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Improving The Methodology of Programmatic and Comprehensive Acquisition of Mechanical Transmissions in the Framework of Innovative, Integrated and Technological Education

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Abstract

This scientific work provides information about the improving the methodology of programmatic and comprehensive acquisition of mechanical transmissions in the framework of innovative, integrated and technological education.

Keywords: *Programmatic Acquisition; Comprehensive Acquisition; Mechanical Transmissions; Innovative Education; Integrated Education; Technological Education; Integrative Approach; Innovative Approach; Educational Technology*

Introduction

According to the Decree of the President of the Republic of Uzbekistan No. PD–5847 dated October 8, 2019, the "Concept for the development of the Higher Education system of the Republic of Uzbekistan until 2030" states, "... Drawing from foreign experiences, this proposal advocates for the implementation of advanced standards in higher education. These standards entail a gradual shift from an emphasis on theoretical knowledge acquisition to a pedagogical approach that prioritizes the development of practical abilities" [1].

Priority tasks at the level of state policy have inevitably included the training of exceptionally qualified, competitive, and competent specialists for the real sectors of the economy. Additionally, there is an urgent need to recognize the integration of contemporary teaching and learning processes as a strictly technological endeavor, considering both pedagogical and psychological aspects.

Undoubtedly, the automotive and machine–building sectors, which are prominent and critical divisions of the nation's tangible economy, serve as the most indispensable sources of raw materials and technical support for the advancement of the agro–economy, transportation, construction, and industry, respectively. On the contrary, the engineering and automotive sectors could not exist in the absence of contemporary machinery.

Indeed, machines possess utility through their mechanical motion, which facilitates the transfer or alteration of energy, materials, and information. Such mechanisms serve to augment the quality and efficiency of work, optimize the production process, manage and refine operations, and even execute certain physiological functions that are traditionally associated with humans. Work–performing artificial structural devices are comprehended.

An apparatus is comprised of three interconnected mechanism groups, each of which executes a distinct function: the drive, the executive, and the transmissions situated between them, in addition to the nodes and details.

