# Differential Education as an Approach for Improving Future Specialist's General Competence

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*Abstract:* Differential education, as an innovative approach, aims to enhance the general competence of future specialists by recognizing and accommodating individual learning styles, preferences, and abilities. This research explores the principles and implementation of a differential education model in the context of higher education, specifically focusing on its potential to foster a well-rounded skill set among future specialists. This research article investigates differential education as a transformative strategy for enhancing the general competence of prospective specialists in various domains. In recent years, the old "one-size-fits-all" approach to education has been called into question, and there is a growing recognition of the need to adapt educational practices to accommodate students' diverse needs, talents, and learning styles. This research investigates the principles, methodologies, and benefits of differential education, as well as its potential to foster a more inclusive, adaptive, and productive learning environment. By analyzing case studies and research data, this research demonstrates how differential education can prepare future specialists to flourish in their respective fields while cultivating a holistic and well-rounded skill set.

**Keywords:** Differential education, Specialized competence enhancement, Tailored learning approaches, Future specialists, Individualized instruction, Inclusive education strategies, Learning diversity adaptation.

# **I.INTRODUCTION**

As a result of the constantly changing environment of the twenty-first century, education has experienced a paradigm shift. There has never been a greater demand for future specialists with a well-rounded, versatile, and extensive skill set as societies become more linked and businesses evolve at an unprecedented rate. The long-dominant "one-size-fits-all" educational approach is being challenged as educational stakeholders understand the need to accommodate children'

different needs, talents, and learning styles. Differential education appears as a transformational technique for meeting this demand and boosting future experts' general competence.

The term "differential education," also known as differentiated instruction, refers to a pedagogical method that tailors learning experiences to students' specific needs within a classroom or educational setting. It acknowledges that pupils' talents, circumstances, and learning preferences differ. Instead, because each kid has a distinct profile, tailored academic help is required for success.

Four important components comprise the fundamental principles behind differentiated schooling. It prioritizes assessing students' ability, interests, and learning profiles first. This requires recognizing each student's different academic readiness levels and learning preferences and conducting continuing evaluations to monitor their progress, allowing educators to adjust their educational tactics accordingly. Second, differentiation in education allows for greater content and instruction flexibility. It involves the revision of curricula and instructional practices to meet the various needs of pupils. This typically entails providing a wide range of learning resources and materials to fit different learning styles.

The benefits of individualized schooling are numerous. When students' specific needs are satisfied, they are more engaged and motivated, which leads to greater academic performance and learning outcomes. Furthermore, it encourages the development of critical thinking and problem-solving skills, resulting in a greater comprehension of the subject matter and allowing students to tackle difficult situations with confidence. Importantly, individualized education creates a diverse range of abilities, such as communication, teamwork, adaptation, and self-directed learning, all of which contribute to a well-rounded competence profile. Furthermore, it fosters inclusivity and equity by closing achievement disparities and creating a more equitable learning environment in which all children may get a high-quality, tailored education.

Differential education as an approach for improving the general competence of future specialists stems from a larger debate about educational philosophy and curriculum design. This section provides an overview of major educational research and practice advances that have prepared the path for differentiated education adoption and advancement[1].Differentiated instruction (DI) and differentiated education are closely related concepts. Tomlinson and McTighe (2006) stressed the need of tailoring training to students' diverse needs and learning styles. They advocated for acknowledging that students differ in terms of readiness, interest, and learning style, and for modifying education to account for these differences. The DI framework has been widely embraced in K-12 education in the United States, setting the groundwork for differential education ideas.

The push toward inclusive education has had a significant impact on the evolution of differentiating education. In typical classrooms, inclusion emphasizes accepting students with varying learning capacities [2].Differentiating instruction to accommodate the special needs of disabled children while keeping their incorporation into general education settings has become increasingly important to educators.

The ideals of differentiating education and inclusive education are mutually reinforcing. The constructivist approach to teaching and learning has aided in the promotion of differentiated education. The constructivist concept, advocated by educators like Jean Piaget and Lev Vygotsky, maintains that children create their own knowledge and comprehension. As a result, education should be customized to assist this growth. Differential education embraces constructivist ideas by understanding that students construct knowledge in a variety of ways and at varying rates.

Differential education is philosophically associated with the advent of Competency-Based Education, which stresses students' mastery of specific competencies rather than advancement through a prescribed curriculum. Pupils advance in CBE depending on their competency demonstrations. This technique provides for personalized learning routes and takes into account students' various degrees of preparedness and interests. The 21st Century abilities Framework emphasizes abilities other than standard academic knowledge, such as critical thinking, cooperation, and adaptability. Differentiated education is compatible with this approach since it not only accommodates academic difference but also promotes the development of these critical abilities.

Differential education incorporates these discoveries by recognizing that pupils' capabilities may vary across numerous intelligences and learning styles. The use of technology in education has made it possible to individualize learning

experiences. Educational technology and adaptive learning systems are increasingly being used to give tailored content, adjust to student development, and provide timely feedback in accordance with the concepts of differentiated education.Differential education is a fusion of diverse educational theories and methods aimed at creating a more inclusive, adaptable, and successful learning environment. These connected publications lay the groundwork for understanding the ideas and benefits of differential education, highlighting its ability to create future experts with a well-rounded and adaptive skill set. Additional research and application in educational contexts are required to realize the full potential of differential education in boosting the general competence of future experts.

