who emphasized the importance of meaningful visual experiences in learning.

In this unit, you will learn practical, context-relevant guidelines for designing effective instructional charts, posters, and classroom displays.

2.0 Learning Outcomes

At the end of this unit, you should be able to:

- i. Apply visual design principles in creating effective instructional charts
- ii. Design educational posters using established communication design principles
- iii. Explain the principles of effective bulletin board and classroom display design
- iv. Analyse classroom visual materials for effectiveness based on design standards

3.0 Main Content

3.1 Designing Effective Instructional Charts

An instructional chart is a visual representation designed to communicate specific educational ideas, processes, or relationships. Unlike textbook pages, charts are purposefully designed to simplify and visually organize information for better understanding.

Types of Instructional Charts:

- Classification/Taxonomy charts: Show hierarchical relationships between categories (e.g., a chart of animal classification).
- Process/Flow charts: Show sequential steps in a process (e.g., the nitrogen cycle, the digestive process).
- Comparison charts: Present side-by-side comparisons of two or more items (e.g., types of soils, properties of metals).
- Timeline charts: Display events in chronological sequence (e.g., Nigerian political history).
- Statistical/Data charts: Present numerical data in visual form (bar charts, pie charts, line graphs).
- Concept maps: Show relationships between concepts using nodes and labeled arrows.

Design Guidelines for Effective Charts:

One Clear Message: Each chart should communicate one central idea. A chart that tries to convey too much information becomes cluttered and confusing. Ask: 'What is the single most important thing a learner should understand from this chart?'

Appropriate Scale and Visibility: Charts should be large enough for all learners to read clearly from any position in the classroom. As a general guide, text on a classroom chart should be no

smaller than 3 cm in height, and key diagrams should be clearly visible from a distance of 5–8 meters.

Limited Color Use: Use color purposefully and sparingly. Two to three colors are generally sufficient; more than four colors typically create visual noise. Use color consistently for example, always using the same color for a particular category throughout a chart.

Clean, Legible Lettering: Use clear, consistent lettering. Block capitals are generally more legible than cursive script for chart headings. Body text should use a clear, consistent style. Avoid mixing multiple lettering styles on the same chart.

Logical Layout: Organize content in a logical reading direction (top to bottom, left to right in English). Use alignment, proximity, and white space to group related elements and separate distinct sections.

Appropriate Use of Images: Illustrations, diagrams, and symbols on charts should be simple, clear, and directly relevant to the content. Overly detailed or decorative illustrations distract from the instructional message.

Self-Assessment Exercise(s)

- | |
|---|
| 1. Identify and explain six types of instructional charts and their educational purposes |
| 2. Discuss four design principles that enhance the effectiveness of instructional charts |
| 3. Design a classification chart for the plant kingdom, applying the principles discussed |

3.2 Designing Effective Educational Posters

An educational poster is designed to communicate a single, powerful message quickly and memorably. Unlike charts, posters rely heavily on visual impact and minimal text.

Let us consider what makes a poster effective. The first principle is simplicity of message. A poster should focus on one key idea. When multiple ideas are presented, the message becomes diluted.

Core Principles of Effective Poster Design:

Single, Powerful Message: An effective poster communicates one clear, memorable message. Identify the single most important idea you want the viewer to take away and design the entire poster around that idea.

Visual Dominance: The visual element (illustration, photograph, symbol, or bold graphic) should be the most prominent element on the poster. The visual should immediately communicate the essence of the message even before the text is read.

Minimal Text: Effective posters use as little text as possible. A catchy headline, a brief supporting statement, and a call to action (if appropriate) are usually sufficient. Long paragraphs of text defeat the purpose of a poster.

High Contrast and Visibility: Posters must be readable from a distance. Use high contrast between text and background (dark text on light background, or light text on dark background).

Avoid patterned or textured backgrounds that reduce text readability.

Cultural Relevance: Poster imagery should reflect the learners' cultural context. Images of people, environments, and cultural practices that learners recognize and relate to make the poster

more engaging and credible. This is a critical consideration in the Nigerian educational context, where imported materials often feature culturally unfamiliar images.

Attractive and Neat Presentation: Even hand-produced posters should be as neat and attractive as possible. Use ruled lines to guide lettering; use geometric shapes to create visual structure; choose colors that harmonize aesthetically.

The PARC Design Principles (applied to posters):

- Proximity: Group related elements together.
- Alignment: Align all elements to a consistent visual axis.
- Repetition: Repeat visual elements (colors, shapes, fonts) for consistency.
- Contrast: Use contrast in size, color, and weight to create emphasis and hierarchy.

Self-Assessment Exercise(s)

1. Differentiate between an instructional chart and an educational poster
2. Explain the PARC principles and their application in poster design
3. Design a road safety poster suitable for a secondary school environment

3.3 Effective Bulletin Board and Classroom Display Design

A well-designed classroom display environment including the arrangement of the bulletin board, wall displays, and other visual elements supports learning throughout the school day, not just during formal lesson time. Learners absorb information incidentally when they are surrounded

by relevant, well-organized, and regularly updated visual displays. This section provides guidelines for creating and maintaining effective classroom displays.

Purposes of Classroom Displays:

- Reference displays: Providing ongoing reference information such as multiplication tables, grammar rules, or scientific constants.
- Stimulus displays: Presenting thought-provoking images, questions, or problems that invite learner engagement.
- Learner work displays: Showcasing learner work to build pride, motivation, and a sense of community.
- Current events displays: Keeping learners informed about current events relevant to the curriculum.
- Aesthetic displays: Creating a visually pleasing, welcoming learning environment.

Guidelines for Effective Bulletin Board Design:

One Focus Per Board: Each bulletin board display should have a single clear focus or theme. A cluttered board with multiple unrelated elements achieves no display purpose effectively.

Change Displays Regularly: Displays that remain unchanged for months become invisible learners stop noticing them. Aim to update displays at least once per term, ideally more frequently for stimulus and current events displays.

Include Learner Work: Displays that feature learner work (selected thoughtfully and with learner consent) have particularly high motivational value. All learners should have their work displayed at some point during the school year.

Ensure Visibility and Legibility: Displays should be mounted at learner eye level and arranged so that all text and images are clearly visible. Consider the viewing angle and distance from which learners will normally observe the display.

Use a Clear Visual Hierarchy: The most important information on a display should be the most visually prominent, whether through size, color, or central placement.

Protect Displays from Damage: In humid Nigerian climates, lamination or transparent plastic covering helps protect displays from moisture, insects, and physical damage, extending their useful life considerably.

Self-Assessment Exercise(s)

1. List five purposes of classroom display. Give a specific example of a display that serves each purpose.

2. Why is it important to change classroom displays regularly? How often do you think displays should be changed, and why?

3. Design a theme-based bulletin board display for a secondary school English language class. Specify the theme, the visual elements, the text elements, and the student work to be included.

4.0 Conclusion

In this unit, you have explored the practical application of instructional design principles in creating charts, posters, and classroom displays. It is important to note that even simple, low-cost materials can significantly enhance learning when designed effectively.

As an educational technologist, your ability to design clear, engaging, and contextually relevant visual materials is a critical skill. These skills will become increasingly important as you continue to develop instructional resources for diverse learning environments.

5.0 Summary

In this unit, you have learnt that instructional charts should communicate a single clear message, use appropriate size, maintain legibility, and present information logically. You have also learnt that educational posters rely on visual dominance, minimal text, and cultural relevance to communicate effectively.

Furthermore, the PARC principles provide a structured approach to visual design, while classroom displays serve multiple instructional and motivational purposes. Effective bulletin boards require focus, regular updates, learner involvement, and durability.

6.0 Tutor-Marked Assignment (TMA)

- i. Explain the key principles for designing effective instructional charts and apply them to a chosen topic
- ii. Compare instructional charts and educational posters with practical examples
- iii. Critically analyse a classroom display using the PARC principles and suggest improvements
- iv. Develop a detailed bulletin board plan for a term in a secondary school subject

- v. Discuss the importance of cultural relevance in poster design within the Nigerian educational context Why is cultural relevance particularly important in the design of

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Unit 3

Designing for Learner Diversity and Inclusion

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3.0 Learning Contents

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3.3 Culturally Responsive Design and Accessibility for Learners with Disabilities

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6.0 Tutor-Marked Assignment (TMA)

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1.0 Introduction

In the previous units, you explored both the theoretical foundations of instructional design and the practical principles guiding the design of charts, posters, and other visual materials. At this point, it is important to extend that knowledge into a critical area of contemporary educational practice—designing for learner diversity and inclusion.

Let us consider a typical Nigerian classroom. Such a classroom often includes learners from diverse ethnic, linguistic, and religious backgrounds. In addition, learners differ in their prior knowledge, learning pace, cognitive abilities, and physical or sensory conditions. When instructional materials are designed for an assumed “average learner,” a significant number of students are unintentionally excluded.

Designing for diversity and inclusion therefore requires intentional effort. It involves creating instructional materials that are flexible, accessible, and culturally relevant.

2.0 Learning Outcomes

At the end of studying this unit, you should be able to:

- i. Define learner diversity and explain its implications for instructional material design.
- ii. Describe the principles of Universal Design for Learning (UDL) and apply them to instructional design.
- iii. Analyse strategies for making instructional materials culturally responsive and accessible to learners with disabilities.

3.0 Main Content

3.1 Learner Diversity and Its Implications for Instructional Design

Learner diversity refers to the wide range of differences among learners that influence how they learn and how they interact with instructional materials. Understanding these differences is fundamental to effective instructional design.

Dimensions of Learner Diversity:

- Cognitive diversity: Differences in intellectual ability, learning speed, working memory capacity, and problem-solving approaches.
- Language diversity: Differences in first language, level of proficiency in the language of instruction (English), and literacy level.
- Cultural and ethnic diversity: Differences in cultural background, worldview, prior knowledge, and cultural learning preferences.
- Socioeconomic diversity: Differences in access to learning materials, nutritional status, and home learning support.
- Learning style diversity: Differences in preferred modalities (visual, auditory, kinesthetic) and cognitive styles.
- Disability: Physical, sensory (visual, hearing), intellectual, and communication disabilities that require specific accommodations.

In Nigeria's diverse educational landscape, language diversity is particularly significant. Many learners are being taught in English their second, third, or even fourth language while their home language is Hausa, Yoruba, Igbo, or one of Nigeria's other languages. Instructional materials that rely exclusively on dense written English text without visual support may effectively exclude a significant proportion of learners from full engagement with the content.

The implications of learner diversity for instructional material design include: providing multiple representations of key concepts (text, visual, audio); using language that is accessible to learners at the expected proficiency level; incorporating culturally familiar examples, images, and contexts; designing for different levels of prior knowledge; and incorporating features that support learners with disabilities.

Self-Assessment Exercise(s)

- | |
|--|
| 1. Define learner diversity and identify six dimensions that influence learning. |
| 2. Explain why linguistic diversity presents a major challenge in Nigerian classrooms. |
| 3. Suggest three strategies for designing instructional charts that accommodate learners with different levels of English proficiency. |

3.2 Universal Design for Learning (UDL)

Universal Design for Learning (UDL) is a research-based framework that guides the development of flexible instructional materials capable of accommodating diverse learners. The concept is adapted from architectural design, where environments are created to be accessible to all users from the outset, rather than modified later.

UDL is built around three core principles.

Principle 1: Multiple Means of Representation (the 'What' of Learning):

Learners differ in how they best perceive and comprehend information. UDL requires that information be presented through multiple channels and in multiple formats. For instructional material design, this means: presenting key concepts through both text and visual images; using diagrams and charts to support verbal explanations; providing glossaries or vocabulary support for unfamiliar terms; using audio descriptions or read-aloud features where possible; and providing worked examples that show concept application.

Principle 2: Multiple Means of Action and Expression (the 'How' of Learning):

Learners differ in how they best demonstrate what they know and can do. Assessment and practice activities in instructional materials should allow learners to express their understanding through multiple means writing, drawing, speaking, demonstrating, or constructing. This principle challenges the narrow reliance on written tests as the only valid form of assessment.

Principle 3: Multiple Means of Engagement (the 'Why' of Learning):

Learners differ in what motivates and engages them. Instructional materials should offer choices in topics, content, difficulty level, and type of activity where possible; connect learning to learners' interests and real-life contexts; build in opportunities for collaboration and discussion; and celebrate learner effort and progress.

While the full implementation of UDL may be challenging in large, under-resourced Nigerian classrooms, even partial application of UDL principles such as consistently pairing text with visual representations, or incorporating both individual and collaborative practice activities can significantly improve the accessibility and effectiveness of instructional materials.

Self-Assessment Exercise(s)

1. Define Universal Design for Learning and outline its three core principles.
2. Explain how multiple means of representation can be applied when designing a chart on the water cycle.
3. Identify challenges of implementing UDL in Nigerian schools and propose two practical solutions.

3.3 Culturally Responsive Design and Accessibility for Learners with Disabilities

Another important dimension of inclusive instructional design is cultural responsiveness. Culturally responsive materials reflect and respect the cultural backgrounds of learners. They incorporate familiar names, contexts, and experiences, thereby making learning more meaningful and relatable.

Culturally Responsive Design:

Culturally responsive instructional materials are materials that reflect, validate, and build on the cultural knowledge, experiences, and values of the learners they serve. They use examples, images, contexts, names, and situations that are familiar and relevant to the target learner population.

In practice, culturally responsive design in Nigeria means: using Nigerian names and contexts in examples and word problems; featuring images of Nigerian people, environments, foods, and cultural practices; drawing on indigenous knowledge and local examples to illustrate scientific, mathematical, and social concepts; using local linguistic structures and idioms where

appropriate; and avoiding stereotypes or deficit representations of any ethnic, regional, or religious group.

Culturally responsive materials do not reject or exclude global knowledge and perspectives they anchor global content in local experience, making it more accessible and meaningful for Nigerian learners.

Designing for Learners with Visual Impairments:

For learners with low vision (partial sight), materials should use high contrast, larger text, and clear, uncluttered layouts. For learners who are blind, tactile materials such as raised-line diagrams, Braille text, and three-dimensional models are essential.

Designing for Learners with Hearing Impairments:

For learners who are deaf or hard of hearing, visual representations of content are particularly important. Text-based alternatives to audio content, visual cues and signals, and the use of sign language interpreters (where available) support these learners' access to instruction.

Designing for Learners with Intellectual Disabilities:

For learners with intellectual disabilities, materials should use simple, concrete language; short sentences; clear visual support; and step-by-step instructions. Tasks should be broken into small, manageable components with frequent checkpoints for understanding.

While many Nigerian schools lack the specialized resources needed to fully serve learners with disabilities, the attitude of the teacher and the flexibility of the instructional materials can make a significant difference to these learners' educational experience.

- Use Nigerian names, contexts, and examples in instructional materials.
- Include images of diverse Nigerian people and environments.
- Use high-contrast text and images for visual accessibility.
- Provide both visual and text-based representations of key concepts.
- Break complex tasks into small, clearly sequenced steps.
- Design activities that allow multiple modes of expression and participation.

Self-Assessment Exercise(s)

1. Define culturally responsive instructional design and explain its relevance in Nigeria.
2. Suggest three ways to make a mathematics worksheet culturally responsive.
3. What design accommodations can a teacher incorporate into printed instructional materials to support learners with visual impairments?
4. Outline how you would design a culturally responsive instructional chart on nutrition for primary school learners.

4.0 Conclusion

This unit has highlighted the importance of designing instructional materials that recognize and accommodate learner diversity. You have seen that diversity is multidimensional, encompassing cognitive, linguistic, cultural, socioeconomic, and disability-related differences.

You were also introduced to the Universal Design for Learning framework, which provides a structured approach to inclusive design through representation, expression, and engagement. In addition, culturally responsive design and accessibility considerations were examined as essential components of effective instructional practice.

These principles are not optional additions; they are central to meaningful and equitable education.

5.0 Summary

In this unit, you have learnt that:

Learner diversity includes cognitive, linguistic, cultural, socioeconomic, and disability-related differences that influence learning. You have also learnt that Universal Design for Learning provides three key principles—multiple means of representation, action and expression, and engagement—which guide inclusive instructional design. Furthermore, culturally responsive design ensures that instructional materials reflect learners’ cultural contexts, while accessibility considerations support learners with disabilities. Even modest application of these principles can significantly enhance learning outcomes in diverse classrooms.

6.0 Tutor-Marked Assignment (TMA)

1. Define learner diversity and discuss its implications for instructional material design.
2. Explain the three principles of Universal Design for Learning and demonstrate how each can be applied in designing a biology handout.

3. Discuss culturally responsive instructional design and provide five examples relevant to Nigerian learners.
4. Design an inclusive instructional chart on the human digestive system that accommodates learners with partial sight.
5. Explain how instructional assessments can incorporate multiple means of expression.

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Module 6

The ASSURE Model and Other Instructional Design Models

Unit 1:	The ASSURE Model: A Framework for Resource-Based Instruction
Unit 2:	Applying the ASSURE Model: Steps A, S, and S
Unit 3:	Applying the ASSURE Model: Steps U, R, and E; and Other Instructional Design Models

Unit 1

The ASSURE Model: A Framework for Resource-Based Instruction

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4.0 Conclusion

5.0 Summary

6.0 Tutor-Marked Assignment (TMA)

7.0 References/Further Reading

1.0 Introduction

Welcome to Module 6. At this stage of your learning journey, you have already developed a solid understanding of instructional resources—how to identify, classify, and design them effectively.

Let us now move a step further by introducing a systematic framework that brings all these elements together into a coherent instructional plan: the ASSURE model.

The ASSURE model, developed by Sharon Smaldino, Robert Heinich, Michael Molenda, and James Russell, is widely recognized in the field of instructional design. It provides a practical and structured approach for integrating instructional media and technologies into teaching and learning processes.

It is important to note that the model aligns closely with the principles of resource-based instruction, placing emphasis on the careful selection, utilization, and evaluation of instructional materials. This makes it particularly relevant to the knowledge and skills you have developed in previous modules.

In this unit, you will explore the structure of the ASSURE model, its theoretical foundations, and its relevance within the Nigerian educational context.

2.0 Learning Outcomes

At the end of studying this unit, you should be able to:

- i. Describe the ASSURE model as a framework for instructional planning
- ii. Explain the theoretical foundations and key assumptions of the ASSURE model
- iii. Analyse the relevance and applicability of the ASSURE model in the Nigerian educational context

3.0 Main Content

3.1 Overview of the ASSURE Model

Let us consider the ASSURE model as a structured guide that supports teachers in planning effective, resource-based instruction. The term “ASSURE” is an acronym representing six sequential steps in instructional planning.

At this point, it is important to understand each step clearly:

- A; Analyze Learners: Understand the characteristics of the target learner population before designing instruction.
- S; State Objectives: Clearly state the specific learning outcomes that instruction is intended to achieve.
- S; Select Methods, Media, and Materials: Choose the instructional methods, media formats, and specific materials that are most appropriate for the learners and objectives.
- U; Utilize Media and Materials: Plan how the selected materials will be used in the actual instructional event.
- R; Require Learner Participation: Design the lesson to actively involve learners rather than keeping them as passive observers.
- E; Evaluate and Revise: Assess the effectiveness of the instruction and the instructional materials, and revise based on the evidence gathered.

The ASSURE model is procedural it prescribes a specific sequence of steps that the instructional designer or teacher should follow when planning a lesson or instructional unit. However, the model is also iterative: evaluation findings from Step E feed back into all earlier steps, leading to continuous improvement of instructional plans and materials.

The ASSURE model is specifically designed for use by classroom teachers, not only by professional instructional designers. Its steps are practical and actionable within the constraints of a real school environment, making it well-suited to use by educational technologists and student teachers in Nigeria.

The model is grounded in a tradition of systematic instructional design that can be traced to Robert Gagné's conditions of learning, which describes the internal and external conditions

necessary for effective learning of different types of content. The ASSURE model operationalizes these conditions in a practical, classroom-friendly format.

Self-Assessment Exercise(s)

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|---|
| 1. What does the acronym ASSURE represent, and how does each step contribute to instructional planning? |
| 2. Why is the ASSURE model particularly appropriate for use by classroom teachers as opposed to professional instructional designers? |
| 3. How does the ASSURE model reflect the principle of learner-centered instruction? |

3.2 Theoretical Foundations of the ASSURE Model

At this stage, let us examine the theoretical foundations that underpin the ASSURE model. Understanding these foundations will deepen your appreciation of why the model is structured the way it is.

Foundation 1: Robert Gagné's Conditions of Learning:

Robert Gagné identified nine 'instructional events' a sequence of instructional actions that support effective learning when properly organized. These include: gaining learner attention; informing learners of the objective; stimulating recall of prior learning; presenting new content; providing learning guidance; eliciting performance; providing feedback; assessing performance; and enhancing retention and transfer. The ASSURE model's structure reflects Gagné's

framework, particularly in its emphasis on stating objectives, requiring learner participation, and evaluating outcomes.