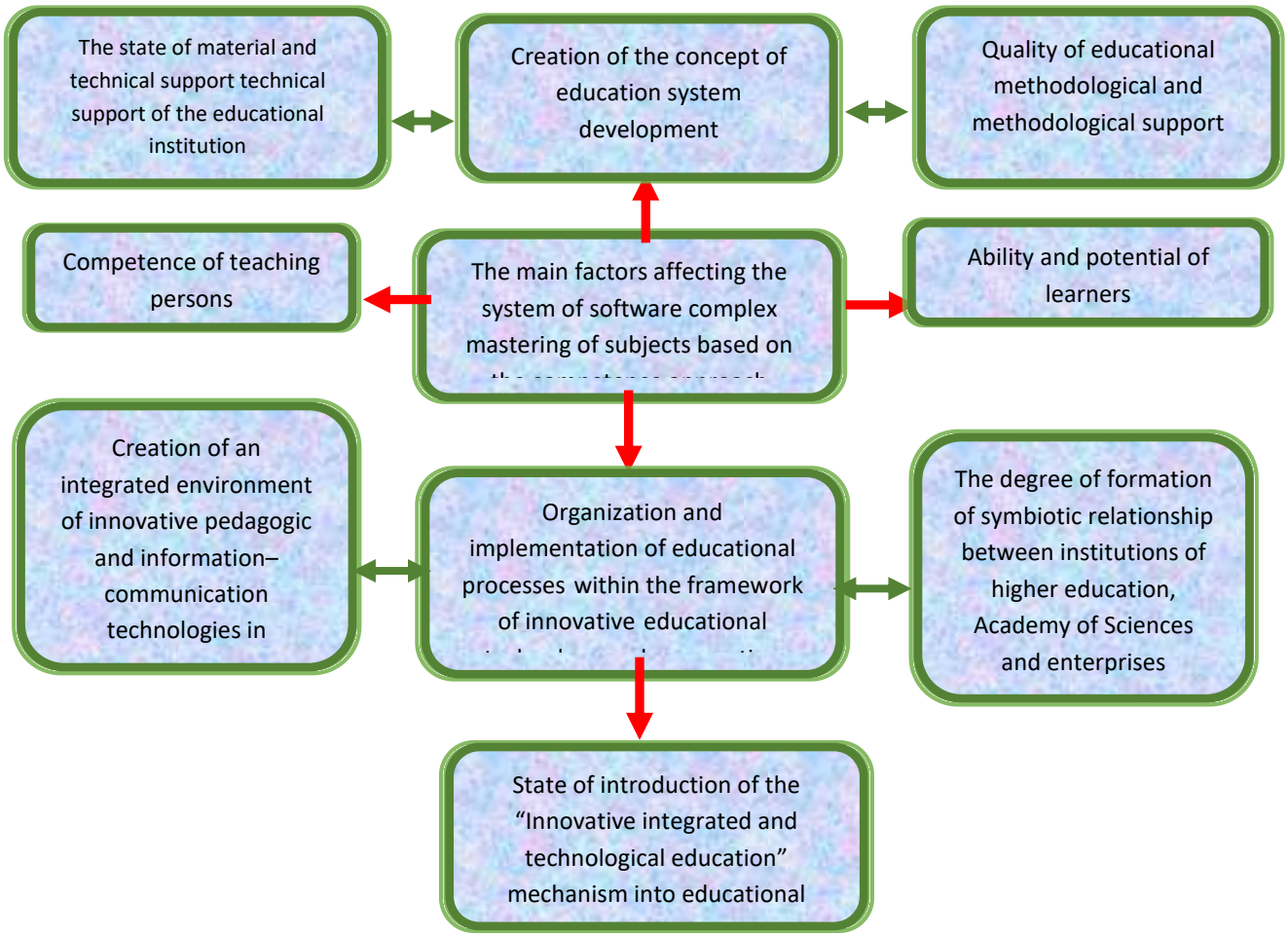
Achieving the following during the design and construction phase of machinery and mechanisms: high efficiency, dependable and cost–effective operation within the designated timeframe; adherence to quality and cost–effectiveness standards; conformity with the principles of constructive succession and modularity (considering practical constructive solutions); each detail should be robust, distinctive, and of the utmost importance [2, 3].

Mechanical transmissions that are prevalent in mechanical engineering are those that are situated between the power source and the machine's working portion. These transmissions connect the two from structural, technological, and mechanical perspectives; facilitate the adaptation of working modes; transfer actions, occasionally converting between different types; and manage and coordinate actions at the necessary level.

Programmatic mastery of learning materials, when viewed through a pedagogical–psychological lens, refers to students' capacity to master specific learning materials in a dynamic sequence.

The process begins with the acquisition and development of understanding, knowledge, and practical skills. This is followed by the consistent execution of tasks and the achievement of desired outcomes. Next, there is a phase of comparing, monitoring, and analyzing the results obtained. Finally, there is a focus on programmatic mastery, which involves the integration of theoretical and practical elements and adherence to the requirements outlined in current state educational standards (SES) or network educational standards (NES).

In consideration of this process, it is imperative to precisely identify the variables that influence the enhancement of the software–complex acquisition of engineering graphics, technical mechanics, and machine details through the implementation of innovative integrative and competency–based methodologies (Figure 1).



The system of software–complex acquisition of subjects based on a competent and innovative approach should be progressively enhanced in form and content in the rapidly developing and globalizing information society of the twenty–first century. In extreme circumstances, a radical reform process is an absolute necessity, in accordance with current demands and educational programs and curricula.

