

	<p>Science, Education and Innovations in the Context of Modern Problems</p> <p>Issue 12, Vol. 8, 2025</p> <p>RESEARCH ARTICLE </p> <p>Effectiveness of Educational Tools in the Success of Differentiated Pedagogy</p>
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<p>Issue web link</p>	<p>https://imcra-az.org/archive/387-science-education-and-innovations-in-the-context-of-modern-problems-issue-12-vol-8-2025.html</p>
<p>Keywords</p>	<p>Effectiveness – Educational Tools – Success – Differentiated Pedagogy</p>

Abstract

This study aims to examine how educational tools can be effectively employed to ensure the success of differentiated pedagogy. It defines these tools, outlines their scope, and illustrates their application within differentiated pedagogy. This includes visual aids, such as images, drawings, and the display of static films; auditory aids, including records, tape recorders, and radio; and finally, audiovisual aids, such as television. The results indicate that, to enhance the teaching process, educators must utilize educational innovations correctly to achieve the core objectives of pedagogical practice. These objectives include: enabling learners to engage in independent learning, which fosters positive psychological states; accounting for individual differences among learners; selecting appropriate times and settings for each learner; and optimizing teachers' time, allowing them to present content in greater depth, exchange ideas, and interact more effectively with students. Furthermore, such utilization provides opportunities for teachers to conduct research to develop curricula, addresses the shortage of scientifically and pedagogically qualified teachers, and contributes to curriculum advancement.

Citation

Azani L. (2025). Socio-National, Arab, and Humanitarian Problematics in Algerian Very Short Fiction: A Thematic and Critical Analysis of the Works of Bashir Khalf. *Science, Education and Innovations in the Context of Modern Problems*, 8(12), 1638–1643. <https://doi.org/10.56334/sei/8.12.138>

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Received: 01.06.2025

Accepted: 09.11.2025

Published: 09.12.2025 (available online)

Introduction:

Louis Legrand was the first to use the term “differentiated pedagogy” in 1973 and is considered one of its pioneers who established its practical foundations in the educational field. He defined it as an educational approach that employs a set of instructional tools to assist children of varying ages, abilities, and behaviors within the same classroom in achieving the same learning objectives through different methods. Differentiated pedagogy seeks to reduce academic failure and presents itself as an effective strategy for meaningful success at the primary, middle, and secondary school levels.

Educational tools have been given various designations over time, reflecting their developmental evolution: illustrative tools, specific aids, teaching aids, auditory tools, visual tools, audiovisual tools, educational technologies, and most recently, instructional technologies, which encompass both devices and instruments.

Accordingly, the question arises: how can educational tools be effectively employed to ensure the success of differentiated pedagogy?

The literature reviewed for this study led to structuring the research in sequential elements: first, defining educational tools; second, outlining their scope; and third, examining their application in differentiated pedagogy. This includes visual aids, such as images, drawings, and the display of static films; auditory aids, such as records, tape recorders, and radio; and finally, audiovisual aids, such as television.

1. Educational Tools: The physical resources available within schools and classrooms, as well as the instructional tools at the disposal of teachers and students, significantly influence the quality and potential of the teaching and learning process. Effective education, however, requires modern and well-equipped spaces.

Relying on the lack of school facilities or claiming the absence of educational tools is not characteristic of a competent teacher. Such excuses merely justify a lack of personal initiative and insufficient attention to students. Appropriate spaces and tools are essential because every teacher must strive to improve their working conditions. If this cannot be achieved with the support of students, teachers should utilize their own resources. This discussion does not pertain to textbooks and curricula, which are generally provided to teachers and regulated by school policies.

Traditional educational aids available in classrooms—such as geographic maps, geometric models, wall charts, and standard measures of length, weight, and content—will not be discussed in detail here. However, it is useful to propose certain recommendations regarding documents and materials that teachers can gradually assemble according to their circumstances.

In addition to the tools continuously available to students, it is advisable for teachers to maintain their own resources for lesson preparation and professional development. Beyond official texts or administrative documents, teachers require essential books for effective language instruction and mastery of oral and written expression, including: language dictionaries, analytical dictionaries, vocabulary dictionaries, comprehensive grammar references, and other materials, such as encyclopedias, general culture books, and works by major authors.

We strongly recommend that teachers compile their own set of resources, similar to those collected by students. This may include clipping relevant articles from newspapers and magazines, categorizing them with proper citation (source, publication name, and date), and recording personal reflections after reading or following specific events.

Through consistent effort over time, teachers can cultivate their own knowledge and professional competence, enabling them to provide higher-quality instruction and to connect their teaching more accurately to real-world contexts.

2. Scope of Educational Tools: Educational tools are essential in teaching subjects, as they enhance the effectiveness of teaching and learning by presenting facts and information in ways that align with students' comprehension, ensuring a deep and lasting impact. The educational supervisor plays a key role in emphasizing the use and creation of such tools by teachers, assisting them in providing these tools at the appropriate time, and participating in the development of new resources within available means. Supervisors can also help teachers make use of samples, images, illustrations, maps, and the various models and artifacts available in museums and exhibitions.