Foundation 2: Communication Theory:

The ASSURE model draws on communication theory, particularly the source-message-channel-receiver (SMCR) model developed by David Berlo. This model emphasizes that effective communication requires not only a clear message but also an appropriate channel that matches the characteristics of the receiver. The 'Select Methods, Media, and Materials' step of ASSURE reflects this principle by requiring careful matching of media to learner characteristics.

Foundation 3: Systems Theory:

The ASSURE model is based on a systems view of instruction the idea that effective teaching and learning result from the coherent alignment of all components of the instructional system: learner characteristics, learning objectives, instructional methods, instructional media, learner participation, and evaluation. When all components are aligned and working together, the instructional system is effective; when any component is missing or misaligned, effectiveness is compromised.

Foundation 4: Behavioural and Cognitive Learning Theory:

The emphasis in the ASSURE model on stating measurable behavioural objectives (S; State Objectives) reflects behaviourist principles. The emphasis on activating prior learning, providing guidance, and requiring active participation reflects cognitivist principles. The model thus draws eclectically on multiple theoretical traditions.

Self-Assessment Exercise(s)

1. Describe Gagné's nine instructional events and explain how they relate to the ASSURE model.

2. How does Berlo's SMCR communication model inform the 'Select Methods, Media, and Materials' step of ASSURE?

3. Explain how the ASSURE model reflects a systems approach to instruction.

3.3 Relevance of the ASSURE Model in the Nigerian Educational Context

Let us now consider how the ASSURE model applies within the Nigerian educational environment.

Relevance to Resource-Limited Settings:

The ASSURE model explicitly requires teachers to analyze learner characteristics and available resources before selecting materials. This means that a teacher using ASSURE does not automatically reach for the most expensive or technologically sophisticated resource they select the resource that is most appropriate for the learners, objectives, and context. In a resource-limited Nigerian school, this might mean choosing a locally produced chart over a commercial video, or a community field visit over a computer simulation.

Relevance to Multi-Cultural Classrooms:

The 'Analyze Learners' step of ASSURE explicitly requires attention to learner diversity including linguistic background, prior knowledge, and learning preferences. This emphasis is particularly valuable in Nigeria's linguistically and culturally diverse educational environment.

Relevance to the Practical Component of EDT 301:

The ASSURE model provides a natural framework for the mini-project requirement of this course (to be developed in Module 9). A complete EDT 301 mini-project will require you to: analyze a specific learner population; state measurable learning objectives; select appropriate methods, media, and materials (including locally produced resources); plan for learner participation; and include an evaluation component.

Limitations of the ASSURE Model in Nigerian Contexts:

The model was originally developed with the assumption of access to a range of commercial media and technologies. Its 'Select Methods, Media, and Materials' step may need to be adapted for contexts where commercial media are unavailable, and where improvised, community-sourced, or OER materials are the primary resource. This course, and EDT 301 specifically, is designed to equip you with the skills to make exactly this adaptation.

- ASSURE's learner analysis step is valuable for addressing Nigeria's linguistic and cultural diversity.
- The resource selection step encourages context-appropriate, locally grounded choices.
- ASSURE provides the planning framework for the EDT 301 mini-project.
- The model should be adapted to prioritize locally available and improvised resources in resource-limited settings.

Self-Assessment Exercise(s)

1. Explain how the ASSURE model can be adapted for use in a Nigerian secondary school with limited access to commercial instructional media.

2. What specific features of the ASSURE model make it relevant to Nigeria's diverse educational environment?

3. How does the ASSURE model connect to the EDT 301 mini-project requirement?

4.0 Conclusion

In this unit, you have been introduced to the ASSURE model as a comprehensive framework for planning resource-based instruction. You have explored its structure, examined its theoretical foundations, and considered its relevance within the Nigerian educational context.

It is important to note that the ASSURE model is both practical and adaptable, making it a valuable tool for teachers and instructional designers alike. As you progress to subsequent units, you will examine each step of the model in greater detail.

5.0 Summary

In this unit, you have learnt that:

In this unit, you have learnt that the ASSURE model is a systematic framework consisting of six stages: analyzing learners, stating objectives, selecting methods/media/materials, utilizing resources, requiring learner participation, and evaluating and revising instruction.

You have also seen that the model is grounded in established theories, including Gagné's conditions of learning, communication theory, systems theory, and behavioural and cognitive learning theories.

Furthermore, the ASSURE model is particularly relevant in the Nigerian educational context due to its emphasis on learner analysis, context-appropriate resource selection, and adaptability to resource-constrained environments.

6.0 Tutor-Marked Assignment (TMA)

1. Explain the ASSURE model, describing each of its six steps.
2. Describe two theoretical foundations of the ASSURE model and explain how each is reflected in its structure.
3. Analyse the relevance of the ASSURE model in Nigerian secondary school education.
4. How would you adapt the ASSURE model for a school without electricity or access to commercial instructional materials?
5. Discuss how the ASSURE model supports the integration of community resources into classroom instruction.

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Unit 2

Applying the ASSURE Model: Steps A, S, and S

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3.2 Step S: State Objectives

3.3 Step S: Select Methods, Media, and Materials

4.0 Conclusion

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6.0 Tutor-Marked Assignment (TMA)

7.0 References/Further Reading

1.0 Introduction

In Unit 1, you were introduced to the ASSURE Model, its theoretical foundations, and its relevance to educational practice within Nigeria. Building on that foundation, this unit takes a deeper and more practical approach by focusing on the first three steps of the model: **Analyze Learners (A), State Objectives (S), and Select Methods, Media, and Materials (S).**

At this point, it is important to recognise that these steps form the **planning phase** of instruction. Let us consider what this means. Before any teaching begins, an effective instructional designer must carefully think through who the learners are, what they are expected to achieve, and how best to support that learning. This phase is not merely preparatory—it determines the success or failure of the entire instructional process.

A lesson that is grounded in a thorough understanding of learners, guided by clearly defined objectives, and supported by appropriate methods and materials is far more likely to produce meaningful learning outcomes. In this unit, you will explore these steps in detail, with practical illustrations drawn from the Nigerian educational context.

2.0 Learning Outcomes

At the end of studying this unit, you should be able to:

- i. Conduct a learner analysis using the ASSURE framework
- ii. Write measurable instructional objectives using the ABCD format
- iii. Apply Bloom’s Taxonomy to develop multi-level learning objectives
- iv. Select appropriate instructional methods, media, and materials using systematic criteria

3.0 Main Content

3.1 Step A: Analyze Learners

The first step of the ASSURE model Analyze Learners establishes the foundation for all subsequent planning decisions. It requires the teacher or instructional designer to gather and

reflect on specific information about the target learner population before making any decisions about objectives, methods, or materials.

What to Analyze:

The ASSURE model identifies three main categories of learner characteristics to be analyzed:

General Characteristics: These include age, grade level, educational background, prior academic experience, socioeconomic status, cultural and ethnic background, and geographic location. For example, a secondary school class in a rural Kogi State community will have different general characteristics from an urban Lagos class, and these differences should influence resource selection.

Specific Entry Competencies: These are the specific knowledge, skills, and attitudes that learners already possess in relation to the content of the planned lesson. What do learners already know about the topic? What misconceptions might they hold? What prerequisite skills do they possess? Answering these questions helps the teacher pitch instruction at the right level not too easy (boring) and not too difficult (frustrating).

Learning Styles: As discussed in Module 5, learners differ in their preferred modalities (visual, auditory, kinesthetic), cognitive styles (global vs. analytical), and motivational orientations. Gathering information about learning style preferences helps the teacher design instruction that engages a wider range of learners.

How to Gather Learner Information:

- Review academic records and previous assessment results.
- Administer diagnostic pre-tests to assess entry competencies.

- Observe learners during classroom activities.
- Conduct informal discussions with learners and their previous teachers.
- Consult with parents and community members about learners' background and interests.

The information gathered in the learner analysis should be documented in a brief Learner Profile that will guide all subsequent planning decisions.

Self-Assessment Exercise(s)

- | |
|--|
| 1. Identify and explain the three categories of learner characteristics in the ASSURE model. |
| 2. How can learner analysis influence instructional resource selection in a secondary school classroom? |
| 3. Design five diagnostic questions to assess learners' prior knowledge of the human respiratory system. |

3.2 Step S: State Objectives

The second step of the ASSURE model State Objectives requires the teacher to translate the general educational goals of the lesson into specific, measurable learning outcomes. This step is critical because objectives serve multiple functions: they guide the selection of instructional methods and materials; they define the standards against which learning will be assessed; they communicate to learners what they are expected to achieve; and they provide a basis for evaluating the effectiveness of instruction.

Characteristics of Well-Written Objectives:

Well-written instructional objectives are typically described using the 'ABCD' format:

- A: Audience: Who is doing the learning? (e.g., 'The student will...')
- B: Behavior: What observable, measurable action will the learner perform? (Use action verbs such as 'identify,' 'describe,' 'calculate,' 'construct,' 'demonstrate,' not vague verbs like 'understand' or 'appreciate')
- C: Condition: Under what conditions will the behavior be performed? (e.g., 'given a diagram of the human heart,' 'using the provided ruler and protractor')
- D: Degree: To what standard of performance? (e.g., 'with at least 80% accuracy,' 'naming all four chambers correctly,' 'within 10 minutes')

Bloom's Taxonomy as a Guide for Objective Writing:

Bloom's Taxonomy provides a hierarchical classification of cognitive learning outcomes that is widely used as a guide for writing instructional objectives. The taxonomy identifies six levels of cognitive complexity:

- 1. Remember: Recall facts and basic concepts (define, list, identify, name).
- 2. Understand: Explain ideas or concepts (describe, explain, summarize, classify).
- 3. Apply: Use information in new situations (use, demonstrate, calculate, solve).
- 4. Analyze: Draw connections among ideas (compare, contrast, distinguish, examine).
- 5. Evaluate: Justify a decision or course of action (assess, critique, evaluate, judge).
- 6. Create: Produce new or original work (design, construct, develop, compose).

Effective lesson planning typically includes objectives at multiple levels of Bloom's Taxonomy, ensuring that instruction develops not only basic knowledge recall but also higher-order thinking skills.

Examples of Well-Written Objectives:

Poor: 'Learners will understand the water cycle.' (Not measurable; 'understand' is vague.)

Better: 'Given a blank diagram of the water cycle, learners will correctly label all five stages (evaporation, condensation, precipitation, runoff, and infiltration) without reference to notes.'
(Audience, behavior, condition, and degree are all specified.)

Self-Assessment Exercise(s)

- | |
|---|
| 1. Explain the ABCD format for writing instructional objectives, giving an example for each component. |
| 2. Using Bloom's Taxonomy, write three instructional objectives for a lesson on Nigerian independence history one at the Remember level, one at the Apply level, and one at the Create level. |
| 3. Evaluate the following objective and rewrite it to meet the ABCD criteria: 'Students will know about photosynthesis.' |

3.3 Step S: Select Methods, Media, and Materials

The third step of the ASSURE model focuses on making informed decisions about **how instruction will be delivered** and **what resources will be used**.

This step involves three closely related decisions.

Selecting Instructional Methods:

Instructional methods are the broad approaches used to organize and deliver instruction. They include: direct instruction (teacher-centered explanation and demonstration); inquiry-based learning (learner investigation and discovery); cooperative learning (structured group activities); problem-based learning (authentic problem-solving); discussion; simulation; field experience; and peer tutoring. The choice of method should be informed by the learner analysis (Step A) and the nature of the stated objectives (Step S).

Selecting Media Formats:

Media selection involves choosing the type or category of resource (text, visual display, audio, video, real object, model, digital) that is most appropriate for the learning objective and learner characteristics. Key criteria for media selection include:

- Match to objective: Does this media type effectively support the intended learning outcome?
- Match to learner: Is this media type appropriate for the learners' age, language, and experience?
- Practical feasibility: Is this media type available, affordable, and usable in the given setting?
- Engagement potential: Is this media type likely to stimulate learner interest and active participation?

Selecting or Producing Specific Materials:

Having selected the media format, the teacher must identify or produce the specific materials to be used. The ASSURE model recommends a three-part process: first, identify existing suitable materials (commercially produced, OER, or materials from the school's resource inventory); second, modify existing materials if they are close but not perfectly suited to the need; and third, design and produce new materials when no suitable existing materials can be found.

In the Nigerian context, where commercially produced materials are often unavailable or culturally inappropriate, the design and production of original materials including improvised instructional materials is a particularly important skill. This skill is the focus of Modules 7 and 8 of this course.

Self-Assessment Exercise(s)

1. What three decisions does the 'Select Methods, Media, and Materials' step of ASSURE require?

2. Using the media selection criteria described in this section, select and justify the most appropriate media format for teaching each of the following: (a) the concept of density, (b) the story of the trans-Atlantic slave trade, (c) the technique of traditional weaving.

3. Explain the three-part process for selecting or producing specific instructional materials in the ASSURE model. Why is the ability to produce original materials particularly important in Nigerian schools?

4.0 Conclusion

In this unit, you have explored the first three steps of the ASSURE model in depth. You have seen how analysing learners provides a foundation for instructional planning, how clearly stated objectives guide both teaching and assessment, and how thoughtful selection of methods and materials enhances learning effectiveness.

These steps collectively form the backbone of instructional design. As you move to the next unit, you will build on this foundation by examining how instruction is implemented, how learners participate, and how learning outcomes are evaluated.

5.0 Summary

In this unit, you have learnt that:

The Analyze Learners step involves examining general characteristics, entry competencies, and learning preferences. You have also learnt that instructional objectives should be structured using the ABCD format and guided by Bloom's Taxonomy to ensure measurable and meaningful outcomes.

Furthermore, you have understood that selecting methods, media, and materials requires systematic decision-making based on alignment with objectives, learner needs, feasibility, and engagement potential. Finally, you have seen that instructional materials may be identified, modified, or newly developed, especially in contexts where resources are limited.

6.0 Tutor-Marked Assignment (TMA)

1. What information should be included in a learner profile developed for the 'Analyze Learners' step of ASSURE?
2. Write three instructional objectives using the ABCD format for a secondary school lesson on malaria prevention.
3. Using Bloom's Taxonomy, write one objective at each of the six cognitive levels for a lesson on the structure and function of the human heart.
4. For a lesson on traditional Nigerian architecture, select the most appropriate media format and specific materials. Justify your choices using the criteria for media selection.
5. Apply Steps A, S, and S of the ASSURE model to plan a lesson on environmental conservation for a JSS 2 class in a rural Nigerian school.

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Unit 3

Applying the ASSURE Model: Steps U, R, and E; and Other Instructional Design Models

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5.0 Summary

6.0 Tutor-Marked Assignment (TMA)

7.0 References/Further Reading

1.0 Introduction

In Unit 2, you examined the first three planning stages of the ASSURE model. At this point, we move into the practical phase of instruction by focusing on the remaining steps: Utilize Media

and Materials, Require Learner Participation, and Evaluate and Revise. These steps are critical because they determine whether well-prepared instructional plans actually translate into meaningful learning experiences.

It is important to note that while earlier steps occur before teaching begins, these final stages take place during and after instruction. They therefore serve as the bridge between planning and real classroom practice.

In addition, this unit expands your understanding by introducing other major instructional design models such as the ADDIE model, Gagné’s instructional events, and the Dick and Carey systems approach. These models complement the ASSURE framework and provide broader perspectives for instructional design.

By the end of this unit, you will not only understand how to fully implement the ASSURE model but also be able to select appropriate instructional design frameworks for different educational contexts.

2.0 Learning Outcomes

At the end of studying this unit, you should be able to:

- i. apply the “Utilize Media and Materials” step of the ASSURE model in instructional planning
- ii. design learner participation activities aligned with instructional objectives
- iii. explain the “Evaluate and Revise” step within the ASSURE model
- iv. analyse and compare at least two other instructional design models

3.0 Main Content

3.1 Step U: Utilize Media and Materials

Let us consider the transition from planning to action. After selecting instructional methods and materials, the next task is to determine how these resources will be effectively used in a real teaching situation. This is the essence of the “Utilize Media and Materials” step.

To guide this process, the ASSURE model proposes a structured approach known as the **5 Ps**.

Preview the Materials:

Before the lesson, the teacher previews all materials to be used watching a video clip, reading a handout, examining a chart to verify that the content is appropriate, accurate, and relevant; that the material is free from technical faults; and that it is free from potentially offensive or inappropriate content. This step prevents unpleasant surprises during the lesson.

Prepare the Materials:

All materials should be assembled, organized, and ready for use before learners arrive. Equipment should be tested and confirmed to be in working order. Handouts should be counted and organized for distribution. Charts should be prepared for display. Specimens or real objects should be prepared and safely arranged. The goal is to minimize setup time during the lesson, which wastes instructional time and disrupts lesson flow.

Prepare the Environment:

The physical environment should be arranged to support the planned instructional activity. If a video is to be shown, learners' seating should be positioned to ensure clear visibility. If a group activity is planned, furniture should be rearranged to support group work. If a guest speaker is expected, a suitable speaking space should be prepared.

Prepare the Learners:

Before presenting the instructional material, the teacher should prepare learners for the experience. This involves: gaining their attention; activating their prior knowledge; informing them of the learning objective; and providing any specific instructions or tasks they should perform while engaging with the material (e.g., 'as you watch this video, listen for the three main causes of soil erosion and write them in your notebook').

Provide the Learning Experience:

Finally, the teacher delivers the instructional experience presenting the chart, showing the video, conducting the demonstration, or facilitating the field visit while actively managing the learning environment, monitoring learner engagement, and providing real-time clarification and guidance as needed.

Self-Assessment Exercise(s)

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|---|
| 1. Describe the '5 Ps' procedure for utilizing media and materials in the ASSURE model. |
| 2. Why is it important to prepare learners before presenting an instructional resource? Give a specific example. |
| 3. A teacher plans to show a documentary film about the Niger Delta oil spill in an environmental science class. Using the 5 Ps, plan the utilization of this resource. |

3.2 Step R: Require Learner Participation

The fifth step of the ASSURE model Require Learner Participation reflects a fundamental principle of effective learning: active engagement produces better outcomes than passive observation. Research consistently demonstrates that learners who are actively involved in processing, applying, and reflecting on new content learn more deeply and retain information more effectively than those who passively listen or watch.

The ASSURE model explicitly builds learner participation into the instructional plan, rather than leaving it to chance. This step requires the teacher to design specific activities that require learners to engage actively with the instructional content during the lesson.

Types of Learner Participation Activities:

- Guided practice: Learners practice applying a new skill or concept under close teacher supervision (e.g., solving worked examples after a mathematics demonstration).
- Independent practice: Learners apply what they have learned without teacher assistance (e.g., completing worksheet exercises after guided practice).
- Discussion and questioning: The teacher poses questions that require learners to think, analyze, and articulate their understanding.
- Cooperative/collaborative activities: Learners work together in pairs or small groups to complete a task, discuss a problem, or create a product.
- Self-assessment: Learners reflect on their own understanding and identify areas of difficulty using provided checklists or self-test questions.
- Application projects: Learners apply their learning to a real-world context through a project, investigation, or problem-solving activity.

The participation activities built into a lesson should be directly aligned with the stated learning objectives. If the objective requires learners to 'calculate,' the participation activity should require calculation. If the objective requires learners to 'design,' the participation activity should involve design. This alignment between objective and activity is a fundamental principle of instructional coherence.

In the context of EDT 301, learner participation can also involve learners in the production, evaluation, and utilization of instructional resources themselves a highly effective form of engagement that develops both content knowledge and practical skills simultaneously.

Self-Assessment Exercise(s)

1. Why does the ASSURE model explicitly require learner participation rather than leaving it to emerge naturally?

2. Design three different learner participation activities for a lesson on traditional Nigerian textile production one guided practice, one cooperative activity, and one self-assessment activity.

3. How should learner participation activities be aligned with instructional objectives? Give an example.

3.3 Step E: Evaluate and Revise; Other Instructional Design Models

The final step of the ASSURE model focuses on continuous improvement. Evaluation involves collecting evidence to determine whether instructional goals have been achieved and whether the teaching methods were effective.

What to Evaluate:

The ASSURE model identifies two main targets of evaluation: learner achievement (Did learners achieve the stated objectives? Assessment of learning outcomes through tests, observations, and performance tasks provides evidence of learner achievement.) and instructional quality (Were the methods, media, and materials effective? Was the lesson well-organized and engaging? Were there any technical or logistical problems? These questions can be answered through learner feedback questionnaires, peer observation, and teacher self-reflection.)

How to Revise:

Based on evaluation evidence, the teacher identifies specific aspects of the lesson or materials that need improvement and makes targeted revisions. Common revisions include: re-sequencing content that learners found confusing; replacing materials that were culturally irrelevant or technically poor; adding more practice activities for objectives where achievement was low; and adjusting the pacing of the lesson based on feedback.