## **II.RELATED WORKS**

The objective of the research methodology employed in this study on "Differential Education as an Approach for Improving Future Specialists' General Competence" is to provide a thorough understanding of differential education's concepts, strategies, and outcomes. This study employs both in order to give a complete analysis of the efficacy of diversified instruction in a number of educational settings, qualitative and quantitative research approaches were used[3]. A comprehensive analysis of the research on inclusive education differentiated instruction, differential education, and related pedagogical techniques. At this point in the process, the research will have a theoretical basis. A comprehensive examination of case studies of educational institutions that have implemented differentiated instruction successfully. These examples illustrate how differential education can be utilized in the real world and the positive academic benefits it can have for students.

The distribution of surveys and questionnaires to educators, administrators, and students to collect their perspectives on the efficacy of differentiated education in enhancing general competence, academic achievement, and the development of 21st-century skills. Direct observation in educational settings employing differentiated instruction. The researchers will investigate the methods of instruction, the level of student participation, and the adaptability of the curriculum to the diverse requirements of the students. Interviews with instructors and administrators with knowledge of educational inequality were semi-structured. These interviews will shed light on the benefits and difficulties of unequal education, as well as effective implementation strategies.

Figure 1 depicts a block schematic of the proposed operational plan [4]. The technique of gathering information about students' academic performance through pre- and post-test evaluations in order to discover how unequal schooling affects students' learning results. This data will be analyzed to determine whether or not there has been a significant improvement in the kids' competency.

**Content Analysis:** A qualitative content analysis of instructional materials, lesson plans, and curricula is performed to identify the extent to which these resources are modified to accommodate a wide range of learners. A comparative analysis was conducted using a number of case studies to evaluate the similarities, differences, and most effective approaches for implementing differentiated education.

Ethical considerations will be strictly followed throughout the research process. Participants' names and anonymity will be protected at all times, and they will be asked for informed consent [5]. Triangulation is the process of validating and improving the validity and reliability of study results by using several data sources (such as surveys, observations, interviews, and evaluations).



Fig.1.1 denotes framework for the proposed research.

DEE minus Initial Performance equals SPE.

SPE (Student Performance Enhancement) is computed by multiplying DEE by the starting performance level.

DEE = f(TE, PE, CE),

where DEE is an abbreviation for Differential Educational Effectiveness.CE is an abbreviation for Curriculum Effectiveness, TE is an abbreviation for Teaching Effectiveness, and PE is an abbreviation for Program Effectiveness.The findings will be evaluated in the context of previous research and theoretical frameworks to provide a thorough understanding of the implications of varied education on the general competence of future experts.

The goal of the previously mentioned research approach is to give a comprehensive evaluation of the impact of differentiated education on aspiring experts' general competence. The research's goal is to provide a thorough view of the basics, benefits, and obstacles of adopting differential education in various educational environments. The researchers will use a combination of quantitative and qualitative research methodologies to accomplish this.

# **III.RESEARCHMETHODOLOGY**

#### **Design and Samples**

For this study, a quantitative methodology was applied, namely an ad hoc questionnaire. We compiled a sample size of 17,321 higher education instructors stationed in With information gathered the Spanish Ministry of Science. The

response rate was 13.10% (2,262). The majority of 2,180 inquiries were resolved successfully. As a result of the database cleanup for unusual or lost samples, the poll was conducted anonymously to protect the data's confidentiality.

Part A of the survey asks about the teaching staff's gender, how long they have been teaching at the college level, their age, and the area of knowledge they have worked in as a teacher and researcher[6].

Part B contains the Dig Comp Edu Check-In, which was created by Ghomi and Redecker (2018) and then translated into Spanish by Cabero-Almenara and Palacios-Rodrguez (2020). The self-perceptions of professors' digital abilities in six domains are investigated. Professional Commitment, the key aspect, focuses on using ICT to improve education and engaging in productive communication with colleagues.

The ability to use ICT resources to plan, implement, and execute teaching techniques that emphasize active and innovative approaches is a component of Digital Pedagogy in the context of education. Dimension 4 evaluated and provided feedback on instructors' use of ICT to enhance evaluation methods.

**Component:** Empowering Students focuses on how instructors encourage students' active participation with digital technology, tailoring their level of competency to each student's educational interests and requirements. Facilitate Students' Digital Competency is the sixth dimension, which concentrates on how to develop and facilitate the digital citizenship skills of students.