The "Literacy and knowledge–skills–competence" unit in the activities of learners will dynamically augment from the specific to the general, practical to specific, and demonstrate competence symptoms in a systematic manner; this can only occur when the educational processes improve in tandem with the societal development trend. Man endeavors for perfection [4, 5, 6, 7], which leads to the gradual development of personal qualities culminating in their mastery. Undoubtedly, the processes of globalization, which are constantly developing in theory and practice, are extremely complex and require continuity, and require adequate equipping and rehabilitation of not only students, but also all participating members of society to act in the socio–political environment, provides tactical–strategic assignments, including training and updates, to ensure performance of operational tasks. In light of the rapid advancements in science and technology, as well as the widespread and rapid exchange of information, it is suitable to approach the two interconnected phenomena that transpire in daily life through pedagogical and methodological lenses.

1. As a result of the transition to the personnel training system at the bachelor's level, the duration of education has been shortened by one year. Moreover, students in all higher technical education institutions (HTEI) are currently enrolled in relevant educational programs with significantly reduced assigned academic loads compared to prior years.

To optimize current educational programs and concurrently enhance the efficacy of scientifically grounded educational methods while concurrently reducing mandatory academic workloads, parallel implementation of contemporary information and communication technologies in educational institutions, homes, and independent study is necessary. Put simply, the era indicates that educational processes have transformed into distinct technological processes. However, it is not a secret that certain professors and instructors who do not utilize modern pedagogical and information technologies have significantly reduced their teaching loads in comparison to previous years. Despite their numerical deficiencies, these individuals have objected to the "complexity" of the curriculum, which they claim to have "lost". They contend that it is more practical to cover the required study hours by passing lessons in a manner that does not condense information, but rather expedites it. Particularly in the cases of educators who neglected or paid little attention to the homework–doing process within the context of independent education, educational processes fail to produce guaranteed outcomes.

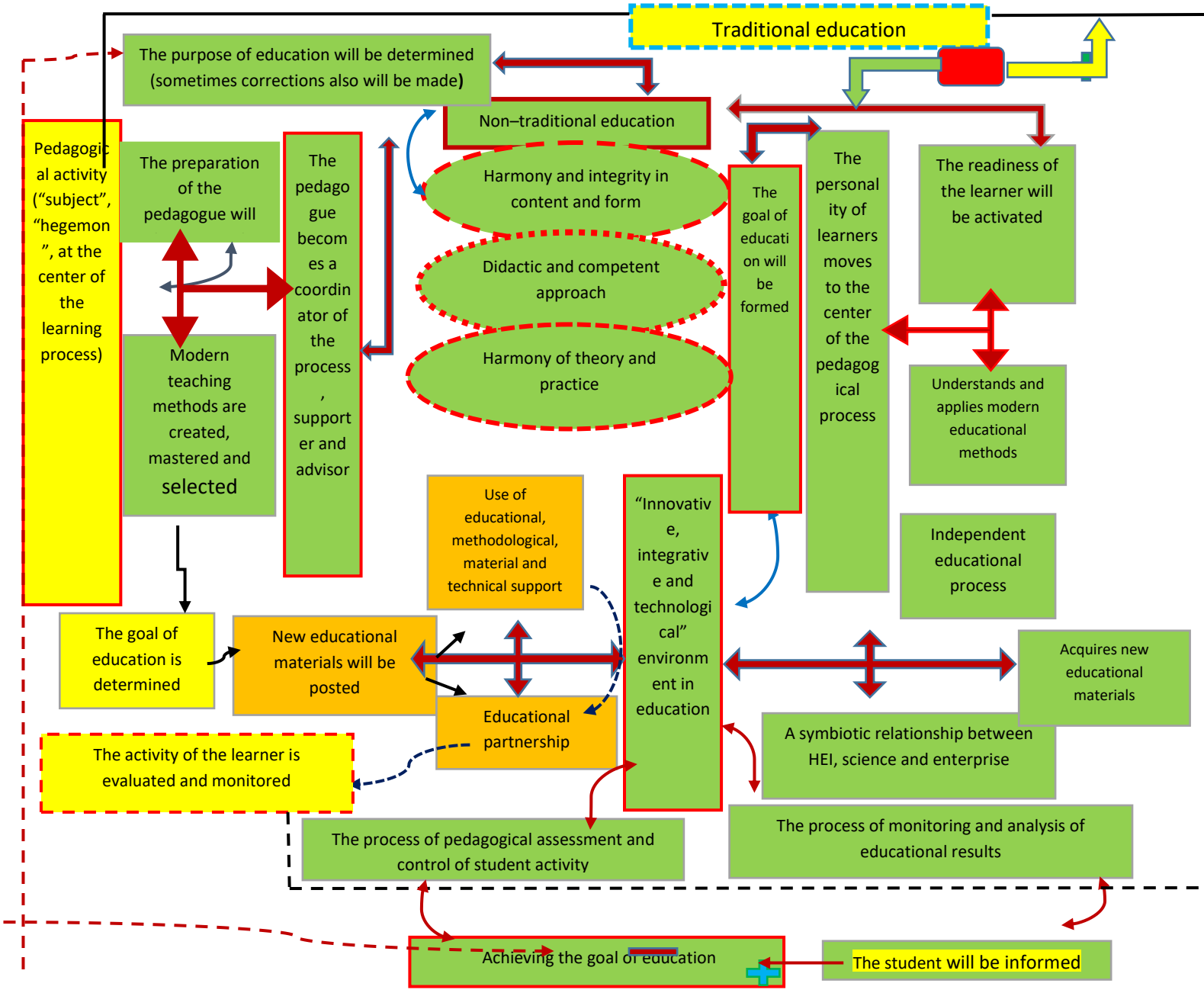
While it is indisputable that these methods are completely erroneous, it is still imperative that innovative technologies be implemented in educational processes in order to resolve the scientific–pedagogical issues that are awaiting resolution. Alternatively stated, it is imperative to acknowledge that the present curriculum mandates that the implementation of innovative approaches to educational processes and the system of competence be regarded as both a prerequisite and a sufficient condition for the program–complex mastery of all subjects. Failure to do so will result in an incomplete guarantee of the current SES and NES requirements being implemented.

