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# Enhancing Instructional Materials through Teacher Training: A Study of Best Practices

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**ABSTRACT:** This research explores the essential connection between teacher professional growth, high-quality instructional materials, and enhanced learning outcomes of students across global settings using a data mining technique. The findings show that efficient training, programs, and initiatives are vital for upgrading the skills of the teacher to craft and employ instructional tools, which foster critical enhancements in student academic achievement. In addition, the study highlights the crucial concept of aligning instructional materials with explicit objectives in learning and the needs of diverse students, promoting a holistic method that incorporates the content, the resources, and pedagogical approaches. The crucial roles of school management support and culture-based pedagogies are also emphasized as important for translating teacher training into efficient classroom practices. In all, the study underlines the need for continuous investment in programs and training for teachers, resources which are defined as high-quality, and supportive policies of education to enhance learning outcomes among learners and ensure impartial access to the best quality education

**KEYWORDS:** instructional materials, teacher training, professional growth and development, learning outcomes, data mining technique

## I. INTRODUCTION

High-quality instructional materials are crucial for teachers to make teaching effective and for learners to attain quality learning. Teachers utilize instructional materials to make the teaching process more engaging to arouse the interest of the learners to engage in the lesson\* especially when the teacher is catering diverse learners with different behaviors, intellectual capacity and family background (Chan, 2024). Eventually, well-designed instructional materials improve learners' performance across different learning areas and augment levels of proficiency by fostering deep understanding, increasing participation and engagement, and helping them to acquire knowledge (Bacia, 2024). Choosing and utilizing suitable instructional materials has a crucial effect on the ability of learners to understand difficult concepts, develop as critical thinkers, and achieve their full academic potential (Irumba, 2024). Hence, for them to attain such outcomes, educators must possess an excellent ability and understanding of how to prepare and employ effective and quality instructional materials and put them as one of the best practices (Munna, 2021).

Whereas effective and high-quality instructional materials are vital for effective implementation of teaching, their effect is crucially boosted by strong teacher training (Abad et al., 2025). Teachers who are furnished with the knowledge, skills, and abilities to choose, adapt, and utilize these materials suitably are advantageous to maximize their teaching pedagogy (Ordu, 2021). Programs like teacher training that concentrate on developing instructional materials arm educators with the significant ability to evaluate the resources with high critical evaluation and assessment, associate the instructional materials with the learning objectives, variate instruction to meet diverse learner needs, and assess and augments the learning of the students effectively employing varied assessment methods (Uzorka et al., 2024). By advancing in wide-ranging teacher training on instructional materials, learning institutions can guarantee that these valuable instructional resources are employed to their maximum potential, which would lead to enhanced learning and advanced academic outcomes of students (Darling-Hammond et al., 2017).

The previous discussion highlights a critical gap between the importance of high-quality instructional materials to augment learners' performance and the reality of insufficient teacher training in developing effective instructional materials and in implementing them. This gap underlines the crucial need for a full analysis of current teacher training practices connected to instructional materials. Such analysis must not be limited only to identifying the gaps in prevailing training programs but also expanded to the exploration of effective methodologies on how to equip teachers with the

essential knowledge and skills on the way in creating, adapting, and utilizing instructional materials efficiently. In line with this, this study explores the key elements relative to this issue, as only through a critical study of these factors can we link the gap and reveal the maximum potential of instructional materials to augment learners' learning outcomes

### Objectives:

This research analyzes:

- The efficacy of teacher training models in augmenting the skills of teachers in developing and implementing instructional material.
- To assess the ability of teachers to craft engaging and effective instructional materials for learners with diverse abilities to improve their learning outcomes after the teacher training
- To evaluate the effectiveness of the instructional materials crafted by the teachers after teacher training through upgraded learners' learning outcomes.