Other Instructional Design Models:

While ASSURE is the primary model for this course, it is important to be familiar with other instructional design models that complement or extend ASSURE in various ways.

The ADDIE Model: ADDIE Analysis, Design, Development, Implementation, Evaluation is the most widely used generic instructional design framework. Like ASSURE, it is systematic and

iterative; unlike ASSURE, it is designed for comprehensive instructional design projects rather than single lesson planning. ADDIE is typically used for the design of courses, programs, and large-scale instructional systems rather than individual lessons.

Gagné's Nine Events of Instruction: Gagné identified nine instructional events that, when incorporated into a lesson, reliably support effective learning: gain attention; inform learner of objectives; stimulate recall of prior knowledge; present new content; provide learning guidance; elicit performance; provide feedback; assess performance; enhance retention and transfer. These nine events are entirely compatible with the ASSURE model and can be used as a checklist within the 'Utilize' and 'Require Participation' steps.

Dick and Carey Systems Approach: The Dick and Carey model is a comprehensive systems approach that breaks instructional design into ten sequential steps, from identifying instructional goals to revising instruction based on summative evaluation. It is more detailed and complex than ASSURE or ADDIE, and is particularly suited to the design of large-scale instructional programs.

Choosing the Right Model:

- For single lesson planning: ASSURE is most appropriate.
- For course or program design: ADDIE or Dick and Carey are more appropriate.
- For systematic event-level design within a lesson: Gagné's Nine Events provide useful guidance.
- All models are iterative evaluation and revision are essential components of each.

Self-Assessment Exercise(s)

1. What are the two main targets of evaluation in the 'Evaluate and Revise' step of ASSURE?

2. After using a hand-drawn chart to teach a lesson, a teacher receives feedback that the chart was too small for learners at the back of the room to read clearly. What specific revision should the teacher make?

3. Compare the ASSURE model with the ADDIE model. For what type of instructional design project would each be most appropriate?

4. Describe Gagné's nine events of instruction and explain how they can be incorporated into a lesson planned using the ASSURE model.

4.0 Conclusion

In this unit, you have explored the final stages of the ASSURE model, focusing on implementation and improvement. These steps—Utilize, Require Participation, and Evaluate—ensure that instructional planning leads to meaningful learning outcomes.

You have also been introduced to other instructional design models that expand your capacity to design instruction across different contexts. With this knowledge, you are now better equipped to design effective, learner-centred instruction.

5.0 Summary

In this unit, you have learnt that the “Utilize Media and Materials” step follows the structured 5 Ps approach, ensuring effective use of instructional resources. You have also seen that learner

participation is essential for meaningful learning and must be deliberately planned and aligned with instructional objectives.

Furthermore, you have understood that evaluation and revision are continuous processes that improve instructional quality over time. Finally, you have explored other instructional design models such as ADDIE, Gagné’s Nine Events, and the Dick and Carey model, each suited to different instructional contexts.

6.0 Tutor-Marked Assignment (TMA)

1. Describe the “5 Ps” procedure and apply it to a lesson involving a specific instructional material.
2. Design a learner participation plan for a lesson on water conservation, including at least three different activities.
3. Explain how evaluation and revision improve instructional effectiveness over time.
4. Compare the ASSURE model with ADDIE and Gagné’s Nine Events in terms of purpose and application.
5. Apply all six steps of the ASSURE model to design a lesson on community health for Senior Secondary School 1 students in a rural Nigerian context.

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Module 7

Production of Improvised Instructional Materials

Unit 1:	Improvisation in Education: Concept, Rationale, and Principles
Unit 2:	Production of Improvised Visual and Graphic Materials
Unit 3:	Production of Three-Dimensional Models and Improvised Scientific Equipment

Unit 1

Improvisation in Education: Concept, Rationale, and Principles

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3.1 Concept and Definition of Improvisation in Educational Material Production

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3.3 Principles of Effective Improvisation

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5.0 Summary

6.0 Tutor-Marked Assignment (TMA)

7.0 References/Further Reading

1.0 Introduction

Welcome to Module 7. At this stage of your study, you are moving from understanding theories and design principles of instructional resources to actually producing them. This shift is significant because it transforms you from a consumer of instructional materials into a creator.

Let us consider the idea of improvisation within education. Improvisation refers to the creative and intentional process of designing instructional materials using locally available and low-cost resources. It is important to note that improvisation is not a desperate reaction to lack of resources; rather, it is a well-established pedagogical practice grounded in progressive educational thought.

Historically, teachers across African contexts, including Nigeria, have demonstrated remarkable ingenuity by creating teaching materials from clay, seeds, palm fronds, and other natural resources. This tradition aligns with the advocacy of organizations such as UNESCO, which emphasize the use of locally relevant and accessible learning resources to improve educational outcomes.

In this unit, you will explore the concept of improvisation, understand why it is essential in Nigerian schools, and examine the guiding principles that ensure improvised materials are effective and meaningful.

2.0 Learning Outcomes

At the end of studying this unit, you should be able to:

1. Define improvisation in the context of educational material production.
2. Explain the educational and contextual rationale for producing improvised instructional materials.
3. State and explain the principles that guide effective improvisation of instructional materials.

3.0 Main Content

3.1 Concept and Definition of Improvisation in Educational Material Production

In everyday usage, improvisation simply means making use of available resources to create something functional. However, within educational material production, the concept takes on a more structured and intentional meaning.

Improvisation can be understood as a deliberate and creative process of designing instructional materials using locally sourced, low-cost, or even waste materials, with the aim of achieving specific learning objectives. At this point, it is important to emphasize the word *deliberate*. Improvised materials are not accidental creations; they are carefully planned, designed, and evaluated just like commercially produced materials.

An improvised instructional material (IIM) refers to any teaching or learning resource produced using materials readily available in the local environment. These may include charts, models, real objects, laboratory apparatus, instructional games, or even simple digital recordings produced with mobile devices.

Improvisation versus Substitution:

It is important to distinguish between improvisation and mere substitution. Substitution involves using one existing material in place of another (for example, using a large sheet of paper instead of a whiteboard). Improvisation goes further it involves creatively designing and producing a new material that achieves a specific instructional purpose. The improviser is not just a substitute consumer; they are an original creator.

Scope of Improvised Instructional Materials:

- Charts and diagrams drawn on card paper, cloth, or wood.

- Models constructed from clay, cardboard, wire, bottle tops, seeds, or scrap materials.
- Real-object collections (realia) assembled from the natural environment.
- Improvised laboratory equipment made from locally available materials.
- Instructional games and puzzles designed and produced by teachers or learners.
- Puppets, figurines, and props for dramatic instruction.
- Locally produced audio recordings and simple videos using mobile phones.
- Flash cards, word walls, and letter tiles for language education.

Self-Assessment Exercise(s)

1. Define improvisation in the context of educational material production, distinguishing it from mere substitution.

2. What is an improvised instructional material (IIM)? Give five examples relevant to secondary school education.

3. Why is it important to approach improvisation as a 'deliberate' and 'principled' process rather than an informal makeshift activity?

3.2 Rationale for Improvised Instructional Materials in Nigerian Schools

The use of improvised instructional materials in Nigerian schools is supported by several interconnected reasons. Let us examine these rationales carefully.

Practical Rationale; Addressing Resource Gaps:

The most immediately obvious rationale for improvisation is the persistent inadequacy of commercially produced instructional materials in many Nigerian schools, particularly in rural and peri-urban public school settings. Budget constraints at the federal, state, and school levels mean that many schools lack sufficient textbooks, laboratory equipment, audiovisual materials, and other standard resources. Improvisation allows teachers to fill these gaps creatively, ensuring that the absence of commercial materials does not condemn learners to impoverished educational experiences.

Pedagogical Rationale; Concrete Learning Experiences:

Even when commercial materials are available, improvised materials frequently offer superior pedagogical value for specific learning objectives. A model of the human ear constructed from cardboard, wire, and a balloon membrane may do more to help learners understand the mechanics of sound transmission than a commercially produced poster because the construction process itself becomes a learning experience, and the resulting model provides a tangible referent for abstract concepts.

Cultural Rationale; Locally Relevant Content:

Commercial instructional materials, particularly those produced outside Nigeria, frequently feature cultural contexts, images, names, and examples that are unfamiliar or irrelevant to Nigerian learners. Teacher-produced improvised materials can be specifically designed to embed curriculum content in familiar cultural contexts using Nigerian names in word problems, featuring local plants and animals in biology charts, and illustrating economic concepts with local market examples. This cultural relevance makes learning more accessible and meaningful.

Developmental Rationale; Building Teacher Capacity:

The process of designing and producing improvised instructional materials is itself a powerful form of professional development. Teachers who engage in improvisation develop deeper understanding of the curriculum content they are teaching, strengthen their instructional design skills, and build problem-solving and creative competencies that enhance their overall professional effectiveness.

Learner Engagement Rationale; Promoting Active Learning:

When learners participate in the production of instructional materials constructing models, illustrating charts, designing games they engage at a deep level with the content being represented. The process of producing a material forces the producer to think carefully about the concept being illustrated, organizing and clarifying their own understanding in the process. This is sometimes called 'learning by making' or, more formally, constructionist learning.

Economic Rationale; Cost-Effectiveness:

Improvised instructional materials produced from locally available and waste materials are dramatically less expensive than commercially produced alternatives. This cost-effectiveness makes them accessible to schools with limited budgets and reduces dependence on external funding and procurement processes that are often slow, unreliable, and subject to corruption.

Self-Assessment Exercise(s)

1. State and explain four rationales for improvising instructional materials in Nigerian schools.

2. How does learner participation in the production of improvised materials contribute to learning? Explain the concept of 'constructionist learning'.

3. . Critically evaluate the claim that improvised materials are inferior to commercial materials

3.3 Principles of Effective Improvisation

At this point, it is essential to recognize that not all improvised materials are effective. The quality of an improvised material depends on how well it adheres to established principles.

Principle 1: Instructional Validity:

The primary criterion for any improvised material is that it must accurately represent the concept it is intended to teach. A model of the water cycle that incorrectly shows water moving upward from rivers to clouds without explaining evaporation is worse than no model at all it will create misconceptions that are difficult to correct. Instructional validity requires that improvised materials be technically accurate, conceptually clear, and aligned with the learning objective they are designed to support.

Principle 2: Simplicity and Clarity:

Improvised materials should be as simple as possible while still adequately representing the concept. Overly complex improvised materials confuse learners and are difficult to produce and maintain. The designer should identify the single most important feature of the concept to be illustrated and ensure that this feature is prominent and clear in the material.

Principle 3: Visibility and Legibility:

Materials designed for classroom display or group use must be large enough and clear enough for all learners to see and read from any position in the room. Charts should use lettering large enough to be read from the back of the classroom; models should be large enough for learners in a small group to observe the key features clearly.

Principle 4: Durability:

Improvised materials should be constructed to withstand repeated use. A chart that falls apart after one lesson is a waste of time and materials. Strategies for improving durability include: using stiff card rather than paper for charts; laminating printed materials with transparent plastic; reinforcing models with wire or tape; and storing materials carefully between uses.

Principle 5: Safety:

All improvised materials must be safe for use by learners. This means avoiding sharp edges and points; using non-toxic materials; ensuring that small components are not detachable and swallowable by young learners; and avoiding materials that may cause allergic reactions. Safety is a non-negotiable requirement, not an afterthought.

Principle 6: Learner Appropriateness:

Materials must be appropriate for the age, developmental level, and cultural context of the target learners. A material designed for JSS 1 learners should use simpler language, larger images, and more colorful design than one designed for SS 3 learners.

Principle 7: Aesthetic Quality:

While improvised materials need not match the production quality of commercial products, they should be as neat, attractive, and carefully finished as the available materials and the producer's

skills allow. An attractively presented improvised material communicates respect for the learners and for the learning process, and is more likely to stimulate interest and engagement.

Principle 8: Evaluation and Revision:

Every improvised material should be evaluated after use through teacher self-reflection, learner feedback, and assessment of whether learners achieved the intended objective and revised based on the evidence gathered.

Self-Assessment Exercise(s)

1. State and explain any five principles of effective improvisation of instructional materials.

2. How does the principle of 'instructional validity' differ from the principle of 'simplicity and clarity'? Give an example of how violating each principle would harm learning.

3. A teacher produces a papier-mâché model of a volcano for a geography lesson. Evaluate this model against the principles of durability, safety, and visibility.

4.0 Conclusion

In this unit, you have explored the foundational concepts of improvisation in educational material production. You have seen that improvisation is not merely a response to limited resources but a deliberate, creative, and pedagogically sound practice.

You have also examined the various reasons why improvisation is essential in Nigerian schools and identified the principles that ensure improvised materials are effective. These insights will guide your practical activities in subsequent units.

5.0 Summary

In this unit, you have learnt that:

Improvisation in education is a deliberate and principled process of creating instructional materials using locally available resources. Improvised instructional materials must achieve the same pedagogical effectiveness as commercial materials. The rationale for improvisation includes practical, pedagogical, cultural, developmental, learner engagement, and economic considerations. Effective improvisation is guided by principles such as instructional validity, simplicity, visibility, durability, safety, learner appropriateness, aesthetic quality, and evaluation. Learner involvement in material production supports constructionist learning and enhances understanding.

6.0 Tutor-Marked Assignment (TMA)

1. Define improvisation in educational material production. How does it differ from mere substitution?
2. Identify and explain six rationales for improvising instructional materials in Nigerian schools.
3. State eight principles of effective improvisation. For each principle, give one example of how violating it would harm the instructional effectiveness of a material.

4. Explain the concept of constructionist learning and describe how it applies when learners participate in producing their own instructional materials.
5. Design a plan for a class-based improvised material production activity in which Secondary School 2 students produce a set of biology charts for classroom display.

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Unit 2

Production of Improvised Visual and Graphic Materials

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3.2 Producing Educational Posters and Display Materials

3.3 Producing Graphic Educational Materials: Flash Cards, Instructional Games, and Story Materials

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6.0 Tutor-Marked Assignment (TMA)

7.0 References/Further Reading

1.0 Introduction

In Unit 1, you established the conceptual and principled foundation for improvisation. In this unit, we move from theory to practice. Let us now consider how improvised instructional materials are actually produced in real classroom settings.

This unit focuses on two broad categories of instructional materials: visual display materials (such as charts, diagrams, and posters) and graphic educational materials (including flash cards, instructional games, and story-based resources). These materials are particularly relevant in contexts like Nigeria, where teachers often rely on locally available resources to support teaching and learning.

It is important to note that producing these materials does not require highly specialized skills. Rather, what is essential is a clear instructional purpose, an understanding of design principles, and a willingness to apply creativity and effort. This aligns with the philosophy of organizations such as UNESCO, which emphasizes accessibility and contextual relevance in educational resource development.

As you progress through this unit, you will be guided step-by-step through the production processes, ensuring that the materials you create are not only functional but also pedagogically effective. By the end, you should be able to confidently design and produce a range of improvised instructional materials suited to your teaching context.

2.0 Learning Outcomes

At the end of studying this unit, you should be able to:

- i. Produce improvised instructional charts and diagrams using a systematic process
- ii. Design and produce educational posters and display materials using locally available resources
- iii. Develop graphic educational materials such as flash cards, instructional games, and story materials

3.0 Main Content

3.1 Producing Improvised Instructional Charts and Diagrams

Let us begin with instructional charts, which are among the most widely used visual materials in classrooms. The ability to produce clear, accurate, and visually engaging charts is a fundamental competency for any educational technologist.

Materials Required for Chart Production:

- Manila card, cardboard, plywood, or thick fabric (for the chart surface).
- Pencil and ruler (for layout and lettering guides).
- Markers, poster paint, crayons, or natural dyes (for coloring and lettering).
- Compass and protractor (for geometric diagrams).
- Clear adhesive or laminating plastic (for protection and durability).
- String or wire (for hanging the chart).

Step-by-Step Chart Production Process:

Step 1: Define the Instructional Purpose: Before picking up a pencil, be absolutely clear about the single concept, process, or relationship this chart will communicate. Write a draft objective: 'After studying this chart, learners will be able to identify/describe/classify...'

Step 2: Gather Reference Materials: Research the content to be illustrated to ensure accuracy. Consult textbooks, reference books, or verified online sources. Technical accuracy is non-negotiable a chart that teaches incorrect science or history is worse than no chart.

Step 3: Create a Rough Sketch: On scrap paper, sketch a rough layout of the chart, experimenting with different arrangements of the visual and text elements. Determine the visual hierarchy what should be largest and most prominent? How should the information flow? At this stage, also decide on the color scheme.

Step 4: Prepare the Chart Surface: Cut the chart material to size. A standard classroom chart is typically 60 cm x 90 cm, though size may vary based on classroom dimensions and available material. Ensure the surface is clean, smooth, and free from wrinkles.

Step 5: Transfer the Layout: Using a ruler and pencil, lightly mark out the main areas of the chart on the chart surface the title area, the main illustration area, the caption area, and any legend or key. Use a grid of light pencil lines to guide lettering and ensure alignment.

Step 6: Draw the Illustrations: Draw the main illustrations in pencil first, then ink over them with marker or paint. Use simple, clear lines; avoid excessive detail that will be invisible from a distance. For diagrams requiring precise proportions, use a compass, protractor, and ruler.

Step 7: Add Labels and Text: Add all labels, captions, and text using clear, consistent lettering. Block capitals are generally more legible than cursive for display charts. Ensure that text is large enough to read from the back of the classroom (minimum 3 cm letter height for main labels).

Step 8: Apply Color: Add color systematically, using your predetermined color scheme. Apply lighter colors first and allow each layer to dry before applying the next. Use color purposefully to highlight categories, show relationships, or distinguish between different parts of a diagram.

Step 9: Add Finishing Details: Add a clear, prominent title; a legend or key if needed; and the subject, class level, and date of production in small print at the bottom of the chart.

Step 10: Protect and Store: If laminating plastic is available, cover the completed chart with transparent plastic to protect it from moisture and physical damage. Punch holes in the top corners and attach string for hanging. Store flat or rolled in a protective tube when not in use.

Self-Assessment Exercise(s)

1. Describe the ten-step process for producing an improvised instructional chart.
2. What materials are needed to produce a hand-drawn instructional chart? Which of these materials can be obtained free of charge or at very low cost in a typical Nigerian school?
3. Using the production process described in this section, produce a plan (rough sketch and materials list) for a chart on the life cycle of the mosquito for a JSS 2 biology class.

3.2 Producing Educational Posters and Display Materials

At this point, let us consider educational posters, which differ from charts in both purpose and design. While charts provide detailed information, posters are designed to communicate a single powerful message with strong visual impact.

Materials for Poster Production:

- Thick card, cartridge paper, or smooth plywood (for durability and surface quality).
- Poster paints, acrylic paints, or thick markers (for bold, clear imagery).
- Stencils or cut-out templates (for consistent lettering and shapes).

- Photographs from old magazines or newspapers (as collage elements, where relevant).
- Natural dyes from plants such as turmeric (yellow), indigo leaves (blue), or hibiscus (red), which can be used as low-cost coloring agents.
- Varnish or clear nail polish (as a protective finish, especially in humid climates).

Poster Design and Production Process:

The production process for a poster follows the same broad steps as chart production, but with significantly more emphasis on visual impact and less emphasis on detailed informational content. Key design priorities for posters are: a single dominant visual image that communicates the core message at a glance; a brief, memorable headline or slogan; and minimal supporting text.

For hand-lettered posters, a stencil can significantly improve the consistency and legibility of lettering. Simple stencils can be cut from thin card using a craft knife or a sharp pair of scissors. Teachers who lack confidence in freehand lettering may find stencil-assisted lettering a significant practical aid.

Producing Flannel Board Materials:

A flannel board can be produced by stretching a piece of flannel cloth over a stiff cardboard backing and securing it at the back with tape or staples. Cut-out figures for use on the flannel board can be made from card or thick paper and backed with pieces of sandpaper, rough fabric, or Velcro, which will adhere to the flannel surface. Flannel board figures can be colored with crayons, markers, or paint, and laminated for durability.

Bulletin Board Display Production:

A low-cost bulletin board can be produced by attaching cork tiles, compressed fibreboard, or layers of corrugated cardboard to a wooden frame or directly to a classroom wall. The board can be covered with colored paper or fabric to create an attractive background for displays. Materials can be attached using drawing pins, paper clips, or adhesive putty.

Self-Assessment Exercise(s)

1. Describe the key differences in design approach between an instructional chart and an educational poster.

2. How can natural plant-based dyes be used as low-cost coloring materials for improvised instructional materials? Give three specific examples.

3. Describe how to produce a functional flannel board and a set of flannel board figures using locally available materials.

3.3 Producing Graphic Educational Materials: Flash Cards, Instructional Games, and Story Materials

Beyond charts and posters, graphic educational materials include a wide range of smaller-scale items that provide hands-on, interactive learning experiences: flash cards, instructional games, puzzles, story cards, and illustrated reference booklets. These materials are particularly valuable for primary and junior secondary education, where tactile and interactive engagement is especially important for learning.