2. As an integral component of globalization processes, the emergence of "Stagnation of innovative development" places the responsibility of devising an ideal model for transforming the educational process on the shoulders of the administrations of numerous nations. This initiative aims to address the challenge of producing proficient and credentialed personnel capable of fulfilling the demands of an innovative economy.

To achieve greater success in implementing these processes, it is crucial to begin with educational institutions where the interactive method is an essential component of the person–oriented (non–traditional) educational technology system. Additionally, the mechanism of "Innovative–integrative and technological education" should be fully operationalized and implemented in order to enhance the quality and efficiency of education while also fulfilling the demands of the direct competence approach. Person–oriented (non–traditional) educational technologies are predicated on research, collaborative activity, and modeling models of learning. Primarily through these models, the pupil–student personality is prioritized in the pedagogical process, and conducive environments are established to facilitate his growth and actualization of his innate potential. In light of the recognition that educational technology is a key element within a comprehensive framework encompassing educational, methodological, material–technical provisions, the educational process, and the learners themselves, it is evident that educational technology holds significant importance in the endeavors of educators and learners. In this regard, the authors put forth a distinctive, all–encompassing model that integrates both traditional and non–traditional educational technologies, aiming to achieve a harmonious and cohesive approach. The user's text is already academic. No rewriting is necessary (Figure 2).

Additionally, it is crucial to establish and cultivate a mutually beneficial relationship between HTEI, scientific research, and manufacturing, taking into account both immediate and long–term needs. In the current era of rapid scientific and technological advancements, there is a pressing need to cultivate an autonomous educational process in Ottm. This necessitates the establishment of an "Education–science–production complex" that is built upon a system centered around the utilization of "knowledge through science" technologies. Additionally, it is crucial to enhance the innovation–integration mechanism between these components [8, 9].