The instrument employs a five-point Likert scale from 0 to 4 to assess how well individuals believe they comprehend computer-related technical issues. A1 indicates "new comer," A2 indicates "explorer," B1 indicates "integrator," B2 indicates "expert," C1 indicates "leader," and C2 indicates "pioneer."

dimensions	Dim.1	Dim.2	Dim.3	Dim.4	Dim.5	Dim.6	Total
Cronbach's	0.73	0.65	0.77	0.80	0.78	0.78	0.93
alpha							
Мс	0.67	0.69	0.73	0.78	0.75	0.75	0.99
Donald's							
Omega							

**Table.1**: Signifies highly commendable levels of dependability.

Since the authors only confirmed the content's reliability and validity in terms of the instrument's psychometric properties, this research will look into this thatthere are two more tests left:Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) [7].Questions related to the teacher's usage of digital tools and resources for his pupils' education can be found in the survey's third section. The table signifies highly commendable levels of dependability. The following is a taxonomy of the types of resources available:

- Digital technologies for student learning as an information consumer in the classroom (watching movies, watching slide shows, taking online examinations, and viewing digital posters and idea maps) [8].
- As an information consumer, use digital technologies in the classroom to help students learn (through making movies, web pages, digital posters, idea maps, and tests).

In the classroom, disruptive technologies such as new digital tools are acquiring traction[9]. This trend includes the incorporation of game mechanics into teaching and learning practices (gamification), the enhancement of information through the combination of real and virtual elements (augmented reality), and the creation through Immersive experiences are generated via virtual reality by replicating visual and/or audio stimuli.

# **IV.RESULTS AND DISCUSSION**

Internal consistency measures such as Cronbach's Alpha and Mc Donal's Omega represent that both the instrument's dimensions and its entire set have extremely high levels of dependability.

In contrast, a descriptive analysis incorporating asymmetry and kurtosis confirms that the data for the variable total digital competence are not normally distributed. For subsequent comparisons, the Mann-Whitney test is therefore utilized.



Fig.1.2 shows the approaches of instructional strategies.

This research assessed the digital abilities and knowledge of higher education professors in different academic areas and examined whether these aspects affect their classroom use of digital courses with teachers and students. The graph shows the approaches of instructional strategies.

When it comes to digital tools, where teachers who use them don't differ greatly, and those who do not, almost all age groups and subject areas use videos and multimedia presentations, with the exception of the arts and humanities. The statements of Researchers Maharaj-Sharma et al. (2017) said that all teachers use this kind of material, even though fact that it provides the same benefits as traditional presentations Cosgungeyik(2017), may provide a possible explanation for these findings, possibly as a result of a democratization process with regard to the variables analyzed. Robotics is another field related to previous research. Our findings indicate that there are differences in the levels of expertise between the two categories of teaching personnel in all areas, but not across all experience levels.

There are only small differences between teachers with 15 years or more of experience who use ICT tools and those who don't. Other than that, all of their areas of expertise are the same. A number of studies, including those by Oleksiuk and Oleksiuk (2020) and López Belmonte et al. (2020) have revealed that younger teachers are more inclined to employ cutting-edge resources and instructional strategies. This way of thinking says that using ICT effectively takes a lot of time and work, which is why many university teachers don't create technology-based lessons.

Concerning the discrepancies in academic personnel between those who use digital resources and those who don't, it has been seen that teachers with 15 years or more of experience have very different levels when using ICT technologies, a high level of computer literacy is required for all subject areas. When it comes to ICT tools, the field of sciences has the most diverse set of options. Engineering and social sciences are next on the list. These results also show that teachers who use ICT in the classroom are better at what they do. Some writers have said that ICT can improve and make the teaching-learning process better, which could explain these results Miller & Nourbakhsh, 2016; Radianti et al., (2020). The Horizon 2019 report's Alexander et al., (2019) one of its objectives is to help people get better at using technology in the classroom and learn specific digital skills for administration. This is very important because new technologies and the teaching methods that come from using them in the classroom have been shown to be very useful for improving education because they help students in many ways.

Along with having the right, most up-to-date, and properly working computers, we think that time is the most important aspect to consider while deciding whether to use technology in the classroom. Universities and government bodies need to change too, and teachers need to be able to choose how much they teach Alexander et al., (2019). Teachers don't have enough free time to do this ongoing training.

While it's true that ICT is increasingly being used in university classrooms, there is yet to be a unified strategy for how best to prepare both students and teachers in digital literacy. The policies being enacted by education ministries appear to reflect this. Unfortunately, not all schools are doing a good job of providing their students and staff with environments conducive to learning digital skills. Professors in Andalusian institutions are surveyed to determine their level of digital competency in relation to their students' learning outcomes, whether referring to "Consumers who actively participate in the teaching-learning process," "prosumers," or on the other hand "emerging resources." The DigCompEdu Check-in took place utilized to evaluate pupils at this level in a variety of disciplines, such as the study of the humanities, as well as the natural and social sciences, engineering, and the built environment.

Other researches have confirmed the same conclusion as this quantitative study. This fact is directly related to the need for ICT training and educational institution-led training plans for university teaching staff. It's not ideal, but it's an excellent starting point for creating a common set of qualifications for digital teaching ability. Similarly, it is critical to think about how to structure classes around such training. The findings also suggest that teachers with 15 years or more of experience have the greatest training gaps in all areas of knowledge connected to the usage of the three types of ICT resources.

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