Flash Cards:

Flash cards are small cards bearing a word, image, number, or symbol on one or both sides, used for vocabulary development, mathematical fact practice, and concept reinforcement. They are one of the most versatile and easily produced improvised materials available. To produce flash cards: cut card into uniform pieces (typically 10 cm x 15 cm); write or draw the target item (word, number, image) on one side; write the definition, translation, answer, or related item on the reverse; laminate or cover with clear adhesive for durability; store in rubber-band-bound sets organized by topic.

Instructional Card Games and Puzzles:

Simple card games and puzzles can be produced as improvised instructional materials that simultaneously develop content knowledge and thinking skills. Examples include: matching games (matching vocabulary words to their definitions, or mathematical expressions to their values); sorting games (classifying items into categories); sequence cards (arranging historical events or process steps in correct order); and puzzle boards (jigsaw-style puzzles built around a diagram or illustration that learners must assemble correctly).

To produce a card game: define the learning objective and game format; draft the content for each card on paper; transfer to card and illustrate; laminate or cover with clear plastic; produce a simple set of written game instructions; test the game with a small group of learners; and revise based on feedback.

Story and Narrative Materials:

Story-based learning is particularly effective in primary and early secondary education, and a range of simple materials can support narrative instruction. Big books (large-format illustrated story books produced on card or thick paper) are effective for shared reading activities. Story

sequence cards (a set of illustrated cards showing a story or process in panels) support comprehension and retelling skills. Puppets and figurines (produced from cloth, paper, clay, or waste materials) can animate stories and make abstract characters and events concrete and engaging.

Word Walls and Reference Displays:

A word wall is a systematic display of key vocabulary words, mounted on the classroom wall at learner eye level, organized alphabetically, by topic, or by-word family. Word walls provide ongoing vocabulary reference and support incidental vocabulary learning. To produce a word wall: write or print key words in large, clear letters on individual card strips; add a simple illustration or definition if space allows; mount at eye level on a designated section of classroom wall; update regularly as new vocabulary is introduced.

Self-Assessment Exercise(s)

1. Describe how to produce a set of flash cards for vocabulary development in a secondary school French language class.

2. Design an instructional card game for teaching classification of living organisms to a JSS 2 biology class. Describe the objective, format, production process, and game rules.

3. What is a word wall? Describe the process of producing and maintaining an effective word wall for a secondary school classroom.

4.0 Conclusion

In this unit, you have explored the practical production of improvised instructional materials.

From charts and posters to flash cards and instructional games, each material serves a unique role in enhancing teaching and learning.

It is important to note that effective instructional materials are not defined by their cost but by their relevance, clarity, and alignment with learning objectives. By applying systematic production processes and sound design principles, you can create materials that significantly improve learner engagement and understanding.

5.0 Summary

In this unit, you have learnt that:

In this unit, you have learnt that instructional charts require a structured production process to ensure clarity and accuracy. You have also seen that posters prioritize visual impact and simplicity, while graphic materials such as flash cards and instructional games support interactive learning.

Furthermore, you have understood that locally available materials, including natural dyes and recycled resources, can be effectively used in instructional material production. Finally, it is essential to test all materials with learners and refine them based on feedback.

6.0 Tutor-Marked Assignment (TMA)

1. Describe the step-by-step process for producing a high-quality improvised instructional chart on the human digestive system.
2. Design and produce a plan (with rough sketches) for an educational poster on malaria prevention for display in a rural school clinic waiting area.
3. Describe how to produce a functional flannel board and a set of figures for teaching food chains in primary science.
4. Design an instructional card game for teaching the causes of the Nigeria Civil War to an SS 2 history class. Include objectives, card content, game rules, and a production materials list.
5. How can word walls be used to support vocabulary development in a secondary school English language classroom? Describe the production and management of an effective word wall.

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Unit 3

Production of Three-Dimensional Models and Improvised Scientific Equipment

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6.0 Tutor-Marked Assignment (TMA)

7.0 References/Further Reading

1.0 Introduction

In the previous units of Module 7, your focus was on two-dimensional instructional materials. In this unit, we move a step further into the world of three-dimensional instructional resources. Let

us consider how learning changes when students are no longer limited to flat images but can interact with objects they can hold, rotate, and manipulate.

Three-dimensional models and improvised scientific equipment provide learners with tactile and experiential learning opportunities that cannot be achieved through charts or textbooks alone. For instance, a working model of the human heart, a miniature traditional compound, or a simple electrostatic setup allows learners to engage directly with concepts that might otherwise remain abstract.

It is important to note that such materials are especially valuable in science, technology, geography, and vocational education. They promote deeper understanding by linking theory with physical experience. This aligns with recommendations from organizations such as UNESCO, which emphasize the importance of hands-on and resourceful teaching approaches in developing contexts.

In this unit, you will learn how to produce four major categories of three-dimensional instructional materials: biological and anatomical models, geography and social science models, improvised physical science equipment, and mathematical manipulatives.

2.0 Learning Outcomes

At the end of studying this unit, you should be able to:

- i. Produce improvised biological and anatomical models using locally available materials.
- ii. Produce improvised models for geography, social science, and cultural education.
- iii. Produce improvised equipment for physical science demonstrations and mathematical manipulatives.

3.0 Main Content

3.1 Producing Biological and Anatomical Models

Biology is inherently a three-dimensional subject. Structures such as cells, organs, and ecosystems exist in space, and their functions are closely tied to their forms. At this point, it becomes clear that learners grasp these concepts more effectively when they can observe and manipulate physical representations.

Materials for Biological Model Production:

- Clay and mud (for sculpting organs, cell components, and land forms).
- Papier-mâché (newspaper strips soaked in flour paste, built up over a form excellent for large, lightweight models).
- Balloons (for demonstrating expansion and membrane properties).
- Styrofoam or sponge (for soft tissue models).
- Seeds, beans, buttons, and bottle caps (for representing cell organelles).
- Wire (for structural frameworks).
- Plastic bags (for representing membranes and containing fluid models).
- Local plant materials (for ecology and botany specimens).

Production Example 1: Model Animal Cell:

Objective: Learners will identify and name the main organelles of an animal cell. Materials: A large clear plastic bag or balloon (cell membrane), gelatin or water (cytoplasm), grape or round stone (nucleus), small seeds (mitochondria), larger seeds (ribosomes), twist-tied plastic bags

(vacuoles). Method: Fill the large clear bag with gelatin solution; insert the representing objects in appropriate positions; seal the bag. Label each organelle with small paper flags attached to toothpicks. The resulting model is three-dimensional, manipulable, and directly demonstrates the fluid nature of the cytoplasm and the relative positions of organelles.

Production Example 2: Model of the Heart:

Objective: Learners will describe the four chambers of the human heart and trace the path of blood flow. Materials: Papier-mâché, wire framework, red and blue paint (representing oxygenated and deoxygenated blood), rubber tubing (representing blood vessels). Method: Construct a wire framework in the approximate shape of the heart; apply layers of papier-mâché over the framework; allow to dry completely; cut open or build as two halves to reveal internal chambers; paint chambers and label all structures; attach rubber tubing to represent incoming and outgoing blood vessels.

Production Example 3: Ecosystem Diorama:

Objective: Learners will identify the components of a grassland ecosystem and describe their relationships. Materials: A cardboard box, clay or papier-mâché for terrain, dried grass and twigs, painted stones, small clay or paper animal figures, blue cellophane for water bodies. Method: Cut away the front of the box; create a terrain base using layered clay; add natural materials (grass, twigs, sand) to represent vegetation; add small clay figures of animals; label each component. The resulting diorama provides a permanent, three-dimensional reference for ecosystem concepts.

Self-Assessment Exercise(s)

1. What materials can be used to produce improvised biological models? List six materials and the type of structure each is best suited for representing.

2. Describe the step-by-step production process for an improvised model of the human heart using papier-mâché and wire.

3. Design a plan for producing an ecosystem diorama that could be used in a JSS 3 integrated science class. Include the objective, materials, production steps, and how learners would interact with the model.

3.2 Producing Models for Geography, Social Science, and Cultural Education

Geography and social sciences deal with real-world environments and cultural systems that are inherently three-dimensional. Let us consider how improvised models can make these subjects more meaningful and engaging.

Relief Maps and Landform Models:

A relief map is a three-dimensional representation of a geographic area showing the physical terrain mountains, valleys, rivers, plains, and plateaus. Relief maps are among the most powerful geographic teaching tools because they allow learners to directly observe the spatial relationships between physical features that are very difficult to perceive from flat, two-dimensional maps.

To produce an improvised relief map of Nigeria or a local geographic area: draw the outline of the area on a flat cardboard base; build up elevated areas using layered papier-mâché or clay,

with height proportional to the actual elevation; allow to dry and harden; paint different elevation zones in appropriate colors (green for lowlands, brown for highlands, blue for water bodies); add labels for major features using small paper flags.

Traditional Architecture and Settlement Models:

Models of traditional Nigerian compounds, Hausa walls, Yoruba agbo-ile (family compound), Igbo obi (meeting house), or Nupe riverside village can make social studies, cultural studies, and geography lessons richly concrete. These models can be built from clay, mud, sticks, dried grass, and other natural materials making them culturally authentic as well as instructionally effective.

When learners participate in building traditional architecture models, they engage in a form of cultural learning that textbooks cannot provide learning about construction techniques, spatial organization, social meanings, and material culture through their hands as well as their minds.

Historical and Socio-Cultural Artifacts:

Where original cultural artifacts cannot be brought into the classroom, reproductions made from clay, metal wire, or carved wood can serve as effective instructional resources. A reproduction of a traditional Nok terra cotta figure, an Igbo ofo staff, or a Benin bronze plaque (simplified in form but accurate in key features) can anchor historical and cultural lessons in tangible, observable reality.

Economic and Development Models:

For economics and entrepreneurship education, simple models of production systems, supply chains, or market structures can be built from card and common materials. A model marketplace, with small card stalls representing different sectors of the economy, can be used to teach market structure, price discovery, and economic geography.

Self-Assessment Exercise(s)

1. Describe how to produce an improvised relief map of Nigeria for use in a secondary school geography class. Include the materials, production process, and educational applications.

2. How can models of traditional Nigerian architecture support cultural education in a secondary school? Describe a specific model and how it would be used in a lesson.

3. Design a model economic marketplace that could be used to teach market structure and price setting to an SS 1 economics class.

3.3 Improvised Physical Science Equipment and Mathematical Manipulatives

One of the greatest challenges in Nigerian science education is the inadequacy of laboratory equipment in many secondary schools. Practical work is essential for developing scientific understanding and skills, yet many schools conduct science as a purely theoretical subject because of the absence of laboratory materials. Improvised scientific equipment offers a powerful solution enabling practical work even in the most resource-limited settings.

Improvised Physics Demonstration Equipment:

Simple Pendulum: A length of string and a heavy stone or metal nut constitute a functional simple pendulum for demonstrating the principles of periodic motion, the relationship between pendulum length and period, and the conservation of mechanical energy. This can be produced in minutes at virtually zero cost.

Lever System: A rigid flat piece of wood (e.g., a school ruler or a plank), balanced over a raised fulcrum (e.g., a wooden block), with labeled positions for load and effort, provides a functional demonstration of lever mechanics. Different materials (stones, books, bags of sand) can serve as loads.

Electrostatic Demonstrations: A plastic pen, comb, or piece of PVC pipe rubbed vigorously on hair or dry cloth becomes a simple electrostatic generator. Small pieces of paper, dried leaves, or thread will be attracted to the charged object, demonstrating electrostatic induction.

Convection Currents: A transparent glass or plastic container, a candle, food coloring, and hot and cold water can demonstrate convection currents clearly and directly.

Improvised Chemistry Demonstration Equipment:

A simple acid-base indicator can be produced from red hibiscus flowers or red cabbage juice both of which change color in acidic and alkaline solutions, providing a visible indicator without the cost of commercially produced litmus paper. A basic filtration apparatus can be assembled from a cut plastic bottle, filter paper (from coffee filters or folded tissue), sand, and gravel.

Mathematical Manipulatives:

Mathematical manipulatives are physical objects that learners handle as a way of developing mathematical understanding. Improvised examples include: counting sticks and stones for arithmetic operations; fraction strips cut from card for fraction concepts; geometric shape tiles cut from card for area, perimeter, and symmetry; abacuses constructed from wire and beads; and place value charts with movable cards for understanding number structure.

The key principle of mathematical manipulative use is that the physical manipulation should be directly connected to the mathematical procedure being taught so that learners build a mental representation of the abstract operation through their physical experience of the manipulation.

Safety in Improvised Science Equipment:

- Never improvise equipment for high-voltage electrical experiments.
- Avoid glass substitutes that may shatter dangerously under heat.
- Ensure that all chemical substitutes used are genuinely non-hazardous.
- Supervise all practical activities closely, regardless of how simple the equipment appears.
- Conduct a safety risk assessment before any improvised practical activity.

Self-Assessment Exercise(s)

1. Describe how to produce and use four pieces of improvised physics demonstration equipment from locally available materials.

2. How can red hibiscus flowers or red cabbage juice be used as a substitute for commercially produced Ph indicators in a chemistry class? Describe the production and use of this improvised indicator.

3. Design a set of mathematical manipulatives for teaching fractions to a JSS 1 class. Specify the materials, production process, and how the manipulatives would be used in a lesson.

4.0 Conclusion

This unit has expanded your understanding of instructional material production by introducing three-dimensional models and improvised scientific equipment. You have seen how simple, locally available materials can be transformed into effective teaching tools across multiple subject areas.

By integrating these materials into your teaching practice, you can create engaging, hands-on learning experiences that promote deeper understanding and active participation among learners.

5.0 Summary

In this unit, you have learnt that biological models can be constructed using materials such as clay, papier-mâché, and plastic to represent complex structures like cells and organs. You have also learnt that geography and social science concepts can be effectively taught using relief maps, cultural models, and economic simulations.

Furthermore, you have explored how improvised scientific equipment enables practical science teaching, even in resource-constrained environments, and how mathematical manipulatives support conceptual understanding. Finally, you have understood that safety is essential in all improvisation activities.

6.0 Tutor-Marked Assignment (TMA)

1. Describe the production of three improvised biological models and explain their instructional uses.

2. Explain how an improvised relief map can enhance geography teaching, including production steps.
3. Identify and describe five improvised physics demonstration tools and their classroom applications.
4. Design a complete improvised setup for a filtration experiment using locally available materials.
5. Discuss the importance of safety in improvised science activities and outline necessary precautions.

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Module 8

Locally Available Resources as Instructional Materials

Unit 1:	Natural Resources as Instructional Materials
Unit 2:	Cultural, Community, and Human-Made Materials as Instructional Resources
Unit 3:	Waste and Recycled Materials as Instructional Resources

Unit 1

Natural Resources as Instructional Materials

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3.2 Earth Science and Physical Environment Materials

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6.0 Tutor-Marked Assignment (TMA)

7.0 References/Further Reading

1.0 Introduction

Welcome to this unit on *Natural Resources as Instructional Materials*. In the previous module, you focused on developing improvised instructional materials. In this module, however, we shift attention to something equally powerful—using materials that already exist in the natural and human environment.

Let us consider a simple example. A learner who observes a real soil profile in a freshly dug pit develops a deeper understanding than one who merely studies a diagram. Similarly, examining a real leaf under a hand lens provides richer insight than reading a description in a textbook. This aligns with the philosophy of experiential learning strongly advocated by organizations such as UNESCO, which emphasizes learning through direct interaction with real-world materials.

At this point, it is important to note that natural resources offer authenticity, immediacy, and relevance in teaching. This unit therefore explores how biological specimens and earth science materials can be identified, collected, prepared, and integrated across subject areas to enhance learning.

2.0 Learning Outcomes

At the end of studying this unit, you should be able to:

1. Identify natural materials from the biological and physical environment that can be used as instructional resources.
2. Describe methods for collecting, preparing, and preserving natural biological and earth science specimens.
3. Explain how natural materials can be integrated into lessons across different subject areas.

3.0 Main Content

3.1 Biological Specimens as Instructional Resources

Nigeria's rich ecological diversity—from mangrove forests to savanna regions—provides abundant biological materials that can support teaching in biology, agriculture, and environmental science. The key challenge lies not in availability, but in effective and ethical utilization.

Types of Biological Specimens:

- Plant specimens: Leaves (demonstrating venation patterns, surface features, and modifications); flowers (for reproduction studies); roots (tap and fibrous); stems (herbaceous and woody); seeds and fruits; bark and wood sections.
- Animal specimens: Insects (for arthropod morphology studies); molluscs and crustaceans (shells and exoskeletons); small preserved fish (for vertebrate anatomy); bird feathers and small bones.
- Microbial and fungal materials: Bread mould cultures; mushroom specimens; algae cultures.
- Ecological samples: Soil and litter invertebrates collected by sieving; water samples from ponds, streams, or rivers (for microscopic examination).

Collecting Biological Specimens Ethical Considerations:

The collection of biological specimens must be guided by ethical principles that ensure the sustainability of local ecosystems. Key guidelines include: collect only what is needed for instructional purposes; avoid collecting rare or endangered species; collect living specimens only when necessary and use preserved, dried, or photographed alternatives where possible; return living organisms to their natural habitat after observation; involve learners in responsible collection as an opportunity to teach environmental ethics.

Preparing and Preserving Plant Specimens:

Pressing and drying: Freshly collected leaves and flowers can be pressed between newspaper sheets under heavy books, or in a simple plant press (two boards of wood held together with wing-nut bolts, with layers of newspaper and absorbent material between them). After 1–2 weeks of pressing and drying, specimens can be mounted on card and labeled with the plant name, collection location, and date. Spirit preservation: Soft plant and animal tissues can be preserved in 70% ethanol solution (made by diluting locally available methylated spirits with water) in sealed jars.

Preparing Dry Animal Specimens:

Insect collections: Insects can be collected using a simple sweep net (a cloth bag attached to a bent wire hoop), pinned on a soft foam board while fresh, and allowed to dry into permanent specimens. Bones and shells can be cleaned by soaking in water (to remove soft tissue), brushing, and drying in sunlight. Feathers can be cleaned with mild soap solution, rinsed, and dried flat.

Self-Assessment Exercise(s)

1. List five types of biological specimens that can be collected from the local environment for use in secondary school biology lessons.

2. What ethical principles should guide the collection of biological specimens from natural environments?

3. Describe the steps involved in preparing a plant specimen using the pressing and drying method.

3.2 Earth Science and Physical Environment Materials

Beyond biological resources, the physical environment offers valuable instructional materials such as rocks, minerals, soils, water, and atmospheric elements. These resources are particularly useful in teaching geography, physics, chemistry, and integrated science.

Rock and Mineral Collections:

A school rock and mineral collection is one of the most durable and educationally valuable locally produced resources a teacher can develop. Rocks and minerals are abundant in Nigeria's diverse geological environment from the granite outcrops of the Jos Plateau to the sedimentary rocks of the Niger Delta and the basement complex rocks of central Nigeria.

To build a school rock collection: identify exposures of different rock types in the local area; collect small, representative hand specimens (fist-sized is ideal); clean specimens with water and a brush; label each specimen with the rock type, collection location, date, and student collector's name; store specimens in labeled compartments in a cardboard or wooden display tray.

Rock collections can be used to teach the rock cycle, rock classification (igneous, sedimentary, metamorphic), mineral identification (using simple physical tests such as hardness, color, luster, and cleavage), and the relationship between rock types and landforms.

Soil Profile Studies:

Soil profiles the vertical sequence of soil layers (horizons) from the surface down to bedrock are among the most important and most accessible earth science resources available in any school environment. A freshly dug pit, or the exposed wall of any excavation or erosion gully, reveals the soil profile directly. Learners can observe, describe, and collect samples from different horizons, and compare profiles from different locations (e.g., under forest, under farmland, near a stream) to understand the effects of land use and drainage on soil development.

Soil samples collected in sealed jars provide permanent classroom reference specimens that can be used for physical tests (texture, color, water-holding capacity) and chemical tests (pH using improvised hibiscus indicator).

Water and Atmospheric Materials:

Local water bodies ponds, rivers, streams, and wells provide materials for chemistry experiments (testing for pH, turbidity, and dissolved oxygen using improvised indicators), ecology studies (sampling aquatic organisms), and geography fieldwork (measuring stream discharge, identifying erosion features). Atmospheric phenomena such as rainfall, wind direction, temperature, and humidity can be measured using improvised instruments a rain gauge made from a cut plastic bottle, a wind vane made from card and a straw providing real, locally gathered weather data for geography lessons.

Self-Assessment Exercise(s)

1. Describe how to build a school rock and mineral collection from locally available materials. Include the collection, labeling, and storage process.

2. Explain how a soil profile study conducted at a nearby excavation or erosion gully could be used to teach soil science in a secondary school geography class.