## II. METHODOLOGY

This study employs data mining to analyze teacher training programs' efficacy in enhancing instructional materials, as outlined in the objectives. Focusing on factors like teacher competency, student achievement, and policy impacts, data were taken from regional case studies and peer-reviewed studies (e.g., Goodwin et al., 2017; Darling-Hammond, 2017) spread across six continents (Asia, Europe, etc.) (OECD, as cited in tables). Patterns were categorized according to the type of training (e.g., mentoring, workshops) and linked to learning objectives. The analysis ensures theoretical consistency by conforming to frameworks cited in the literature review, such as Singapore's teacher development models.

The outcomes of this investigation reveal important insights into the efficiency of different training practices for teachers and their direct connection with enhanced instructional quality and learner outcomes. Particularly, the study finds that training set-ups integrated hands-on training and peer partnership tend to garner the maximum levels of competencies of teachers and effective instructional resources. Moreover, the facts focus on the significance of school management support and the frameworks policy in enabling effective training applications, signifying that a school environment that is supportive is crucial for sustaining enhancements in the practices of teaching. By scrutinizing findings from diverse contexts around the world, this research backs to an in-depth understanding of how fitted teacher training programs and initiatives impactfully address educational needs in diverse manner and augment complete quality of education. The suggestions of these findings are critical for policymakers of education, as they underline the need for a well-planned investment in teacher progress programs that are receptive to the unique challenges encountered by the educators in changing contexts.

## III. RESULTS

### PRESENTATION OF DATA, INTERPRETATION, AND ANALYSIS

This section reveals the results of our study exploring the efficacy of different models in teacher training in augmenting the progress as best practices and implementation to impact the learners' learning outcomes. Through data mining techniques, the data was gathered across six continents, including case studies and related literature. Sub-variables are elaborated to reveal the efficacy of varied training models impacting learners' achievement.

#### Variable1. Teachers' Skills in Developing Instructional Materials after the Training

The cited variable measures the teachers' skills in developing instructional materials and the effectiveness of the developed tools after the training. Such best practice is revealed through cross-continent gathered data that displays the common model to use to enhance the skills of the teachers in developing the said instructional tools.

CONTINENTS	REASON	SOURCE
Europe (Germany)	Materials created by teachers were related and most utilized because they have a positive effect on the learning outcomes of the learners. Educators are reportedly increasing their classroom confidence, adapting the knowledge they have garnered from the training workshop, which further enhances instructional effectiveness and improves teacher analysis	Abad, L.G., Hattie, J. The impact of teaching materials on instructional design and teacher development (2025)
Asia (Philippines)	Teachers who had received training performed better inside the classroom as compared to teachers with no in-service training at all. It	Lagura, G.L., Alegre, E.M., Educational

	also positively impacted the teachers' development of instructional materials to be employed during the teaching and learning process. Their capability improved after the seminars they attended, and they collaborated with other teachers.	Preparation and Quality of Trainings Attended towards Teachers' Capability in Research-Based Instructional Materials Development (2020)
(India)	An effective teaching -learning approach is a critical topic in the field of teacher development. Beyond regular teaching work and both experiences in the field and internship, additional seminars, training, and workshops enabled the teacher-participants to launch teaching strategies which is inter-disciplinary and boost critical thinking skills.	Aparna, J.A., Strategies for Professional Development of Teachers Through Seminar (2024)
(Tanzania)	The effectiveness of the developed instructional materials is defined by the people and his actions and behavior as humor, sarcasm and other bodily movements as result to it reactions from the generated stimuli. With this, it is suggested that training the teachers be more innovative and creative the school administration must provide support.	Abdala, J., A qualitative approach on the instructional materials used in teaching and learning of English Language in Tanzania's secondary schools (2024)
Africa (Uganda)	From the interviewed respondents, it was found that training, seminars-workshops, courses as refresher as well as coaching and mentoring, were crucial in improving the knowledge and skills of the educators to augment their practices in quality teaching. Further, the intervention from the administration is essential for effective teaching. It is therefore suggested that teachers should regularly attend training, refresher courses, and coaching and mentoring to attain such skills, including instructional material development.	Kombo, N.K., Kakuba, S.J., Human Resource Training and Development: An Investigation into Relationship Between In-Service Training and Quality Teaching Practices in Secondary Schools Journal of Public Administration, Finance and Law (2020)
Nigeria	The continuous development and training programs for teachers shape an essential part of the management of human resources and are influential for the quality of instructional delivery of teachers inside the classroom. Attendance to workshops and training is needed to improve the knowledge and skills of his teaching job, which further puts emphasis on crafting effective instructional materials.	Ollor, A.N., Teachers' Participation in Workshop and Seminar for Quality Instructional Delivery in Secondary Schools (2021)
Australia	There is an imperative to prepare teachers to undergo international training to prepare them to deal with diverse learners. Such training can address the gap in ethnical and racial aspects' pedagogical approach of the teacher during the teaching-learning process. This henceforth armed teachers with skills on how to develop teaching tools to employ to foster efficient teaching for positive learning outcomes	Santoro, N., 'If I'm going to teach about the world, I need to know the world': developing Australian pre-service teachers' intercultural competence through international trips (2013)