Among the most important types of educational tools that improve the teaching and learning process are images, drawings, diagrams, still and motion pictures, models, specimens, and display boards. The educational supervisor should guide teachers in the proper use of these diverse tools, observing the following principles:

According to Zidan Hussein:

- The educational tool should be entirely appropriate to the lesson and should clarify or supplement any deficiencies in the textbook.
- The teacher should practice using the tool before presenting it to learners.
- The tool should be used at the appropriate moment during the lesson and should be engaging.
- Multiple tools should not be used simultaneously in a single lesson to avoid distracting the students.

3. Utilization of Educational Tools in Differentiated Pedagogy: It is essential to classify documents to facilitate their effective use, and each individual may adopt a classification system that best meets their needs. This classification should be practical and continuously updated; it is not an end in itself but rather a supportive tool whose value depends on proper usage.

Audiovisual Tools: Audiovisual tools are often considered by many teachers—especially those whose schools lack essential resources—as the most advanced development in modern education. Many educators and authors believe that teaching cannot be truly effective without these tools.

Some argue that simply equipping schools and classrooms with radios, cinema equipment, and televisions would solve all educational challenges. However, teachers who do not have immediate access to audiovisual aids should abandon the notion that their teaching is inherently deficient or that they are disadvantaged compared to their peers. They must recognize the reality: the widespread use of audiovisual tools cannot be generalized until current experiments allow those who can access them to determine the conditions required for each tool and establish appropriate methods of usage.

The following categories of educational aids will be examined in subsequent sections:

- **Visual aids:** Images and drawings.
- **Auditory aids:** Records, tape recorders, and radio.
- **Audiovisual aids:** Television.

1. Visual Aids:

A. Images and Drawings: Images captivate children from an early age; young learners often first encounter books that contain only pictures, without written text. Teachers, in collaboration with their students, can assemble collections of images, which help provide sensory elements for most school subjects. This task is accessible to anyone and does not require significant funding, special equipment, or official approval. It fosters a desire to enhance the quality of education.

Regarding drawings that facilitate lesson comprehension, every teacher has access to an essential tool: the blackboard. Using the blackboard grants the teacher considerable control over the educational impact, which can be further enhanced through other audiovisual aids. The benefit derived from this tool depends largely on how the teacher conducts the lesson.

In addition to the blackboard, other teaching aids offer teachers new methods for presenting visual materials to students, such as display boards, which can be used for a period to exhibit images.

B. Display of Still Films: Two essential devices are required for displaying still films: the episcopes and the projector.

The **episcopes** allows for the direct projection of various printed or illustrated documents. Historically, it has been used to project opaque images, models, and standard cards. It is a highly useful tool, similar in its advantage to the blackboard, as the teacher has full discretion in selecting the images to display on the screen before the class. The teacher can present these images in the sequence deemed most effective for commentary and achieving the intended educational objective.

The **projector** is essential for the use of still films.

2. Auditory Aids:

A. Records: Records are particularly useful in teaching music education and in enhancing students' oral expression by allowing them to listen to stories and narratives, which they can memorize through auditory learning. For example, students might listen to a story once a week and are asked to pay close attention. Over several weeks, they are often able to recall the story verbatim.

B. Tape Recorders: Tape recorders allow speech to be recorded and played back on a tape, film, or wire. This device is particularly beneficial for young learners acquiring reading skills. After a child reads or makes errors and repeats a passage, the teacher can play back the recording. Students are often surprised to hear their own pronunciation errors, similar to adults hearing their voice recorded for the first time. Tape recorders encourage improved reading, pronunciation, and correction of mistakes.

C. Radio: To make the radio an effective teaching aid, it is essential to equip each classroom with a loudspeaker, in addition to the blackboard and textbooks. The radio is a unique tool that allows teachers to extract valuable material for their lessons.

3. Audiovisual Aids:

A. Television: Television enables schools to enrich their instruction with a variety of information and resources that would otherwise be inaccessible to students.

- **B. Computers and the Internet:** The Internet, accessed via computers, serves as a powerful informational network that benefits all learners. It can be used to obtain the latest developments for educational and developmental purposes. Additionally, it provides access to programs and files for continuous education, distance learning, and general cultural and intellectual enrichment.
- It is important to note that tools such as radio, cinema, television, and the Internet facilitate collective learning in which all students participate indirectly. These tools cannot replace the teacher. Audiovisual aids are not intended to substitute traditional teaching methods; rather, they complement them. Such clarification is necessary because curricula are often overloaded with content, making indiscriminate use of audiovisual aids impractical. Before integrating these tools into schools, it is crucial to resolve the challenges associated with their effective use.