3. Describe two improvised weather measuring instruments and explain how they can be used to gather locally relevant data for geography lessons.

3.3 Integrating Natural Materials Across Curriculum Subjects

Having identified and prepared natural materials from biological and physical environments, the key instructional challenge is integrating them effectively into specific curriculum lessons. This section explores how natural materials can be used across a range of subject areas beyond science.

Mathematics:

Natural objects seeds, shells, stones, sticks are ideal counting and sorting manipulatives for primary mathematics. Naturally occurring patterns (the Fibonacci sequence in sunflower heads and pine cones, the hexagonal geometry of honeycombs, the radial symmetry of starfish and daisies) provide extraordinary concrete illustrations of mathematical concepts for secondary learners. Measurement activities using natural reference points (estimating the height of a tree, measuring the circumference of a termite mound) develop practical numeracy skills.

Language Arts and Literacy:

Natural objects can serve as stimuli for descriptive writing (observe and describe a rock, a leaf, or an insect in detail); as props for storytelling and oral narrative (objects associated with local myths, proverbs, or folktales); and as concrete referents for vocabulary development (learning

the precise names of natural features, plant parts, animal characteristics, and weather phenomena extends scientific and descriptive vocabulary).

Social Studies and Geography:

Local soil, rock, and water samples connect abstract geography content to the learners' immediate environment. A lesson on the importance of water conservation is far more compelling when learners test the actual quality of water from their local stream. A lesson on deforestation and erosion is more meaningful when learners can observe the effects directly on the exposed soil of a local gully.

Cultural and Creative Arts:

Natural materials; clay, stone, wood, plant fibers, natural dyes, and feathers are the raw materials of Nigerian traditional art and craft. Using them in cultural and creative arts education not only provides authentic artistic media but also connects learners to the material culture and aesthetic traditions of their communities. A pottery lesson using local clay, a tie-dye lesson using local indigo leaves, or a weaving lesson using locally harvested grasses all achieve this dual purpose.

- Science: Biological specimens, rock collections, soil profiles, water samples.
- Mathematics: Counting manipulatives, geometric patterns, measurement activities.
- Language Arts: Descriptive writing stimuli, storytelling props, vocabulary development.
- Social Studies: Local resources illustrating geography, environmental, and economic concepts.
- Cultural Arts: Clay, natural dyes, fibers, and wood for authentic traditional art and craft.

Self-Assessment Exercise(s)

1. Give two specific examples of how natural materials can be used as instructional resources in mathematics education.

2. How can local natural materials be used as stimuli for language arts and literacy development in secondary school? Give a specific lesson example.

3. Describe a cross-curricular project in which secondary school learners use natural materials to simultaneously develop science, art, and language skills.

4.0 Conclusion

In this unit, you have explored the significant role of natural resources as instructional materials. You have learned how biological and earth science materials can be identified, collected, prepared, and preserved. More importantly, you have seen how these materials can be integrated across multiple subject areas to enrich teaching and learning.

At this point, it is evident that natural materials provide authentic, engaging, and contextually relevant learning experiences that support deeper understanding and skill development.

5.0 Summary

In this unit, you have learnt that:

In this unit, you have learnt that natural instructional materials include biological specimens such as plants, animals, and microorganisms, as well as physical resources like rocks, soils, and water. Ethical considerations are essential in collecting these materials to ensure sustainability. You have also learned various methods for preserving specimens and how to utilize them effectively in teaching. Finally, you explored how natural materials can be integrated across disciplines to promote holistic and meaningful learning experiences.

6.0 Tutor-Marked Assignment (TMA)

1. Describe the ethical principles that should guide the collection of biological specimens from natural environments.
2. Explain how to build a school rock and mineral collection. What curriculum topics can this collection support?
3. Design a soil science fieldwork activity for a secondary school geography class, using a local erosion gully or construction site as the study site.
4. Describe how natural materials can support cross-curricular learning, giving specific examples for science, mathematics, and cultural arts.
5. Plan a unit of study that uses locally available natural materials as the primary instructional resource for teaching ecosystems in a JSS 3 integrated science class.

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Unit 2

Cultural, Community, and Human-Made Materials as Instructional Resources

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4.0 Conclusion

5.0 Summary

6.0 Tutor-Marked Assignment (TMA)

7.0 References/Further Reading

1.0 Introduction

In Unit 1, you explored the educational potential of natural biological and earth science materials. In this unit, we shift attention to another equally rich category of locally available

resources—cultural materials, community artefacts, traditional knowledge objects, and human-made materials derived from everyday life.

Let us consider the Nigerian context. Nigeria is characterized by immense cultural diversity, with deeply rooted indigenous knowledge systems, craftsmanship, and artistic traditions present in virtually every community. These cultural and community materials are not merely artefacts; they embody history, identity, values, and practical knowledge accumulated over generations.

At this point, it is important to note that cultural materials play a unique role in educational technology. They bridge the gap between formal schooling and lived experience. For instance, a Yoruba proverb reflecting diligence, a Fulani woven mat pattern, or a Calabar masquerade costume each represents embedded knowledge that can enrich teaching across disciplines.

This unit, therefore, guides you to identify categories of cultural and community materials, understand their educational significance, and apply strategies for their respectful and effective integration into teaching and learning processes.

2.0 Learning Outcomes

At the end of studying this unit, you should be able to:

- i. Identify categories of cultural and community materials used as instructional resources
- ii. Explain the educational significance of cultural artefacts and traditional knowledge systems
- iii. Analyse the role of cultural materials in enhancing learner engagement and identity formation
- iv. Describe strategies for integrating cultural and community materials into formal education respectfully and effectively

3.0 Main Content

3.1 Categories of Cultural and Community Materials as Resources

Cultural and community materials include a wide range of artefacts, practices, and knowledge systems that reflect the values and lifestyles of specific communities. For effective instructional use, these materials can be grouped into distinct categories.

Category 1: Traditional Technology and Craft Artefacts:

Traditional tools, instruments, and craft products made by community artisans represent accumulated technological knowledge passed down through generations. Examples include: traditional farming tools (hoes, cutlasses, irrigation implements); traditional food processing equipment (mortars and pestles, grinding stones, calabash containers); traditional construction tools and building materials; traditional weaving equipment and woven textiles; traditional pottery and ceramics; and traditional musical instruments.

These artefacts can be used in science and technology education (studying materials, mechanisms, and energy), in vocational and home economics education (demonstrating traditional food production and craft techniques), and in cultural studies (exploring the relationship between tools and ways of life).

Category 2: Cultural and Ceremonial Objects:

Objects associated with ceremonies, rituals, festivals, and cultural practices include: masquerade costumes and masks; traditional leadership regalia; ceremonial vessels and implements; religious and spiritual objects; traditional currency and trade goods; and festival decorations and art objects. These objects are rich resources for social studies, history, cultural and creative arts, and civic education but must be engaged with sensitivity, cultural awareness, and appropriate permission from community authorities.

Category 3: Oral Literature and Linguistic Resources:

Oral literature; proverbs, folktales, riddles, oral histories, praise poetry, and songs represents the intellectual and aesthetic heritage of Nigerian communities. While not physical objects, oral literature resources are 'available' through the knowledge of community elders, storytellers, and griots, and can be recorded, transcribed, and used as rich educational materials. Oral literature resources support language arts education, moral and values education, social studies, history, and cultural studies.

Category 4: Traditional Knowledge Resources:

Traditional knowledge about plants (medicinal uses, agricultural applications, ecological relationships), animals (behavior, uses, conservation), weather and seasons, construction, navigation, and food production constitutes a vast, largely unwritten educational resource. Traditional knowledge holders; herbalists, farmers, hunters, fishermen, midwives, and craft specialists are the living repositories of this knowledge and can serve as human resources in the ways discussed in Module 3.

Category 5: Contemporary Community Materials:

Beyond traditional artefacts, contemporary community materials include: local market products and packaging (for science, economics, and health education); local newspapers and media (for language arts, social studies, and current affairs); community notice boards and signage (for literacy education); and built structures in the community (for geometry, measurement, and design education).

Self-Assessment Exercise(s)

1. Identify five categories of cultural and community materials and give two examples of each.

2. How can traditional farming tools be used as instructional resources in a secondary school agriculture or basic technology class?

3. What is oral literature? Give three examples and explain how each could be used in secondary school education.

3.2 Educational Significance of Cultural and Community Materials

The value of cultural and community materials extends beyond their physical presence. They contribute to learning at cognitive, affective, cultural, and social levels.

Grounding Abstract Concepts in Reality

Let us consider how abstract ideas become clearer through familiar materials. Scientific concepts such as energy transformation can be demonstrated using traditional fire-making tools. Similarly, simple machines can be illustrated using everyday tools like hoes and grinding stones. Mathematical concepts such as symmetry and proportion are visible in traditional weaving and pottery designs.

Affirming Cultural Identity and Relevance

When learners see their culture reflected in the classroom, it reinforces a sense of belonging and intellectual worth. Research in culturally responsive teaching highlights that such affirmation improves motivation and academic performance. Scholars like Geneva Gay emphasize the importance of aligning instruction with learners' cultural contexts.

Preserving Endangered Knowledge

It is important to note that many indigenous knowledge systems are at risk of extinction.

By integrating community knowledge into formal education, schools contribute to preserving valuable traditions. Organizations such as UNESCO advocate for safeguarding intangible cultural heritage through education.

Developing Critical Cultural Literacy

Engaging with cultural materials enables learners to critically examine their heritage. This promotes informed reflection, allowing learners to appreciate cultural strengths while questioning outdated or harmful practices. Such critical awareness is essential in a diverse and evolving society.

Self-Assessment Exercise(s)

1. Explain how traditional Nigerian technologies can be used to make abstract science concepts concrete and accessible for learners.

2. What does research on culturally responsive education say about the relationship between cultural affirmation in the classroom and academic outcomes?

3. iii. Describe how schools can contribute to preserving indigenous knowledge

3.3 Strategies for Respectful and Effective Integration of Cultural Materials

The integration of cultural materials into education must be handled with care, respect, and intentionality.

Strategy 1: Seek Community Permission and Guidance:

Before using cultural artefacts or knowledge in the classroom, seek permission from the appropriate community authorities' elders, traditional rulers, cultural custodians, or community organizations. This is not merely a courtesy; it is an acknowledgment that cultural knowledge is not public property and that its educational use must be sanctioned by those who hold it.

Strategy 2: Involve Community Experts:

The most authentic and educationally powerful engagement with cultural materials occurs when community experts' craftspeople, elders, ritual specialists are present to explain, demonstrate, and contextualize the material. Involving community experts in classroom engagements avoids the risk of misrepresentation and provides learners with access to the living knowledge embedded in the artefact or practice.

Strategy 3: Distinguish Educational from Ceremonial Use:

Many cultural objects have specific ceremonial or ritual contexts in which their use is appropriate. Removing an object from its ceremonial context and using it as a classroom display item may be seen as disrespectful or inappropriate. Be explicit about this distinction, and avoid using ceremonial objects in educational contexts unless community custodians have specifically sanctioned this use.

Strategy 4: Avoid Stereotyping and Overgeneralization:

Nigeria is home to hundreds of ethnic groups, each with distinct cultural practices, artefacts, and knowledge systems. Avoid the trap of treating 'Nigerian culture' as monolithic representing the practices of one group as universal, or presenting cultural diversity in a superficial, touristic way. Use specific examples from specific cultural contexts, and acknowledge the diversity of Nigerian cultural expression.

Strategy 5: Connect Cultural Materials to Specific Learning Objectives:

Every use of a cultural material in the classroom should be explicitly connected to a specific learning objective. The purpose is educational enrichment, not exotic display. If a traditional weaving tool is brought into a basic technology class, the lesson should explicitly connect the tool to the curriculum concepts being taught mechanisms, energy, materials rather than treating it as a cultural curiosity.

- Always seek permission from community cultural authorities before using cultural materials.
- Involve community experts in the contextualization and explanation of cultural materials.
- Distinguish between educational and ceremonial uses of cultural objects.
- Acknowledge Nigeria's cultural diversity; avoid monolithic representations.
- Connect every cultural material to explicit learning objectives.

Self-Assessment Exercise(s)

1. Why is it important to seek community permission before using cultural artefacts in a classroom setting?

2. Explain why it is potentially problematic to use ceremonial cultural objects as classroom display items.

3. How can a teacher avoid the trap of cultural stereotyping when using cultural materials from specific Nigerian ethnic groups in a multi-ethnic classroom?

4.0 Conclusion

This unit has examined the role of cultural, community, and human-made materials as valuable instructional resources. You have explored various categories of these materials, understood their educational significance, and learned strategies for their respectful integration.

It is important to recognize that using cultural materials is not merely a teaching technique; it reflects an educational philosophy that values diverse knowledge systems and promotes inclusive learning.

5.0 Summary

In this unit, you have learnt that cultural and community materials encompass traditional artefacts, ceremonial objects, oral literature, traditional knowledge, and contemporary resources.

These materials enhance learning by making abstract concepts concrete, affirming cultural identity, preserving indigenous knowledge, and fostering critical cultural literacy.

You have also learnt that effective use of these materials requires respect for cultural values, collaboration with community members, and alignment with instructional objectives. Oral literature, in particular, stands out as a versatile and accessible educational resource across Nigerian communities.

6.0 Tutor-Marked Assignment (TMA)

1. Identify and describe five categories of cultural and community materials used in Nigerian schools
2. Discuss the educational significance of cultural materials across cognitive, affective, cultural, and social dimensions

3. Explain strategies for integrating cultural materials respectfully into classroom instruction
4. Design a lesson plan using traditional craft artefacts for teaching basic technology or vocational education
5. Analyse how oral literature can enhance language arts and social studies teaching with examples

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Unit 3

Waste and Recycled Materials as Instructional Resources

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3.3 Waste Material Use and Environmental Education

4.0 Conclusion

5.0 Summary

6.0 Tutor-Marked Assignment (TMA)

7.0 References/Further Reading

1.0 Introduction

Let us consider a reality common to many educational settings in Nigeria—limited resources but abundant creativity. This unit explores how waste and recycled materials can be transformed into powerful instructional resources. Rather than viewing discarded items as useless, the innovative

educator recognizes their pedagogical potential. An empty bottle becomes a chemistry apparatus; old newspapers become literacy tools; worn tyres become agricultural containers.

At this point, it is important to note that the use of waste materials in education aligns strongly with principles promoted by UNESCO, particularly in fostering sustainable development and resource efficiency. Additionally, this approach resonates with experiential learning ideas embedded in Edgar Dale's framework, which emphasizes learning through direct, hands-on experiences.

This unit, adapted from the provided course material , examines categories of waste materials, their curriculum applications, and their role in environmental education within Nigerian school contexts.

2.0 Learning Outcomes

At the end of studying this unit, you should be able to:

1. Identify categories of waste and recycled materials available in Nigerian communities that can be used as instructional resources.
2. Describe specific applications of waste and recycled materials as instructional resources across different curriculum subjects.
3. Explain how the use of waste materials in education can support environmental education and sustainable development values.

3.0 Main Content

3.1 Categories of Waste and Recycled Materials for Educational Use

The Nigerian environment produces a wide variety of waste materials that can be repurposed for instructional use. The first step in utilizing these materials is to identify, sort, and prepare them safely.

Paper and Cardboard Waste:

Old newspapers, magazines, cardboard boxes, packaging materials, and waste paper are among the most versatile and abundant waste materials available in any Nigerian community. They can be used as: papier-mâché material for model construction; display surface materials for charts and posters; collage elements for art and design; origami and paper folding for geometry and design; and reading material for literacy activities (old newspapers provide authentic texts for comprehension, vocabulary, and media literacy work).

Plastic Waste:

Plastic bottles, containers, bags, bottle caps, and packaging materials are among the most abundantly available waste materials in Nigerian communities. Educational applications include: plastic bottles cut in half as laboratory containers; bottle caps as counting manipulatives; transparent plastic sheets as overlay transparencies; plastic tubing for fluid dynamics demonstrations; and plastic bottles as rain gauge or wind speed measurement instruments.

Metal Waste:

Tin cans, wire, bottle caps, metal offcuts, and discarded mechanical parts have applications in: model construction (particularly for working mechanical models); electrical circuit demonstrations (wire, tin foil as conductors); and creative arts and sculpture.

Organic Waste:

Agricultural waste materials corn cobs, groundnut shells, palm fronds, dried seed pods, coconut shells, bamboo offcuts are abundant in Nigerian farming communities and have applications in model construction, craft education, and as counting and sorting manipulatives. Organic waste materials are particularly culturally familiar and contextually relevant.

Textile and Cloth Waste:

Scraps of fabric, old clothing, and cloth offcuts from tailoring workshops can be used for: flannel board construction; puppet making; illustrating textile properties (weave structure, fiber types); and art and design projects.

Safety Considerations for Waste Materials:

- Wash and thoroughly dry all waste materials before use in the classroom.
- Remove sharp edges from metal and glass waste; do not use broken glass.
- Avoid using waste materials that have contained hazardous chemicals.
- Ensure that waste materials do not harbor disease vectors (mosquito larvae in water, mould, or rodent waste).
- Teach learners that waste material use in education is a deliberate, controlled activity not permission to bring any waste from home.

Self-Assessment Exercise(s)

1. List five categories of waste and recycled materials available in Nigerian communities and give two educational applications for each.

2. What safety considerations must be observed when using waste materials as instructional resources? Give four specific safety rules.

3. Explain how newspapers can support language learning in a secondary school classroom

3.2 Curriculum Applications of Waste and Recycled Materials

Waste materials can be integrated across virtually all subject areas, making learning more practical and engaging.

Science Applications:

Improvised laboratory equipment: Plastic bottles as graduated cylinders and reaction vessels; tin cans as heat sources or calorimeters; wire as electrical conductors; aluminum foil as electrodes; straws as air-bubble generators for investigating gas production in photosynthesis; rubber bands as tension springs for force measurement.

Model construction: Cardboard and paper for cell models; papier-mâché for anatomical models; plastic bottles for water cycle demonstrations; bottle caps for molecule models.

Mathematics Applications:

Counting and arithmetic: Bottle caps, seeds, dried beans, and corn kernels as counting objects; sets of identical objects for teaching multiplication and division.

Geometry: Cardboard cut into geometric shapes; matchsticks or toothpicks for constructing two- and three-dimensional geometric figures; circles cut from card for circle theorems.

Data handling: Old price tags, packaging labels, and newspaper advertisement data for statistical investigations.

Language Arts Applications:

Reading and comprehension: Old newspaper articles for comprehension, summary, and critical reading activities; magazine photographs for descriptive writing stimuli.

Writing: Recycled paper for first-draft writing practice (reducing the pressure of writing on 'good' paper); old envelopes for letter writing practice.

Language games: Letter tiles cut from card for spelling and vocabulary games; word cards for grammar activities.

Social Studies and Geography Applications:

Model making: Cardboard boxes for building models of settlements, markets, and geographic features; cut wire for mapping exercises; papier-mâché for relief models.

Economic studies: Packaging labels from locally purchased goods for studying prices, production locations, ingredients, and trade patterns.

Cultural and Creative Arts Applications:

Sculpture and mixed media art: Assemblage art using collected waste materials is a legitimate and internationally recognized art form. Nigerian artists such as El Anatsui have achieved world recognition through work created from waste materials. Learners can be introduced to this tradition through practical assemblage projects.

Mask making: Cardboard and newspaper can be used to produce sculptural masks exploring traditional Nigerian masquerade aesthetics.

Textiles: Strips of plastic bags can be woven, plaited, or knotted to produce functional textile items, combining craft skills with environmental messaging.

Self-Assessment Exercise(s)

1. Give three specific examples of how waste and recycled materials can be used as improvised laboratory equipment in secondary school science.
2. How can packaging labels from locally purchased goods be used as resources for teaching economic and geographical concepts?
3. Describe a secondary school cultural and creative arts project that uses waste materials as the primary medium, connecting the project to Nigerian artistic traditions.

3.3 Waste Material Use and Environmental Education

The use of waste and recycled materials in educational material production is not only a practical strategy it is an embodiment of the values of environmental stewardship, sustainable development, and responsible resource use that Nigerian schools are mandated to promote. Every lesson in which learners produce instructional materials from waste is simultaneously a lesson in environmental education.

The Three Rs in Educational Practice; Reduce, Reuse, Recycle:

The principles of Reduce, Reuse, and Recycle (the three Rs of environmental management) are directly embodied in the practice of using waste materials as instructional resources. Reduce: by using waste materials instead of purchasing new ones, schools reduce the demand for manufactured goods and the associated resource extraction and energy use. Reuse: by giving discarded items a new function as educational resources, schools practice the reuse principle

directly. Recycle: by transforming waste materials into new products (models, charts, games), schools demonstrate the creative possibilities of recycling.