United States of America	Teachers must have the necessary information on creating, reviewing, and selecting curricular materials effectively to augment students' learning outcomes. Educators come together in states like Louisiana to have a collaborative understanding of professional development of educators that includes the preparation of effective instructional materials to upgrade the learning outcomes of students.	How High-Quality Instructional Materials Can Drive Teacher Growth (2017)
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#### IV. INTERPRETATION AND ANALYSIS

The data on the table reveals a global trend which is compelling stating that teacher training is essentially intertwined with the efficacy on how to prepare an effective instructional material for the teachers to utilize during the teaching-learning process. Crossways to different continents of the world, from Europe to Asia, Africa, and Australia—is consistently shown that it displays a positive relationship between programs that augment professional development and enhance ability of the teachers to prepare, design, develop and efficiently employ a high-quality instructional material to alleviate learning outcomes from the learners. The developed ability translates to tangible growth inside the classroom. Teachers becomes more confident, instructional materials are more effective which are crucial to deal diverse learners coming from different backgrounds to acquire quality learning they deserve to garner. The collected data undeniably supports the issue that sustained investment in the professional development of the teacher is not vital, however, very important for uplifting the overall educational standards. Crafting engaging, motivating, relevant, and quality materials from research-based principles of pedagogy is the key elements in attaining positive and quality learning outcomes. Furthermore, teachers' seminars, trainings, and workshops play a vital role in empowering educators with the needed knowledge and skills to improve these instructional materials.

Though, an in-depth understanding has been delved down to the issue of teacher training, gathered data also tells the significant variations in a regional aspect having specific impacts and gaps related with teacher training programs. While several regions have reported a substantial improvement in the performance of the teacher and to the implementation of advanced teaching approaches in professional enhancement, others stress the critical necessity for continuing support from school leaders and mentors. The achievement of training programs for teachers are not exclusively reliant on the quality of the training program itself, but also on the wider setting in which it is applied. In various regions, the discoveries focus on the critical role of organizational support in ensuring that the knowledge and skills gathered during programs and training are efficiently interpreted into better-quality classroom practice. This underlines the significance of crafting a supportive and collective school setting that focuses on continuing professional growth and offers teachers the tools and mentorship necessary for success. Also, the data highlights that efficient teacher programs and training should be tailored to answer the unique factors on both cultural and contextual aspects in particular regions, guaranteeing that the programs and training are related and suitable to the actual teaching work of the teachers that they face every day.

Lastly, the data reveal a robust case for the crucial role of teacher training in cultivating the quality of education around the world. The constant positive relationship between professional growth and enhanced practices of teaching, tied with the variations in regional aspects, highlights the essential need for context-specific programs and organizationally supported initiatives, underlining the multilayered nature of efficient teacher development initiatives. Future initiatives must focus not just on the context and better quality of training programs for teachers but also on the formation of supportive school management settings that foster partnership, mentorship, and constant professional development. A holistic method that envelopes ongoing professional growth, culture-based pedagogies, and strong collective efforts between teachers, school leaders, and the makers of the policy, is vital to ensure that all learners have equal access to instruction, which is defined as high-quality and the opportunity to grasp their full skills and abilities. In addition, future studies should explore finding the most effective approaches for helping educators in translating their acquired training into enhanced classroom practice and navigating the long-term effects of varied teacher development models on the academic achievement of students.