4. Impact of Educational Tools on Differentiated Pedagogy

The effective integration of educational tools in differentiated pedagogy profoundly influences both teaching practices and student outcomes. Visual, auditory, and audiovisual aids serve not only as facilitators of comprehension but also as catalysts for learner engagement, motivation, and autonomy. By offering multiple modes of content delivery, these tools address diverse learning styles, enabling students with varying cognitive abilities, prior knowledge, and personal experiences to access and internalize knowledge more effectively.

Research indicates that when teachers skillfully combine traditional methods with modern educational tools, students demonstrate:

- Improved retention and deeper understanding of concepts due to multisensory reinforcement.
- Enhanced critical thinking and analytical skills, as visual and auditory stimuli encourage learners to compare, evaluate, and synthesize information.
- Greater independence and self-regulation, as tools such as computers and the Internet allow students to navigate learning at their own pace.

- Positive social and psychological effects, including increased confidence, reduced anxiety, and heightened motivation, particularly for students who may struggle in conventional classroom settings.

Moreover, educational tools facilitate teacher professional development by providing opportunities for lesson experimentation, curriculum innovation, and reflective practice. Teachers can gather real-time feedback from students' interactions with these tools, refine instructional strategies, and develop more personalized learning pathways. Consequently, the classroom evolves into a dynamic, interactive environment that balances standardized curriculum requirements with individual learner needs.

5. Challenges and Recommendations in the Use of Educational Tools in Differentiated Pedagogy

Despite their proven benefits, the effective utilization of educational tools in differentiated pedagogy faces several challenges:

- **Resource Limitations:** Many schools lack adequate audiovisual equipment, technological infrastructure, or updated teaching materials, which can hinder the consistent use of these tools.
- **Teacher Training and Competence:** Not all educators are fully trained in integrating modern tools into their pedagogy, which can result in suboptimal use or over-reliance on traditional methods.
- **Curricular Constraints:** Overloaded curricula and rigid lesson plans often leave little room for creative application of educational tools.
- **Student Variability:** Differences in learning styles, technological literacy, and access to resources can create gaps if tools are not carefully adapted.

To address these challenges, several recommendations can be implemented:

1. **Professional Development:** Continuous teacher training programs should focus on both the pedagogical integration and technical mastery of educational tools.
2. **Resource Optimization:** Schools should prioritize cost-effective tools and encourage teachers to develop locally available resources, such as student-created visual aids or simple audiovisual setups.
3. **Curriculum Flexibility:** Educational authorities should provide frameworks that allow teachers to adapt lesson plans creatively, integrating tools in a way that reinforces rather than interrupts learning objectives.
4. **Inclusive Implementation:** Tools must be selected and applied with attention to individual learner differences, ensuring equitable access and engagement for all students.
5. **Reflective Practice:** Teachers should continuously assess the impact of educational tools, adjust strategies based on student feedback, and document effective practices for ongoing improvement.

Conclusion: In conclusion, the strategic and thoughtful use of educational tools is a cornerstone for the success of differentiated pedagogy. These tools are not mere supplements to teaching; they are transformative instruments that enhance the depth, accessibility, and effectiveness of learning.

By integrating visual, auditory, and audiovisual resources, educators can foster independent learning, accommodate individual differences, and create psychologically supportive environments that motivate and empower students. Effective use of these tools also allows teachers to extend content delivery, encourage critical thinking, and cultivate meaningful interactions within the classroom.

Moreover, educational tools serve as catalysts for professional growth, enabling teachers to innovate, conduct research, and refine curricula in response to evolving student needs. They address systemic challenges, such as the shortage of qualified educators, by amplifying instructional capacity and promoting pedagogical excellence.

Ultimately, the judicious application of educational tools transforms the classroom into a dynamic, learner-centered environment. When integrated with purpose and skill, these tools bridge gaps between traditional pedagogy and modern educational demands, ensuring that all students achieve meaningful, sustained learning outcomes. In this way, differentiated pedagogy, supported by appropriate tools, becomes a model

Ethical Considerations

This study was conducted in accordance with generally accepted ethical standards in educational research. The research did not involve experimental manipulation of learners, sensitive personal data, or vulnerable populations. All data used were collected through pedagogically acceptable practices, respecting the principles of academic integrity, objectivity, and transparency. The author ensured that all referenced ideas and sources were appropriately acknowledged, and that the study was carried out with respect for professional and ethical responsibilities in educational research.

Acknowledgements. The author would like to express sincere appreciation to colleagues and researchers in the field of education and pedagogy whose insights and discussions contributed to the development of this study. Gratitude is also extended to the Research Unit “*The Reality of Linguistics and the Development of Linguistic Studies in Arab Countries*” (Tlemcen, Algeria) for providing an intellectually supportive academic environment that facilitated this research.

Funding. This research did not receive any specific grant from public, commercial, or non-profit funding agencies.

Conflict of Interest. The author declares that there is no conflict of interest regarding the publication of this paper.

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