Waste Audit as an Environmental Education Activity:

A school waste audit in which learners systematically collect, sort, weigh, and analyze the waste generated by the school over a period of one week is a powerful environmental education activity that simultaneously produces a practical inventory of available waste materials. Learners gain quantitative data about waste generation, develop analytical skills, and may identify specific waste materials available for use in instructional material production.

Community Environmental Action Projects:

The production of instructional materials from waste can be extended into broader community environmental action projects. Learners who have learned to see the educational value in waste are well-positioned to design and implement community awareness campaigns about waste management and recycling creating posters, pamphlets, and displays from recycled materials as part of the campaign. This connects the course to the service-learning principles discussed in Module 3.

Connecting to Nigeria's Environmental Policy Framework:

Nigeria's National Environmental Policy and various state environmental management laws mandate the promotion of waste reduction and sustainable resource use. Schools that actively incorporate waste material use into their educational practice are contributing to national environmental policy goals and providing learners with a concrete example of sustainable development in action.

Limitations and Cautions:

While the educational and environmental benefits of using waste materials are clear, it is important to avoid a romanticization of waste-based education that obscures legitimate needs for proper educational equipment. Improvised materials from waste are valuable supplements and creative alternatives but they do not replace the need for school investment in proper laboratory equipment, textbooks, and other educational infrastructure. Advocacy for adequate educational resourcing must accompany the practice of creative improvisation.

Self-Assessment Exercise(s)

1. Explain how the use of waste materials in educational resource production embodies the three Rs of environmental management.

2. Describe how a school waste audit can serve as an environmental education activity. What would learners learn from this activity?

3. Design a community environmental awareness campaign in which secondary school learners use recycled materials to produce all campaign materials. Describe the campaign objectives, materials, and activities.

4.0 Conclusion

This unit has demonstrated that waste and recycled materials are not merely substitutes for conventional resources but powerful tools for enhancing teaching and learning. They support cost-effective education, encourage creativity, and promote environmental responsibility. When

effectively utilized, they transform the immediate environment into a rich source of instructional materials.

5.0 Summary

In this unit, you have learnt that waste materials such as paper, plastic, metal, organic, and textile items can be effectively used as instructional resources. You have also seen that safety considerations are essential in their use. These materials support teaching across multiple subjects, including science, mathematics, language arts, and social studies. Furthermore, their use reinforces environmental education through the principles of Reduce, Reuse, and Recycle. Importantly, while valuable, such improvisation should complement—not replace—the provision of adequate educational resources.

6.0 Tutor-Marked Assignment (TMA)

1. Identify five categories of waste materials available in Nigerian school communities and give two curriculum applications for each.
2. Describe how plastic bottles can be used to produce at least three different pieces of improvised science equipment. Specify the equipment, the science concept illustrated, and any safety considerations.
3. How can the practice of using waste materials in educational material production contribute to environmental education in Nigerian schools?
4. Design a cross-subject unit of study in which Secondary 2 learners use waste and recycled materials to produce a complete set of instructional materials on the theme of water addressing science, geography, health, and language arts dimensions of the topic.

5. Explain the tension between advocating for the creative use of waste materials in education and advocating for adequate educational funding and resources. How should this tension be managed?

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Module 9

Mini-Project Techniques in Educational Technology

Unit 1:	Introduction to Mini-Project Techniques
Unit 2:	Needs Analysis and Project Design
Unit 3:	Mini-Project Production, Documentation, and Presentation

Unit 1

Introduction to Mini-Project Techniques

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3.1 Mini-Project Techniques: Concept and Educational Rationale

3.2 Structure and Requirements of the EDT 301 Mini-Project

3.3 Planning and Managing Your Mini-Project

4.0 Conclusion

5.0 Summary

6.0 Tutor-Marked Assignment (TMA)

7.0 References/Further Reading

1.0 Introduction

Welcome to Module 9. In this unit, you will be introduced to one of the most practical and distinctive components of EDT 301—the mini-project. Unlike traditional academic assignments that primarily test what you know, the mini-project challenges you to demonstrate what you can

do. It requires you to design, produce, and present a complete, low-cost instructional package that responds to a real educational need within a school or community context.

Let us consider the broader significance of this approach. The mini-project is grounded in project-based learning, a pedagogical strategy strongly promoted by organizations such as UNESCO for its effectiveness in developing real-world competencies. When you engage in such a project, you are not only applying theoretical knowledge but also building essential professional skills such as planning, creativity, problem-solving, and reflective thinking.

At this point, it is important to note that this unit will guide you through three key areas: the concept and rationale of mini-project techniques, the structure and requirements of the EDT 301 mini-project, and practical strategies for planning and managing your project effectively.

2.0 Learning Outcomes

At the end of studying this unit, you should be able to:

- i. Define mini-project techniques within the context of educational technology training.
- ii. Explain the educational rationale for using mini-project techniques.
- iii. Describe the structure and requirements of the EDT 301 mini-project.
- iv. Develop a systematic plan for executing a mini-project using appropriate planning tools.

3.0 Main Content

3.1 Mini-Project Techniques: Concept and Educational Rationale

A mini-project in educational technology is a small-scale, time-bound practical assignment in which you design, produce, and evaluate an original educational product. This may take the form

of instructional materials, a lesson plan integrating specific resources, or a complete instructional package.

Unlike large research projects, mini-projects focus more on practical production than theoretical exploration. The term “technique” refers to the structured methods you employ in planning, executing, and presenting your work. These methods are derived from instructional design principles, including models such as the ASSURE model, and are supported by practical production skills.

Educational Rationale for Mini-Project Techniques:

Problem-Based Learning: The mini-project requires students to engage with a real educational problem a specific learning need in a specific context and design a practical solution. This grounding in real-world problems makes learning relevant, motivating, and directly transferable to professional practice.

Integration of Knowledge and Skills: A well-executed mini-project requires the student to integrate knowledge from across the entire EDT 301 course understanding of learning theory, resource classification, design principles, ASSURE model steps, improvisation skills, and community resource knowledge in a single practical application.

Development of Professional Competency: The experience of planning, producing, presenting, and defending an original educational product before an audience mirrors key professional responsibilities of an educational technologist in a school or media production context. It builds the practical confidence and competency that academic knowledge alone cannot provide.

Formative Assessment Value: The mini-project process including planning documents, progress reviews, draft materials, and the final presentation provides multiple opportunities for formative feedback that supports learning throughout the project cycle, not only at its conclusion.

Types of Mini-Projects in EDT 301:

- **Instructional Package:** A complete set of instructional materials (charts, models, activity cards, assessment instruments) designed for a specific curriculum topic and learner population.
- **Improvised Materials Collection:** A set of improvised instructional materials produced from locally available resources, with documentation of the design rationale, production process, and instructional applications.
- **Community Resource Engagement Plan:** A comprehensive plan for mobilizing specific community resources for use in a school's curriculum, including a resource inventory, engagement plan, and sample lesson plans.
- **Resource-Based Lesson Series:** A series of three to five connected lesson plans that systematically integrate community or improvised instructional resources, developed and demonstrated using the ASSURE framework.

Self-Assessment Exercise(s)

1. Define mini-project techniques in the context of educational technology training. How does a mini-project differ from a conventional academic essay or report?

2. Explain four educational rationales for using mini-project techniques in EDT 301.

3. Describe four types of mini-projects that students might undertake in EDT 301.

3.2 Structure and Requirements of the EDT 301 Mini-Project

A complete EDT 301 mini-project consists of several interconnected components, each contributing to the overall quality and coherence of the work.

Component 1: Project Proposal (Week 1–2):

The project proposal is a brief document (1–2 pages) in which the student identifies the educational problem or need to be addressed, describes the target learner population, states the overall project objective, outlines the planned approach and materials, and identifies the community resources and locally available materials to be used. The proposal is submitted to the course tutor for approval before production work begins.

Component 2: Learner and Context Analysis (Week 2–3):

Drawing on the 'Analyze Learners' step of the ASSURE model, the student produces a written learner profile that describes the characteristics of the target learner population general characteristics, specific entry competencies, learning style considerations, linguistic background, and contextual factors. This analysis informs all subsequent design and production decisions.

Component 3: Instructional Objectives (Week 3):

The student states three to five specific, measurable instructional objectives for the project, written using the ABCD format and referencing appropriate levels of Bloom's Taxonomy. These objectives guide the design of materials and the development of evaluation instruments.

Component 4: Materials Production (Week 3–8):

This is the core practical component of the project. The student designs and produces the instructional materials or package, guided by the design principles of Module 5, the ASSURE model, and the improvisation and locally available resource skills of Modules 7 and 8. All

materials must be original, locally produced, and appropriately adapted to the target learner population.

Component 5: Lesson Plan(s) (Week 6–8):

The student develops one or more complete lesson plans demonstrating how the produced materials will be used in an actual teaching situation. The lesson plans follow the full ASSURE framework and include all six steps.

Component 6: Self-Evaluation Report (Week 8–9):

After completing materials production, the student writes a self-evaluation report assessing the quality of the produced materials against the principles covered in the course, identifying specific strengths, limitations, and areas for revision, and documenting lessons learned from the production process.

Component 7: Project Presentation and Defense (Week 9–10):

The student presents the completed project to the class and tutor, demonstrating the produced materials, explaining the design rationale, and responding to questions and feedback from the audience. This presentation simulates the professional context in which educational technologists must explain and justify their design decisions to school administrators, curriculum planners, and community stakeholders.

Self-Assessment Exercise(s)

- | |
|--|
| 1. Describe the seven components of a complete EDT 301 mini-project. |
| 2. Why is the project proposal submitted for tutor approval before production work begins? |

3. What is the purpose of the self-evaluation report? How does it contribute to the student's professional development?

3.3 Planning and Managing Your Mini-Project

Effective project management is a key competency in educational technology and a critical determinant of mini-project success. Many students begin their mini-projects with great enthusiasm but struggle with time management, scope creep, and production quality when they fail to plan systematically from the outset.

Project Planning Tools:

Gantt Chart: A Gantt chart is a visual timeline showing the planned activities of the project, their durations, and their sequencing. It is one of the most useful planning tools for a time-limited project. For an EDT 301 mini-project with a 10-week timeline, a Gantt chart would list all major activities (proposal writing, learner analysis, materials production, lesson plan development, self-evaluation, presentation preparation) in the left column, and show the planned weeks for each activity as horizontal bars across the chart.

Work Breakdown Structure (WBS): A WBS decomposes the overall project into smaller, manageable tasks and sub-tasks. For a mini-project, this might involve breaking down 'materials production' into: designing the chart layout; gathering materials; producing the base chart; adding color and illustrations; adding text; laminating; testing with peers; and revising. A detailed WBS helps prevent important tasks from being overlooked.

Resource Inventory: Before beginning production, prepare a list of all materials needed for the project, identifying which are already available, which must be sourced from the community, and

which must be purchased. This inventory prevents production delays caused by missing materials.

Managing Common Mini-Project Challenges:

Scope creep the tendency to keep adding new elements to a project beyond the original plan is one of the most common problems in mini-project management. To avoid scope creep: write a clear, specific project scope statement at the outset; review it regularly throughout the project; and resist the temptation to add new materials or objectives unless the original ones have been adequately addressed.

Time management: Mini-projects consistently take longer than students estimate. Build buffer time into your Gantt chart; begin materials production as early as possible; and submit draft materials to your tutor for feedback well before the final presentation.

- Write a clear project proposal and get tutor approval before beginning.
- Develop a Gantt chart showing the timeline for all major activities.
- Prepare a detailed work breakdown structure and materials inventory.
- Begin production early and seek tutor feedback at interim stages.
- Keep the project scope focused quality of a few well-designed materials is better than quantity of poorly designed ones.
- Document your design decisions and production process from the beginning for use in the self-evaluation report.

Self-Assessment Exercise(s)

1. What is a Gantt chart? Design a simple Gantt chart for a 10-week EDT 301 mini-project.

2. What is scope creep? How can it be prevented in a mini-project?

3. What does a project resource inventory contain? Why is it important to prepare this inventory before beginning materials production?

4.0 Conclusion

In this unit, you have been introduced to mini-project techniques as a central element of practical learning in EDT 301. You have explored the concept and educational rationale of mini-projects, examined their structure and requirements, and learned how to plan and manage them effectively using appropriate tools. These foundational insights will guide you as you proceed to subsequent units focusing on needs analysis, production, and presentation.

5.0 Summary

In this unit, you have learnt that a mini-project is a practical, time-limited assignment that involves designing, producing, and evaluating instructional materials. You have also understood that mini-projects are grounded in problem-based learning, support the integration of knowledge and skills, and promote professional competency development.

Furthermore, you have examined the seven key components of the EDT 301 mini-project, including proposal development, learner analysis, objective formulation, materials production, lesson planning, self-evaluation, and presentation. Finally, you have learned that effective project

management relies on tools such as Gantt charts, Work Breakdown Structures, and resource inventories, as well as strategies for managing time and controlling project scope.

6.0 Tutor-Marked Assignment (TMA)

1. Define mini-project techniques and explain their educational rationale in the context of EDT 301.
2. Describe the seven components of an EDT 301 mini-project and explain the purpose of each.
3. Develop a Gantt chart for a 10-week EDT 301 mini-project of your choice, showing all major activities and their planned durations.
4. What is a work breakdown structure? Produce a WBS for the materials production component of an EDT 301 mini-project.
5. Discuss the main challenges students commonly face in mini-project management and suggest practical strategies for overcoming each.

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Unit 2

Needs Analysis and Project Design

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6.0 Tutor-Marked Assignment (TMA)

7.0 References/Further Reading

1.0 Introduction

In Unit 1, you were introduced to the concept and structure of the EDT 301 mini-project and learned how to plan and manage it effectively. At this point, it is important to move into the first critical analytical stage of project execution—needs analysis and project design.

Before any instructional material is produced—whether charts, models, or digital resources—you must first establish a clear, evidence-based understanding of the educational problem your project intends to solve. Let us consider this carefully: instructional materials that are visually appealing but fail to address actual learner needs are ultimately ineffective. This is why needs analysis is central to instructional design practice, as emphasized in global frameworks supported by organizations such as UNESCO.

Needs analysis involves systematically collecting and interpreting information about learners, their context, and their learning challenges. It enables you to identify the gap between current performance and expected performance, ensuring that your project is purposeful, relevant, and impactful.

This unit will guide you step-by-step through conducting a needs analysis and translating your findings into a structured project design brief that will serve as a roadmap for your mini-project.

2.0 Learning Outcomes

At the end of studying this unit, you should be able to:

- i. Define and conduct a systematic needs analysis within an educational context
- ii. Analyse learner data to identify performance gaps and instructional needs
- iii. Interpret needs analysis findings to design an appropriate instructional intervention
- iv. Develop a comprehensive project design brief for an educational mini-project
- v. Evaluate and select an appropriate project focus and scope based on defined criteria

3.0 Main Content

3.1 The Needs Analysis Process

Needs analysis—sometimes referred to as front-end analysis or instructional needs assessment—is a systematic process used to gather data about the current educational situation and compare it with the desired learning outcomes.

Sources of Needs Analysis Data:

Learner performance data: Examination results, class test scores, teacher assessments, and observation of learner performance can identify specific areas of difficulty or underachievement that represent genuine learning needs.

Teacher and stakeholder input: Discussions with the class teacher, subject head, school administrators, parents, and community members can surface perceived needs, curriculum challenges, and contextual factors that are not visible in performance data alone.

Curriculum analysis: Reviewing the relevant curriculum documents, scheme of work, and past examination papers can identify topics that are consistently challenging for learners, that are poorly supported by existing materials, or that have particular relevance to the local community and environment.

Learner surveys and focus groups: Direct consultation with learners through questionnaires, informal discussions, or focus group conversations provides insight into learners' own perceived difficulties, learning preferences, and motivational patterns.

The Performance Gap Framework:

A useful framework for organizing needs analysis findings is the performance gap model: Current Performance (What can learners currently do or understand in relation to this topic?) versus Desired Performance (What should learners be able to do or understand according to the

curriculum and learning objectives?). The gap between current and desired performance defines the specific instructional need.

Conducting a Mini-Project Needs Analysis:

For an EDT 301 mini-project, the needs analysis need not be exhaustive or lengthy. A focused, practical needs analysis for a mini-project might involve: reviewing the scheme of work and relevant curriculum documents (30 minutes); discussing the topic with the class teacher or subject specialist (30–60 minutes); administering a brief diagnostic questionnaire or pre-test to the target learner group (15–20 minutes); and synthesizing findings into a brief written summary identifying the specific learning need to be addressed.

Self-Assessment Exercise(s)

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| 1. Define needs analysis in the context of instructional design. What is the performance gap it seeks to identify? |
| 2. List four sources of needs analysis data that an EDT 301 student could use when conducting a mini-project needs analysis. |
| 3. Design a brief diagnostic questionnaire (5–7 questions) that could be used to assess learner entry competencies before teaching a unit on Nigeria's physical geography. |

3.2 Translating Analysis Findings into a Project Design Brief

Once your needs analysis is complete, the next step is to translate your findings into a **project design brief**. This document serves as a structured guide that defines what your project will achieve, for whom, and how.

Components of a Mini-Project Design Brief:

Project Title: A clear, descriptive title that identifies the subject, topic, and target learner group (e.g., 'Improvised Instructional Package for Teaching Photosynthesis to JSS 2 Biology Learners in a Rural Public School').

Identified Educational Need: A concise statement of the specific learning need identified through the needs analysis, with brief supporting evidence.

Target Learner Profile: A summary of the key learner characteristics identified in the analysis, including class level, age range, linguistic background, relevant prior knowledge, and contextual factors.

Instructional Objectives: Three to five specific, measurable objectives written in ABCD format, covering appropriate levels of Bloom's Taxonomy.

Proposed Materials and Resources: A list of the specific instructional materials to be produced, with a brief description of each, and an identification of the locally available resources to be used in production.

Instructional Methods: A brief description of how the produced materials will be used in instruction the instructional methods to be employed and the mode of learner participation planned.

Evaluation Plan: A brief description of how the effectiveness of the materials will be evaluated what evidence will be gathered, from whom, and using what instruments.

Timeline: A summary of the planned timeline for each component of the project.

Sample Design Brief Statement:

The following is an example of how the 'Identified Educational Need' component might be written: 'Needs analysis data collected through teacher consultation and a brief diagnostic test administered to 38 JSS 2 learners at Government Secondary School, Bida indicate that 72% of learners are unable to correctly explain the process of photosynthesis or identify its inputs and outputs. Teacher reports suggest that the existing textbook diagrams are too small and poorly labeled for effective classroom use. The school has no laboratory materials relevant to this topic. This project will produce a set of improvised instructional materials including a large-format illustrated chart, a model leaf cross-section, and a set of activity cards designed to address these identified gaps.'

Self-Assessment Exercise(s)

- | |
|---|
| 1. List and describe the components of a mini-project design brief. |
| 2. Write a complete 'Identified Educational Need' statement for an EDT 301 mini-project of your choice, modeled on the example provided. |
| 3. How does the project design brief function as a guiding reference during materials production? Why is it important not to deviate from the design brief without justification? |

3.3 Selecting the Project Focus and Scope

One of the most critical decisions in mini-project design is determining the appropriate focus and scope. A well-defined scope ensures that the project is both achievable and meaningful.

Criteria for Selecting a Good Mini-Project Focus:

Genuine need: The project should address a real, documented educational need not a topic you personally find interesting but learners have no difficulty with.

Local resource availability: The project should be feasible with the locally available, low-cost resources accessible to you. Avoid designing projects that depend on materials or equipment that you cannot realistically obtain.

Curriculum alignment: The project should address a specific topic in the official Nigerian secondary school curriculum (or primary school curriculum, for students targeting primary education).

Achievable scope: A well-focused mini-project addressing one curriculum topic deeply with two or three high-quality, well-designed materials is far more impressive and educationally valuable than a broad project attempting to address an entire subject area with many superficially produced materials.

Personal interest and strengths: Within the constraint of genuine need, choose a focus that draws on your personal subject knowledge strengths and craft skills. A student with strong drawing skills might produce outstanding hand-drawn charts; one with craft skills might produce exceptional three-dimensional models.

Common Scope Errors to Avoid:

- Too broad: 'Materials for teaching all of JSS 3 biology' this is a semester-long program, not a mini-project.
- Too narrow: 'A single flash card for teaching one vocabulary word' this does not demonstrate sufficient design complexity.
- Misaligned with need: 'A digital presentation on the water cycle for a school without electricity' the medium does not match the context.
- Unrealistic production ambitions: 'A fully animated computer simulation of the human nervous system' beyond the scope of improvised local production.
- Correct scope: 'An improvised instructional package (chart, model, and activity cards) for teaching the nitrogen cycle to SS 1 biology learners in Government Secondary School, Minna.'

Self-Assessment Exercise(s)

1. List five criteria for selecting a well-focused mini-project topic and explain each.

2. Identify the scope errors in the following mini-project descriptions and explain how each should be corrected: (a) 'Instructional materials for all of secondary school geography'; (b) 'One poster about malaria for a fully equipped urban private school'.