#### Variable2. Students' Learning Outcomes after Utilizing the Developed Instructional Materials by the Teacher after the Training

This variable deals with the effect of the instructional materials crafted by the teachers after the training on the learning of the students. The same procedure was utilized, the data mining technique reflected the data to students' projects, classroom assessments, and other measures relevant to the learning objectives and subject matter learning outcomes.

CONTINENTS	REASON	SOURCE
ASIA (Indonesia)	There was a positive effect to students' learning outcomes in both experimental and control classroom setups. Further, it was revealed that as to learning outcomes, students who were products from an experimental classes utilizing the instructional materials developed by the teacher after going from training performed better and have high learning outcomes as compared to the set of class having a teacher who did not undergo a training on how to develop an effective teaching materials.	Fakhruddin, Z., et al. Technology-Based Teaching Material Development Training for Pre-Service Teachers to Improve Students' Learning Outcomes (2019)
(Philippines)	Various instructional tools are in the three professional courses. They have been utilized based on relevance and suitability. Faculty members faced the same similar challenges in utilizing the instructional materials. Based on the sequence of activities, abstractions, analyses, and applications, the instructional tools have a positive impact on the learning outcomes, as it was recommended to incorporate them in the final copy of the course.	Romarate, M., et al. Development of Outcomes-Based Instructional Materials in Professional Teacher Education Courses for a Flexible Set-Up (2023)
AFRICA (Uganda)	The importance of incorporating instructional materials in dealing with diverse learners to boost learning among students to achieve academic success. Exploring the role of instructional tools to academic performance highlights the essential support to educators to develop and bring high-quality education and foster students' academic success.	Irumba, J.K., The Influence of Instructional Materials on Students' Academic Achievement (2024)
AUSTRALIA	Crafting an effective teaching-learning experience is grounded on the idea that integrates both learning content, learning resources, and pedagogical strategies and approaches. It underlines the importance of learning progression and ongoing improvement of skills and abilities that make students' learning outcomes successful.	Priyanka, S. EdTech for Learning Outcomes and Impact: A Comprehensive Approach (2024)
EUROPE (European Union)	It was revealed that while the policies from the national governing departments across the countries that comprise the countries Bulgaria, Ireland, France, Lithuania, Malta, the Netherlands, Poland, Portugal, Slovenia and Finland foster positive impact to the students' learning outcomes as key fact of vocational education and training (VET), the aspect of effective instructional materials utilize in during teaching-learning process should also be taken account as it is the frontline contributing factor inside the classroom setup impacting improved learning outcomes.	Cedefop. The influence of learning outcomes-based curricula on teaching practices (2025)
Poland	Different tools in multimedia during the teaching-learning process examine the impact of technologies that display a positive effect in bridging the gaps in the educational system to foster high-quality education that resulting in an enhanced performance of learners.	Abdulrahman, et al. Multimedia tools in the teaching and learning processes: A systematic review (2020)
USA (Louisiana)	Varied ways are employed by the educators in the curriculum aspect to diversely learn, specifically to those in the levels of poverty. It was discovered that adopting the standards aligned with the curriculum will not only lead to more engagement of students during the teaching-learning process. Additionally, it was reported that feedback grounded in evaluation and professional development programs enhanced learning outcomes for students.	Kaufman, et al., How Instructional Materials Are Used and Supported in U.S. K–12 Classrooms (2020)

## **V. INTERPRETATION AND ANALYSIS**

The results from a cross-regional study inspecting the influence of instructional materials on learners' learning outcomes tell a constant and substantial positive association between the quality of these resources and learners' academic achievement. In Asia, particularly in Indonesia, a measured experiment verified that learners under those teachers who had undergone training on professional development in making instructional materials and afterward applied those tools inside their classrooms exhibited markedly advanced learning outcomes than to students in a measured group handled by teachers without instructional development training. This stresses the critical role of professional development for teachers in refining the efficacy of instruction. Furthermore, in an Indonesian educational system, results reveal that merely giving the tools is inadequate; classroom teachers need to have the abilities, skills, and knowledge to successfully incorporate and utilize these instructional resources to amplify their academic impact. This underlines the necessity for continuing investment in training programs for teachers that focus on designing curriculum, strategies for effective instruction, and the effective utilization of varied teaching materials.