Figure 2. The mechanism of programmatic and comprehensive acquisition of __



Now, let us examine the circumstances under which the model of the "Mechanism of programmatic–complex assimilation of educational–cognitive materials" might primarily facilitate the integration and coherence of both conventional and unconventional educational methodologies.

The fundamental nature and core components of this model are indicated by the "Goal–process (tool)–result" framework, which encompasses both traditional and non–traditional educational technologies in order to achieve a comprehensive educational Trinity. These general aspects include didactics, educational content and form, as well as quality and efficiency [10].

Furthermore, it substantiates the correlation between guaranteeing the seamless and uninterrupted provision of education, aligning theoretical concepts with practical applications, and adhering to educational standards. This correlation is intricately linked to various factors, including the endeavors of contemporary educators, the availability of material, technical, and educational resources, and the methodology employed in the field of education.

It is widely recognized that the traditional lesson transition model effectively conveys the intended objective of the lesson. However, the set of assignments or tasks mostly caters to individuals who have been trained in a pre–algorithmic fashion. The actions of individuals who engage in educational pursuits with the intention of acquiring knowledge are subject to pedagogical influence, and the process of education is typically implemented with an implied obligation. In essence, the conveyance of knowledge is characterized by passivity, hence constraining learners' capacity for autonomous critical and logical thinking. This model employs many instructional methods, including lectures, interactive question and answer sessions, and hands–on practical exercises. The lecture method is founded around the presentation of substantial quantities of educational and cognitive content in a unidirectional manner during a designated timeframe. The educator must possess the ability to effectively showcase professional competencies in the areas of scientific expertise, educational proficiency, public speaking, and psychological acumen, while also demonstrating accurate situational evaluation.

The foundation of the personality–oriented education system is in the mechanism of "Innovation–integration and technological education", which is specifically aligned with the demands of a competency–based approach. Simultaneously, this educational technology prioritizes research models of modeling, collaborative activities, and learning in its content and essence. Furthermore, in the organization, implementation, and even educational management of the educational process, the student's personality is placed at the center of the pedagogical process. This approach aims to create favorable conditions for the student's development.

It is important to acknowledge that the attainment of guaranteed outcomes in educational processes may not always be realized. In order to address this, it is crucial to establish or comprehend the objective of re–education, make necessary adaptations to the implementation of collaborative activities, and persistently pursue the process until the desired outcomes are assured.

The model proposed by the authors demonstrates its essence and significance through two main aspects. Firstly, it addresses the use of authoritarian and personality–oriented teaching techniques in the context of continuing education, with the aim of enhancing the effectiveness of its modernization and implementation. Secondly, it emphasizes the importance of harmonizing different educational methods in order to facilitate the educational processes.

Conclusion

In conclusion, it can be inferred that, based on the findings of this research, it is evident that the utilization of personality–oriented educational technologies holds significant importance in the development of competitive and highly skilled individuals in the field of "enhancing the methodology of software–complex mastery of mechanical transmissions within the context of innovation–integration and technological education" amidst the process of globalization.

1. The enhanced integration of conventional and unconventional educational technology has led to improvements in the model's substance and importance.

2. The acquisition of applicable software–complex mastery procedures.

3. The primary elements that define the software–complex mastery system in the fields of engineering graphics, technical mechanics, and machine details are based on innovation–integration and competency approaches.

4. The presence of the "innovation–integration and technological education" mechanism, which aligns with the competency approach, plays a crucial role in fostering a cohesive educational environment and promoting personality–oriented educational processes.

5. The importance of giving careful consideration to the gradual development and enhancement of practical skills and qualifications within the technical, professional–technical, higher education, and professional education system is regarded as a multifaceted undertaking. The necessity to undertake educational reforms in order to address this matter has been substantiated from both a scientific–pedagogical and psychological standpoint.

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