3. Develop a well-scoped mini-project design brief for a topic of your choice in any secondary school subject, applying all the criteria discussed in this section.

4.0 Conclusion

This unit has provided a comprehensive exploration of needs analysis and project design as foundational stages in instructional development. You have learned how to systematically gather data, identify performance gaps, and translate findings into a structured design brief.

At this point, it is clear that effective instructional materials do not begin with production but with careful analysis and planning. By selecting a focused and feasible project scope, you position yourself to create meaningful and impactful educational resources.

5.0 Summary

In this unit, you have learned that needs analysis is essential for identifying the gap between current and desired learner performance. You explored multiple sources of data, including learner performance records, stakeholder input, curriculum analysis, and learner feedback.

You also learned that a project design brief serves as a structured guide for instructional development, ensuring alignment between identified needs and instructional solutions. Finally, you examined how to select a project focus that is realistic, relevant, and achievable within available resources.

6.0 Tutor-Marked Assignment (TMA)

1. Define needs analysis. What is a performance gap and why is it the central concept of needs analysis?

2. Describe four sources of data that can be used in a mini-project needs analysis and explain the specific information each source can provide.
3. Develop a complete project design brief for an EDT 301 mini-project in a subject area of your choice.
4. Evaluate the following mini-project focus for scope appropriateness: 'Developing a complete set of instructional materials for teaching the entire primary school social studies curriculum.' What adjustments would you recommend?
5. Explain how the 'Analyze Learners' step of the ASSURE model informs the learner profile component of a mini-project design brief.

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Unit 3

Mini-Project Production, Documentation, and Presentation

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6.0 Tutor-Marked Assignment (TMA)

7.0 References/Further Reading

1.0 Introduction

At this stage of your mini-project journey, you have successfully completed the critical planning components—your proposal, learner analysis, instructional objectives, and design brief. Let us now move into the final and equally important phases: production, documentation, and presentation.

It is important to note that many learners devote significant effort to planning but tend to rush through production and documentation. As a result, the final materials may not reflect their true capabilities. Conversely, some produce excellent materials but fail to present them effectively, thereby limiting the impact of their work.

This unit provides a structured and systematic guide to help you avoid these pitfalls. Drawing from best practices in instructional design and recommendations from organizations such as UNESCO, you will learn how to ensure quality production, develop a comprehensive project portfolio, and deliver a professional presentation.

By the end of this unit, you will be fully prepared to produce, document, and present a high-quality EDT 301 mini-project that demonstrates both competence and creativity.

2.0 Learning Outcomes

At the end of studying this unit, you should be able to:

1. Apply systematic production techniques to produce high-quality instructional materials for the EDT 301 mini-project.
2. Document the mini-project production process comprehensively for inclusion in the project portfolio.
3. Plan and deliver an effective mini-project presentation and defense.

3.0 Main Content

3.1 Materials Production: Quality Assurance and Peer Review

The production phase represents the transformation of your ideas into tangible instructional materials. At this point, all the theoretical knowledge and design planning come to life. Therefore, careful attention to quality is essential.

Production Quality Checklist:

Before finalizing any produced material, evaluate it against the following quality checklist derived from the principles and design guidelines covered in Modules 5, 6, 7, and 8:

- **Instructional validity:** Does the material accurately represent the concept it teaches? Has the content been verified against reliable sources?
- **Objective alignment:** Does the material directly support one or more of the stated project objectives? Could you explain precisely how?
- **Learner appropriateness:** Is the material appropriate for the age, language level, and cultural background of the target learner group?
- **Clarity and simplicity:** Is the main message or concept communicated clearly, without unnecessary complexity or clutter?
- **Visibility and legibility:** Can all text be read clearly from the expected viewing distance? Are all images sufficiently large and clear?
- **Accuracy of design principles:** Has the material been designed using the message design and visual communication principles from Module 5?
- **Durability and safety:** Is the material constructed to withstand repeated use? Are there any safety concerns?
- **Aesthetic quality:** Is the material as neat, attractive, and well-finished as possible given the available materials and time?

Peer Review Process:

Before finalizing materials, organize a peer review session in which two or three fellow students examine each material and provide structured feedback. Use the quality checklist above as the review framework. Peer review catches errors and weaknesses that the producer who is too close to the material may not notice. It also provides an opportunity to practice the verbal defense of design decisions that will be required in the final presentation.

Pilot Testing:

Where possible, pilot test your materials with a small group of learners from the target population before finalizing them. Even an informal pilot asking three or four learners to interact with a material and tell you what they understand from it can reveal significant problems with clarity, language level, or content accuracy that classroom use would expose in a much more costly way.

Self-Assessment Exercise(s)

1. Using the production quality checklist provided, evaluate a chart or poster you have produced during this course. Identify two specific strengths and two specific areas for improvement.

2. What is a peer review in the context of mini-project production? How should a peer review session be organized?

3. What is pilot testing of instructional materials? Describe how you would conduct a simple pilot test of a set of flash cards with a small group of learners.

3.2 Documenting the Mini-Project: The Project Portfolio

Documentation is a critical aspect of your mini-project because it provides evidence of your thinking process, design decisions, and professional competence. The project portfolio is not merely a collection of documents; it is a structured narrative of your entire project journey.

Components of the Project Portfolio:

The portfolio should include the following sections, each clearly labeled:

Section 1: Project Proposal (as submitted and approved)

Section 2: Needs Analysis Summary: A 1–2-page summary of the needs analysis findings, including the methods used, the key findings, and the identified performance gap.

Section 3; Learner Profile: The written learner analysis, following the ASSURE 'Analyze Learners' format.

Section 4: Instructional Objectives: The final, approved set of objectives in ABCD format.

Section 5: Design Brief: The complete project design brief.

Section 6: Materials Design Documentation: For each produced material, a one-page design rationale explaining: what the material is; which objective(s) it supports; what design decisions were made and why (choice of format, color, layout, language level, etc.); what materials were used in production and why these were selected; and how the material reflects the principles of improvisation and locally available resource use.

Section 7: Lesson Plan(s): The complete ASSURE-framework lesson plan(s) showing how the materials will be used in instruction.

Section 8: Self-Evaluation Report: A 2–3-page reflective report evaluating the overall project the strengths and limitations of the produced materials, specific design decisions that worked well and those that would be revised, and lessons learned about the instructional design and improvisation process.

Section 9: References: A properly formatted list of all sources consulted during the project.

Documentation of the Production Process:

Throughout the production phase, document your work visually and in writing. Take photographs of materials at different stages of production. Keep a brief production diary noting design decisions, problems encountered, and solutions found. This documentation provides authentic evidence of the production process and enriches the portfolio.

Self-Assessment Exercise(s)

1. List the nine sections of a complete EDT 301 project portfolio and describe the purpose of each.

2. What should a materials design rationale (Section 6 of the portfolio) contain? Write a sample design rationale for an improvised chart you have produced.

3. What is the purpose of the self-evaluation report? What should it cover? Write the opening paragraph of a self-evaluation report for a mini-project of your choice.

3.3 Planning and Delivering the Mini-Project Presentation

The presentation and defence of your mini-project provide an opportunity to showcase your work and demonstrate your understanding. It is both an assessment activity and a professional skill-building experience.

Planning the Presentation:

A 15–20-minute mini-project presentation typically follows this structure: Introduction (2 minutes): Briefly introduce yourself, state the project title, and give a one-sentence summary of the project's educational focus. Needs and Objectives (3 minutes): Summarize the educational need identified through your analysis and state your project objectives. Materials Demonstration (8–10 minutes): This is the heart of the presentation. Display and demonstrate each produced material. For each material: show it to the audience; explain its instructional purpose and which objective it supports; describe the key design decisions and their rationale; and demonstrate how it would be used in a lesson. Production Story (2 minutes): Briefly describe the improvisation and locally available resource approach used what materials were used, where they came from, and what challenges were encountered. Evaluation and Reflection (2 minutes): Share the key insights from your self-evaluation report what worked, what you would revise, and what you learned.

Demonstrating Materials Effectively:

The physical demonstration of your materials is the most important part of the presentation. Use these techniques: hold materials at face height so the audience can see clearly; point to specific features as you discuss them; speak directly to the audience rather than reading from notes; invite

a peer to interact with a material (e.g., sort the flash cards, complete the activity on the chart) to demonstrate its interactive use.

Responding to Questions and Feedback:

The question and feedback session following the presentation is an opportunity to demonstrate depth of thinking. Common questions include: 'Why did you choose this format rather than another?'; 'How would you adapt this material for a learner with a visual impairment?'; 'What evidence do you have that this material would actually improve learning?'; and 'What would you change if you could do this project again?' Prepare thoughtful, evidence-based answers to questions like these by reviewing your design rationale and self-evaluation report before the presentation.

Assessment Criteria for the Mini-Project:

- Quality and completeness of the project portfolio (40%): All required sections present; quality of needs analysis, objectives, design rationale, and self-evaluation.
- Quality of produced materials (40%): Instructional validity, design quality, use of local/improvised resources, durability, appropriateness for target learners.
- Quality of presentation and defense (20%): Clarity of communication, depth of design rationale, ability to respond to questions.

Self-Assessment Exercise(s)

1. Describe the recommended structure for a 15–20-minute EDT 301 mini-project presentation.

2. How should produce materials be demonstrated during a project presentation? What techniques make demonstrations effective?

3. Prepare five questions that you would expect to be asked during a mini-project defense. Write a model answer for each question.

4.0 Conclusion

In this unit, you have explored the final stages of the mini-project process: production, documentation, and presentation. Each stage plays a vital role in ensuring that your work is not only completed but also professionally executed and effectively communicated.

You are now equipped with the knowledge and skills required to produce high-quality instructional materials, document your design process comprehensively, and present your work with confidence.

5.0 Summary

In this unit, you have learnt that production quality is achieved through systematic evaluation, peer review, and pilot testing. You have also understood that a complete project portfolio consists of nine structured sections that document both the process and outcomes of your work.

Furthermore, you have examined how design rationale explains instructional decisions and how effective presentations communicate the value of your project. Finally, you have seen that assessment is based on portfolio quality, produced materials, and presentation performance.

6.0 Tutor-Marked Assignment (TMA)

1. Describe the production quality checklist for EDT 301 mini-project materials. How should peer review and pilot testing be incorporated into the production process?
2. Describe the nine sections of a complete project portfolio and explain the purpose of each.
3. What should a materials design rationale document contain? Write a complete design rationale for an improvised model you have produced.
4. Plan a 15-minute project presentation for an EDT 301 mini-project of your choice. Write a detailed outline showing the content and timing of each section.
5. What are the assessment criteria for the EDT 301 mini-project? How would you advise a student who wants to achieve the highest possible grade?

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Module 10

Utilization, Evaluation, and Sustainability of Instructional Packages

Unit 1:	Utilization of Instructional Packages in Classroom and Community Settings
Unit 2:	Evaluation of Instructional Materials and Packages
Unit 3:	Sustainability of Instructional Resource Programs in Schools and Communities

Unit 1

Utilization of Instructional Packages in Classroom and Community Settings

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3.2 Effective Classroom Utilization of Instructional Packages

3.3 Community-Based Utilization of Instructional Packages

4.0 Conclusion

5.0 Summary

6.0 Tutor-Marked Assignment (TMA)

7.0 References/Further Reading

1.0 Introduction

Welcome to Module 10, the final module of EDT 301. At this point in your learning journey, you have developed a strong foundation in instructional resource theory, design, production, and project management. Let us now move toward the practical application of these competencies.

This unit focuses on the effective utilization of instructional packages in both classroom and community settings. It is important to note that an instructional package is not merely a collection of materials; rather, it is an integrated system in which each component plays a deliberate role in achieving learning outcomes.

In line with global perspectives promoted by UNESCO, education should extend beyond formal classrooms into communities. Therefore, this unit will guide you in understanding how instructional packages can be used effectively across diverse learning environments.

2.0 Learning Outcomes

At the end of studying this unit, you should be able to:

- i. Define the concept of an instructional package and describe its components
- ii. Explain strategies for effectively utilizing instructional packages in classroom settings
- iii. Describe approaches to utilizing instructional packages in community-based learning settings

3.0 Main Content

3.1 The Concept of an Instructional Package

Let us consider what an instructional package truly represents. An instructional package is a systematically organized collection of instructional materials, activities, and support resources designed to achieve specific learning objectives for a defined group of learners.

At this point, it is important to emphasize that the idea of a “package” goes beyond simply assembling materials. It implies coherence and integration, where each component contributes meaningfully to the instructional goal.

Typical Components of an Instructional Package:

- Content materials: The primary instructional materials through which learners engage with the content charts, models, specimens, handouts, video clips, or readings.
- Learner activity materials: Worksheets, activity cards, games, puzzles, and project briefs that require learners to actively engage with the content.
- Assessment instruments: Pre-tests (for diagnosing entry knowledge), formative assessment activities (for monitoring progress during instruction), and post-tests or performance tasks (for evaluating achievement of objectives).
- Teacher guide: A document providing the teacher with background information on the topic, guidance on how to use each component of the package, suggested lesson plans or activity sequences, and tips for adapting the package for learners with different needs.
- Learner guide: Where appropriate, a learner guide provides learners with background information, study questions, and self-assessment activities that support independent or self-directed engagement with the package.
- Reference materials: Supplementary resources additional readings, specimen lists, community resource contacts that support deeper exploration of the topic.

The instructional package model has a long history in distance and open learning, where packages must be self-sufficient enough for learners to use with minimal direct teacher support.

In the context of EDT 301, instructional packages are designed primarily for use in face-to-face classroom settings but with the awareness that they may also need to serve learners in contexts where teacher support is limited.

Low-Cost Packaging:

Instructional packages produced from improvised and locally available materials can be housed in simple, durable containers: cardboard boxes, folders, envelopes, or locally made cloth bags. Labeling the container clearly with the package title, target class, subject, and a list of contents ensures that the package can be easily located, checked for completeness, and maintained over time.

Self-Assessment Exercise(s)

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|---|
| 1. Define an instructional package. How does it differ from a simple collection of instructional materials? |
| 2. List six typical components of an instructional package and describe the function of each. |
| 3. How can an improvised instructional package be physically housed and stored using locally available, low-cost materials? |

3.2 Effective Classroom Utilization of Instructional Packages

An instructional package achieves its purpose only when it is used effectively. Let us now examine how this can be done within a classroom setting.

Pre-Lesson Preparation:

Before the lesson, the teacher should: review the teacher guide and familiarize themselves with all package components; verify that all components are present and in good condition; prepare the classroom environment for the planned activities; administer the package pre-test (if included) to establish baseline knowledge; and brief learners on the topic and objectives.

Sequencing Package Components:

The components of an instructional package should be used in a deliberate sequence that builds understanding progressively. A typical sequence might be: content presentation (chart, model, or specimen to introduce the concept); guided practice (worksheet or activity cards for structured practice with teacher support); application activity (game, project, or discussion task for independent application); and assessment (post-test or performance task to evaluate achievement).

Managing Learner Interaction with Package Materials:

When learners interact directly with physical package materials (handling models, completing activity cards, using games), careful management is required. Establish clear routines for distributing and collecting materials; set behavioral expectations for handling fragile or complex items; organize learners into groups of appropriate size for the activity; monitor group activities actively; and ensure that all learners have equitable access to and interaction with the materials.

Adapting Package Use for Different Learners:

An instructional package designed for the typical class may need to be adapted for learners with specific needs. Learners with limited English proficiency may need additional visual support or use of the local language for key terms. Learners with visual impairments may need tactile

versions of display materials or verbal descriptions. High-achieving learners may benefit from extension activities or additional reference materials from the package.

Post-Lesson Follow-Up:

After using a package, the teacher should: collect and review completed learner activity materials to assess engagement and understanding; administer the package post-test and compare results with the pre-test to assess learning gains; return all package materials to their container and check for damage; record observations about the package's effectiveness for future reference.

Self-Assessment Exercise(s)

- | |
|--|
| 1. Describe the pre-lesson preparation steps required before using an instructional package in a classroom. |
| 2. What is the recommended sequence for using the components of an instructional package?
Explain the rationale for this sequence. |
| 3. How should a teacher manage a class of 45 students interacting with a physical instructional package (models and activity cards) during a science lesson? |

3.3 Community-Based Utilization of Instructional Packages

Education does not occur only within classroom walls. Let us now explore how instructional packages can be utilized in community-based contexts.

Characteristics of Community-Based Learning Contexts:

Community-based learning contexts differ from formal school settings in several important ways that affect how instructional packages should be designed and used: learners are typically adults or out-of-school youth with different motivational patterns and life experiences than school children; the physical setting may be informal (under a tree, in a community hall, in a market); time available for instruction may be limited and irregular; literacy levels among learners may be variable; and the facilitator may be a community volunteer or peer educator rather than a trained teacher.

Adapting Packages for Community Contexts:

Packages designed for use in community contexts should use visual materials extensively with minimal text dependence; embed content in locally relevant examples and contexts that resonate with adult learners' life experiences; use participatory facilitation methods that draw on learners' existing knowledge and experience; be physically robust and suitable for use in outdoor or low-infrastructure settings; and include simple, clear facilitation guides that can be used by facilitators with limited formal training.

Examples of Community-Based Package Utilization:

Health Education: A community health worker uses a package of illustrated flip charts, specimen jars of common disease vectors, and role-play scenario cards to deliver a malaria prevention session at a village health post. The flip charts use minimal text and culturally familiar imagery; the facilitator guide includes simple facilitation questions in Hausa, Yoruba, or Igbo as well as English.

Agricultural Extension: An extension officer uses a package of soil sample jars, improvised pH test strips (using hibiscus indicator), illustrated instruction cards, and a locally produced seed bank guide to lead a soil management workshop with a farmer group in a peri-urban setting.

Non-Formal Literacy: A community literacy facilitator uses a set of culturally relevant big books, letter tiles, and word cards all produced from card and local materials to lead a reading session with an adult literacy class meeting three evenings per week.

Self-Assessment Exercise(s)

1. Describe three key characteristics of community-based learning contexts that affect how instructional packages should be designed and used.

2. How should an instructional package designed for formal school use be adapted for use in a community adult education context?

3. Design a brief outline for a health education instructional package intended for use by community health workers in a rural Nigerian community, identifying the components and key design adaptations required.

4.0 Conclusion

In this unit, you have explored the concept of instructional packages as integrated systems designed to support effective teaching and learning. You have examined how these packages can be utilized in classroom settings through structured sequencing and active learner engagement.

You have also considered how instructional packages can be adapted for community-based learning, where flexibility, relevance, and accessibility are essential. This understanding prepares you for further work in evaluating and sustaining instructional resources.

5.0 Summary

In this unit, you have learnt that an instructional package is a coherent and integrated collection of materials designed to achieve specific learning objectives. You have understood that such packages include content materials, learner activities, assessment tools, and instructional guides.

You have also learnt that effective classroom utilization requires proper preparation, structured sequencing, active learner participation, and follow-up evaluation. Furthermore, you have explored how instructional packages can be adapted for community-based learning by emphasizing visual materials, local relevance, participatory methods, and durability.

6.0 Tutor-Marked Assignment (TMA)

1. Define the concept of an instructional package and list its typical components.
2. Describe the recommended sequence for utilizing the components of an instructional package in a 70-minute secondary school lesson.
3. How should an instructional package be managed when used with a large, diverse class of 45 learners?
4. Design a community-based instructional package on hand-washing and hygiene for use by community health volunteers in a peri-urban Nigerian community. Specify all components and key design adaptations.

5. Compare the classroom and community-based contexts for instructional package utilization. What are the three most important differences that affect package design and facilitation?

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Unit 2

Evaluation of Instructional Materials and Packages

Contents

1.0 Introduction

2.0 Learning Outcomes

3.0 Learning Contents

3.1 Types and Purposes of Evaluation

3.2 Evaluation Instruments for Instructional Materials

3.3 Interpreting Evaluation Findings and Revising Materials

4.0 Conclusion

5.0 Summary

6.0 Tutor-Marked Assignment (TMA)

7.0 References/Further Reading

1.0 Introduction

Evaluation is a systematic process of gathering evidence about the quality and effectiveness of instructional materials and packages, and using that evidence to improve them. Let us consider evaluation not merely as a final checkpoint, but as an essential component that closes the loop between instructional design intentions and actual learning outcomes. In this sense, evaluation

supports continuous improvement and ensures that instructional materials truly serve their intended purpose.

At this point, it is important to understand that in educational technology, evaluation is not a one-time activity carried out after instruction. Rather, it is an ongoing process that occurs at multiple stages: before materials are finalized (formative evaluation), during instruction (concurrent evaluation), and after instruction (summative evaluation).