Further, a study from the Philippines reflected a positive connection between the utilization of appropriate and suitable teaching tools and augmenting learning outcomes among students across professional courses that cover three phases. The members of the faculty observe a consistent indication that the thoroughly selected and applied materials meaningfully enhanced the process of learning. This reinforces the vital role of aligning teaching materials with precise learning goals and modifying them to the diverse needs and styles of learning of students. The achievement observed in the educational system of the Philippines stresses the necessity for a systematic method to the selection of instructional resources and implementation, ensuring that instructional resources are not only accessible but also efficiently combined into the curriculum and teaching pedagogies. This, henceforth, also underlines the significance of continuing evaluation and modification of instructional resources to guarantee their constant relevance and efficiency.

The study conducted in the countries Uganda and Australia further strengthens the significance of a multifaceted method to augment the academic achievement of the learners. In Uganda, the study emphasized the vital role of instructional tools in addressing the needs of learning needs of diverse learners, putting emphasis on the need for inclusive and manageable educational tools. As to the Australian study, it stressed the significance of integrating the content of learning, the resources, and the pedagogical approaches to craft a consistent and efficient experience of teaching and learning. This holistic method identifies that an instruction that is effective necessitates more than just high-quality instructional materials; it requires a well-organized and thoroughly implemented pedagogical approach that leverages these materials to foster learning in students and empower academic achievement. The results reflect that an effective approach entails in-depth consideration of the progression of learning, ongoing development of skill, and the formation of a supportive environment of learning.

Lastly, the European Union and Louisiana findings reveal the interrelation of teacher training, educational policy, and the quality of instructional resources. The EU study showed that whereas supportive policies at the national level are critical, the efficacy of instructional resources remains a forefront factor affecting the learning outcomes of learners. In addition, the Louisiana study likewise emphasized the need to align the curriculum standards with the practices of teaching, stressing the positive effect on student achievement and engagement, mostly among students who belong to poverty levels. This underlines the essential need for a consistent and integrated method to reforms of education, wherein supportive educational policies are tied with strong training programs for teachers and warrant accessible and high-quality instructional tools.

In conclusion, the consistent result across these varied regions strongly suggests that investing in instructional materials of high quality, together with effective training for teachers and supportive educational guidelines, is vital for augmenting learning outcomes of students and ensuring impartial access to high-quality education for all learners. Future studies should delve into recognizing best practices for upgrading and implementing these instructional materials, as well as discovering the long-term effect of these interventions on the achievement of the students and to equity in education.

## **VI. DISCUSSION**

### **Findings**

Findings highlighted that a compelling constructive connection between the professional development of teachers, high-quality instructional resources, and developed learning outcomes of students across different global countries is evident. It highlights that effective programs and training for teachers are crucial for augmenting the abilities of teachers

to craft and utilize instructional resources, as shown by significantly enhanced student achievement. Additionally, the findings underline the need to align these instructional tools with learning goals and the students' diverse needs while supporting a holistic method that incorporates resources, content, and pedagogies. Similarly, it was found that administrative support and culture-based pedagogies play an essential role in transmitting training into efficient classroom practices.

## VII. CONCLUSION

In conclusion, the constant impactful results show that continued investment in the training of teachers, high-quality resources, and supportive policies in educational settings is essential for enhancing the learning of students and safeguarding impartial access to education with high quality. This study recommends that future researchers delve into classifying best practices for an impactful development and effective implementation of instructional resources and explore the ongoing effects of different models for teacher development on the academic achievement of students and equity in the educational setup.

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