A reflective educational technologist approaches evaluation not as criticism, but as a valuable learning tool—a structured way of identifying what works, what needs improvement, and why. This perspective aligns with global educational quality frameworks promoted by organizations such as UNESCO, which emphasize continuous improvement and evidence-based practice in teaching and learning.

This unit, therefore, provides a comprehensive understanding of evaluation approaches, instruments, and processes relevant to instructional materials and packages, particularly within the Nigerian educational context.

2.0 Learning Outcomes

At the end of studying this unit, you should be able to:

1. Distinguish between formative, concurrent, and summative evaluation of instructional materials.
2. Design and use evaluation instruments for assessing instructional material quality.
3. Interpret evaluation findings and translate them into specific material revisions.

3.0 Main Content

3.1 Types and Purposes of Evaluation

There are three main types of evaluation relevant to instructional materials: formative, concurrent (process), and summative evaluation. Each serves a unique purpose and occurs at a different stage of the instructional process.

Formative Evaluation:

Formative evaluation occurs before or during the development of instructional materials, with the explicit purpose of improving them before finalization. It is the most important type of evaluation for ensuring material quality. Formative evaluation activities include: expert review (asking a subject matter expert to check the technical accuracy of content); design review (asking a colleague to evaluate the visual design and layout against established design principles); learner review (asking one to three learners from the target population to interact with a draft material and report what they understand from it this is called one-to-one evaluation); and small group evaluation (testing a draft material with a group of eight to twelve representative learners in a lesson-like setting).

Concurrent (Process) Evaluation:

Concurrent evaluation occurs during the actual use of an instructional material or package in a lesson or program. It involves observing how learners interact with the materials, noting points of confusion or disengagement, recording teacher facilitation challenges, and gathering informal learner feedback during and immediately after the lesson. Concurrent evaluation provides real-time data that can inform immediate adjustments to how the material is used (even if the material itself cannot be immediately revised).

Summative Evaluation:

Summative evaluation occurs after instruction has been completed, and its primary purpose is to judge whether the instructional materials and package achieved the intended learning outcomes. Summative evaluation compares learner performance on the post-test with their performance on the pre-test (measuring learning gains); gathers learner and teacher perceptions of the materials through questionnaires and interviews; and assesses the practical sustainability of the materials (did they remain in good condition? were they easy to use?).

The Distinction between Evaluating Materials and Evaluating Learning:

It is important to distinguish between evaluating the quality of instructional materials and evaluating learner learning. Poor post-test performance does not necessarily mean the materials were poorly designed it may reflect poor instruction, insufficient practice time, or learner factors such as absence or motivational issues. Conversely, strong post-test performance does not necessarily mean the materials were excellent learners may have learned despite, rather than because of, the materials. A complete evaluation considers both material quality and learning outcomes, while being careful about the causal inferences drawn.

Self-Assessment Exercise(s)

1. Distinguish between formative, concurrent, and summative evaluation of instructional materials. What is the primary purpose of each?

2. What is one-to-one evaluation? Why is it a particularly valuable form of formative evaluation for instructional materials?

3. Explain why strong post-test performance after using an instructional package does not automatically prove that the package was the cause of the learning gains.

3.2 Evaluation Instruments for Instructional Materials

Evaluation is only as effective as the tools used to collect evidence. Therefore, selecting and designing appropriate instruments is critical.

Learner Performance Tests (Pre-test/Post-test):

A pre-test and post-test pair is the most direct way to measure learning gains attributable to an instructional package. The pre-test (administered before instruction) establishes a baseline; the post-test (administered after instruction) measures what learners know and can do as a result. For the comparison to be meaningful, both tests must assess the same objectives, using the same or parallel items, at the same level of cognitive demand. The learning gain is calculated as the difference between pre-test and post-test scores.

Material Quality Rating Scale:

A rating scale is a structured instrument that asks evaluators (teachers, subject experts, or fellow educational technologists) to rate specific qualities of an instructional material on a numerical or descriptive scale. A well-designed rating scale for instructional charts and models might include items such as: 'The content is technically accurate' (1–5 scale); 'The main message is clearly communicated' (1–5); 'The text is legible from the expected viewing distance' (1–5); 'The material is appropriate for the target learner group' (1–5); 'The material is durable enough for repeated use' (1–5). The rating scale quantifies judgments that might otherwise be impressionistic, making it easier to identify specific strengths and weaknesses.

Learner Reaction Questionnaire:

A simple questionnaire administered to learners after using an instructional package gathers their perceptions of the material's clarity, engagement, relevance, and usefulness. Questions might include: 'Was the chart easy to understand?'; 'Did the activity cards help you practice the lesson content?'; 'What did you like most about the materials?'; 'What was confusing or unclear?'. Learner perceptions are valuable data, though they must be interpreted with awareness that learners may rate enjoyable materials highly even when learning gains are modest.

Teacher Observation Protocol:

A structured observation protocol allows a peer observer or supervisor to systematically record what they observe during a lesson in which an instructional package is used how the teacher introduces the materials, how learners interact with them, how questions and confusion are handled, and how the materials support or hinder lesson flow. Structured protocols produce more reliable and actionable data than informal, unstructured observation.

Self-Assessment Exercise(s)

1. Describe four evaluation instruments used to assess instructional material quality and explain the specific type of data each provides.

2. Design a material quality rating scale for evaluating improvised instructional models. Include at least six rating items.

3. Design a five-question learner reaction questionnaire for evaluating an improvised instructional package used in a JSS 2 biology class.

3.3 Interpreting Evaluation Findings and Revising Materials

Gathering evaluation data is only the beginning of the evaluation process. The data must be interpreted carefully and translated into specific, actionable material revisions. This section provides guidance on the interpretation and revision process.

Analyzing Pre-test/Post-test Data:

After administering pre- and post-tests, calculate the class average (mean) for each. If the mean post-test score is significantly higher than the mean pre-test score, this suggests that learning occurred though not necessarily that the materials alone caused it. Also analyze item-level data: which specific test questions did learners answer incorrectly both before and after instruction? These items may indicate concepts that the materials did not explain clearly enough, or that require additional practice activities.

Analyzing Rating Scale and Questionnaire Data:

Summarize rating scale data by calculating the mean score for each item and identifying items with consistently low ratings. Low-rated items indicate specific aspects of the material that need revision. Analyze learner questionnaire responses for patterns do many learners mention the same confusing element? Do learners consistently praise a particular component? These patterns guide targeted revision.

Prioritizing Revisions:

Not all identified weaknesses can be addressed simultaneously, particularly with limited time and resources. Prioritize revisions based on: severity of the weakness (does it cause instructional failure, or merely reduce efficiency?); feasibility of the revision (can it be made with available

materials and time?); and likely impact (will addressing this weakness significantly improve learning outcomes?).

Types of Material Revisions:

- Content corrections: Correcting factual errors or clarifying inaccurate representations.
- Layout revisions: Improving the visual organization, increasing text size, improving color contrast, or simplifying cluttered designs.
- Language revisions: Simplifying vocabulary, reducing sentence complexity, adding glossary support.
- Additional components: Adding a missing activity, an additional practice opportunity, or a scaffold for learners who struggled.
- Complete redesign: In rare cases, where evaluation reveals fundamental design flaws, a complete redesign may be necessary.

Documenting Revisions:

Every revision should be documented noting what was changed, why it was changed, and what evidence prompted the change. This documentation provides a record of the material's development history and supports ongoing quality improvement.

Self-Assessment Exercise(s)

1. How should a teacher analyze item-level pre/post-test data to identify specific content areas that the instructional package did not adequately address?

2. Describe the process of prioritizing revisions to instructional materials when multiple weaknesses have been identified through evaluation.

3. Prepare a revision plan for an instructional chart on which the following evaluation findings were recorded: (a) mean rating of 2.1/5 for 'text legibility'; (b) 60% of learners answered the post-test question on label identification incorrectly; (c) several learners noted confusion about the color coding used.

4.0 Conclusion

In this unit, you have explored the comprehensive process of evaluating instructional materials and packages. Evaluation, as you have seen, is not merely a concluding activity but a continuous, evidence-based process that informs design improvement. A competent educational technologist embraces evaluation as a professional responsibility, using it to refine practice and enhance learning effectiveness.

5.0 Summary

In this unit, you have learnt that evaluation is a continuous process that includes formative, concurrent, and summative stages, each serving a distinct purpose. You have also learnt that effective evaluation depends on appropriate instruments such as pre/post-tests, rating scales, questionnaires, and observation protocols. Furthermore, evaluation data must be carefully analysed and translated into targeted revisions, which should be prioritised and documented to support continuous improvement.

6.0 Tutor-Marked Assignment (TMA)

1. Compare formative and summative evaluation of instructional materials. When should each be conducted and what decisions does each inform?
2. Design a complete evaluation plan for an EDT 301 mini-project instructional package, specifying the type of evaluation, the instruments to be used, the data to be gathered, and how the findings will inform revisions.
3. Describe four types of evaluation instruments for assessing instructional material quality. For each, explain what specific information it provides that the others do not.
4. How should a teacher interpret pre-test and post-test data to determine whether their instructional package achieved its objectives?
5. What is the relationship between evaluation and professional development for an educational technologist? How does systematic evaluation of your own materials contribute to your growth as a practitioner?

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Unit 3

Sustainability of Instructional Resource Programs in Schools and Communities

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3.2 Factors Determining Sustainability of Resource Programs

3.3 Developing a Sustainability Plan

4.0 Conclusion

5.0 Summary

6.0 Tutor-Marked Assignment (TMA)

7.0 References/Further Reading

1.0 Introduction

In this unit, we turn our attention to a critical issue in educational development: sustainability.

Let us consider the reality across Nigeria and much of Sub-Saharan Africa—many well-designed instructional resource programs begin with strong funding, enthusiasm, and leadership, yet gradually decline once these initial supports fade.

At this point, it is important to note that sustainability is not automatic. It requires deliberate planning, institutional support, capacity building, and strong community ownership. An educational technologist who develops excellent instructional materials without ensuring their continued use, maintenance, and renewal has only completed part of the task.

Drawing from global educational development perspectives, including insights from organizations such as UNESCO, sustainability remains a cornerstone of effective and lasting educational innovation. This unit therefore explores the concept of sustainability, its dimensions, key determining factors, and how to develop a practical sustainability plan for instructional resource programs.

2.0 Learning Outcomes

At the end of studying this unit, you should be able to:

1. Define sustainability in the context of instructional resource programs.
2. Identify the key factors that determine the sustainability of school-based instructional resource programs.
3. Develop a sustainability plan for an instructional resource program in a Nigerian school or community context.

3.0 Learning Contents

3.1 Concept and Dimensions of Sustainability

Let us begin by examining what sustainability means in education. Sustainability refers to the ability of an instructional resource program to continue functioning effectively over time, even after initial external support or leadership has diminished.

Material Sustainability:

The physical materials produced through an instructional resource program must be maintained, repaired when damaged, and eventually replaced as they wear out. Material sustainability requires: durable initial construction (as discussed in Module 7); proper storage and handling protocols; a routine maintenance schedule; and a mechanism for producing new materials as old ones become unusable.

Financial Sustainability:

Most instructional resource programs have some ongoing costs materials for production and maintenance, transport for field visits, compensation for community resource persons, and storage solutions. Financial sustainability requires identifying sources of ongoing funding (school budget allocations, parent-teacher association contributions, community donations, government grants, NGO partnerships) and managing these resources transparently and effectively.

Human Sustainability:

Programs that depend on the knowledge, skills, and energy of one or two key individuals are highly vulnerable to the departure of those individuals. Human sustainability requires distributing skills and responsibilities across a team; documenting program procedures so that new participants can continue the program without starting from scratch; and building the capacity of new teachers and community members to take on resource program responsibilities.

Institutional Sustainability:

An instructional resource program that is integrated into the school's formal structures its curriculum plans, teacher deployment decisions, resource budget, and monitoring systems is far more likely to survive changes in leadership and external conditions than one that exists as a personal initiative. Institutional sustainability requires embedding the program in the school's policy documents, scheme of work, and annual development plan.

Community Sustainability:

Programs that have genuine community ownership where community members actively participate, see clear benefits, and take responsibility for the program's continuation are the most resilient over time. Community sustainability requires consistent community engagement, transparent communication, shared decision-making, and a demonstrated record of delivering educational benefits that the community values.

Self-Assessment Exercise(s)

1. Define sustainability in the context of instructional resource programs. Why is it a particular challenge in the Nigerian educational context?

2. Describe the five dimensions of sustainability: material, financial, human, institutional, and community. Give one specific strategy for addressing each dimension.

3. Why are programs that depend on a single dedicated leader particularly vulnerable to collapse? What strategies can reduce this vulnerability?

3.2 Factors Determining Sustainability of Resource Programs

Research has shown that certain factors consistently distinguish sustainable programs from those that fail. Understanding these factors allows educational technologists to design with sustainability in mind from the outset.

Factor 1: Leadership and Champion:

Virtually every sustainable educational program has one or more committed champions individuals who believe in the program, advocate for it within the institution, solve problems creatively, and sustain momentum through periods of difficulty. The presence of an effective champion significantly increases program survival. However, for the program to be truly sustainable, it must develop a succession plan, identifying and developing the next generation of champions before the current ones move on.

Factor 2: Integration into Core School Functions:

Programs that are integrated into the school's core instructional activities reflected in the curriculum, scheme of work, and timetable are more sustainable than those that exist as extracurricular or supplementary initiatives. When resource use is built into the official curriculum rather than treated as an optional extra, its continuation is supported by institutional momentum.

Factor 3: Teacher Capacity and Ownership:

Programs sustained by external trainers or consultants are inherently fragile. Programs sustained by school staff who have internalized the skills and values of the program are robust. Investing in the comprehensive training and professional development of school staff not just one or two individuals builds the distributed human capital needed for long-term sustainability.

Factor 4: Demonstrated Educational Impact:

Programs that can point to concrete evidence of educational benefit improved learner performance, increased learner engagement, stronger school-community relationships build the case for continued investment and institutional support. Systematic evaluation (as discussed in Unit 2) is not only a quality assurance tool it is a sustainability tool, because evidence of impact justifies ongoing commitment of time, resources, and institutional energy.

Factor 5 Resource Renewal Mechanisms:

Instructional materials wear out, community contexts change, and curriculum requirements evolve. Sustainable programs have built-in mechanisms for regular material renewal annual production days, scheduled learner production activities, community resource update exercises, and periodic curriculum alignment reviews.

Factor 6: Adaptability:

Programs that can adapt to changing circumstances; new curriculum requirements, staff turnover, shifts in community composition, changes in available resources are more sustainable than rigid programs tied to a specific set of materials or approaches. Building flexibility and adaptability into a program from the outset, rather than treating the initial design as permanent and final, significantly extends its useful life.

Self-Assessment Exercise(s)

1. Identify and explain six factors that determine the sustainability of instructional resource programs in Nigerian schools.

2. How does systematic evaluation of program impact contribute to program sustainability?

3. What is a succession plan in the context of educational program leadership? Why is it important for long-term sustainability?

3.3 Developing a Sustainability Plan

Let us now consider how to translate these ideas into practice. A sustainability plan is a structured document that outlines strategies for ensuring the long-term continuation of a program. Importantly, it should be developed at the beginning of the program, not after challenges arise.

Components of a Sustainability Plan:

Vision Statement: A clear, concise statement of what the program aims to achieve over the long term beyond the initial project period. The vision should be ambitious enough to motivate continued effort but realistic enough to be achievable.

Stakeholder Map: A list of all stakeholders with an interest in the program's continuation teachers, learners, parents, community leaders, school administrators, local government officials, NGO partners with a brief description of their current level of engagement and the strategies for deepening that engagement.

Human Resource Plan: A description of the human capacity needed to sustain the program, the current state of that capacity, and the training and capacity building activities planned to address gaps. Includes identification of potential champions and a succession plan for key roles.

Financial Plan: A description of the ongoing financial needs of the program, the identified funding sources, and the strategies for securing and managing these resources. Includes a contingency plan for periods of reduced funding.

Material Renewal Plan: A schedule and process for the regular review, maintenance, and renewal of instructional materials. Specifies who is responsible, when renewals will occur, and what resources will be used.

Monitoring and Evaluation Plan: A brief description of how the program's ongoing effectiveness will be monitored and evaluated, what indicators will be tracked, and how findings will be used to improve the program.

Risk Analysis: An identification of the main risks to program sustainability (e.g., teacher transfer, budget cuts, community disengagement) and the mitigation strategies for each.

Sample Sustainability Strategies for Nigerian Schools:

- Establish a School Resource Committee with formal responsibilities for resource management and renewal.
- Integrate resource production into the school's annual activity calendar as a regular, budgeted event.
- Build resource utilization into the official scheme of work for all subjects.
- Train all subject teachers in resource production techniques, not just a specialist few.
- Establish a community resource partnership with formal MoUs and annual review meetings.
- Develop a school resource center with a catalogued, maintained collection of materials.

- Document all resource production processes and store documentation in the school resource center for use by future staff.
- Involve learners in resource production and maintenance as a regular curriculum activity.
- Advocate with school administrators and local government for dedicated budget lines for instructional materials.

Self-Assessment Exercise(s)

1. List the components of a sustainability plan for an instructional resource program and describe the purpose of each.

2. Develop a risk analysis for an EDT 301 mini-project instructional package, identifying three specific sustainability risks and a mitigation strategy for each.

3. Design a one-year sustainability plan for an improvised instructional resource program in a rural secondary school with 15 teachers, limited budget, and strong community support.

4.0 Conclusion

This unit has highlighted sustainability as a central concern in instructional resource development. As you reflect on this, it becomes clear that sustainability is not an optional consideration but a fundamental requirement for meaningful educational impact.

A sustainable instructional resource program is one that is embedded in the school system, supported by trained personnel, financed effectively, maintained regularly, and owned by the community. Such programs transform schools into vibrant, resource-rich learning environments.

5.0 Summary

In this unit, you have learnt that sustainability involves multiple dimensions—material, financial, human, institutional, and community—which must all be addressed for long-term success. You have also examined six key factors that influence sustainability, including leadership, curriculum integration, teacher ownership, demonstrated impact, resource renewal, and adaptability.

Furthermore, you have explored the structure of a sustainability plan, which includes vision setting, stakeholder engagement, resource planning, and risk management. Most importantly, you have understood that sustainability must be built into a program from the beginning.

6.0 Tutor-Marked Assignment (TMA)

1. Define sustainability in the context of educational resource programs and explain why it is a particularly important challenge in Nigeria.
2. Describe the five dimensions of sustainability and give one concrete strategy for addressing each dimension in a Nigerian secondary school context.
3. Identify and explain the six key factors that determine whether an instructional resource program survives over time.
4. Develop a complete sustainability plan for an instructional resource program in a secondary school of your choice. Include all seven components of the plan.

5. Reflect on the complete EDT 301 course. How have the concepts and skills developed across all ten modules prepared you for a career as an educational technologist in Nigeria? Which module do you consider most important to your professional development and why?

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Course Closing Notes

Congratulations on completing EDT 301 Globalization of Instructional Resources.

Across these ten modules and thirty study units, you have built a comprehensive foundation in the theory, design, production, and management of instructional resources for educational practice in Nigeria and similar contexts. You have moved from conceptual understanding (Modules 1–3) through classification and design principles (Modules 4–6), to practical production skills (Modules 7–8), and finally to the project, evaluation, and sustainability competencies (Modules 9–10) that will define your professional practice as an educational technologist.

Key Competencies Developed in This Course

By successfully completing this course, you should now be able to:

1. Explain globalization's impact on educational resource development and apply the concept of glocalization in material design.
2. Systematically identify, map, and mobilize human and non-human community resources for educational purposes.
3. Classify and select appropriate instructional resources for specific learning objectives and learner populations.

4. Apply key principles of message design, Universal Design for Learning, and culturally responsive design.
5. Use the ASSURE model to plan complete, learner-centered, resource-based lessons.
6. Design and produce high-quality improvised instructional materials from locally available resources.
7. Collect, prepare, and use natural, cultural, and waste materials as instructional resources.
8. Plan and execute a complete instructional material design mini-project, from needs analysis to presentation.
9. Evaluate instructional materials formatively and summatively using appropriate instruments.
10. Develop sustainability plans for instructional resource programs in schools and community settings.

A Final Word on Professional Practice

The vision that animates EDT 301 is of a Nigerian education system in which every school regardless of its budget, its location, or its access to commercial materials is a rich, stimulating, resource-filled learning environment. This vision is achievable. It is not contingent on government funding, NGO intervention, or imported commercial materials. It depends on the knowledge, skill, creativity, and professional commitment of Nigerian educators.

Every chart you draw with care, every model you build from locally available materials, every community resource person you respectfully invite to share their knowledge, every waste material you transform into an effective teaching tool these are not compromises. They are expressions of a deeply principled educational practice that honors the knowledge of your learners, the richness of their communities, and the professional dignity of the teaching profession.

Go forth and teach well. Nigeria's learners deserve nothing less.

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