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Pedagogy is a term that refers to the method of how teachers teach, in theory and in practice. Pedagogy is formed by an educator's teaching beliefs and concerns the interplay between culture and different ways to learn. In order to help students to build on prior learning, meaningful classroom relationships must exist. Pedagogy refers to the study of teaching approaches and how they affect learners. A carefully considered pedagogy is essential in enabling students to learn more effectively and can help them develop high-order thinking skills. There are four common forms of pedagogy: social (education as supporting social development), critical (deconstructing normative perspectives), culturally responsive (encouraging the sharing of diverse backgrounds and experiences) and Socratic (developing intellectual and social skills to live in a democratic society).

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Research Article

CRAFTING FUTURES: A HOLISTIC LEARNING ANALYTICS APPROACH TO ELEVATE WRITING SKILLS IN YOUNG CHILDREN

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ABSTRACT

This research delves into a holistic learning analytics approach aimed at enhancing writing skills in young children. Titled "Crafting Futures: A Holistic Learning Analytics Approach to Elevate Writing Skills in Young Children," the study explores the integration of technology and pedagogy to foster a comprehensive learning environment. Through the analysis of learning analytics data, this research seeks to illuminate the intricate dynamics of children's writing development, offering insights for educators, parents, and policymakers to nurture literacy effectively.

KEYWORDS

Learning Analytics; Writing Skills; Young Children; Literacy Development; Holistic Approach; Educational Technology; Pedagogy; Early Childhood Education.

INTRODUCTION

In the evolving landscape of early childhood education, the integration of technology and pedagogy has become pivotal in shaping foundational skills. This research embarks on a transformative journey, encapsulated in the title "Crafting Futures: A Holistic Learning Analytics Approach to Elevate Writing Skills in Young Children." The study unfolds at the intersection of educational technology, early literacy development, and the dynamic realm of learning analytics.

The Significance of Early Literacy:

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Early literacy lays the groundwork for a child's lifelong learning journey. Writing skills, in particular, serve as a gateway to expression, creativity, and critical thinking. Recognizing the pivotal role of writing in cognitive development, this research adopts a holistic perspective, aiming to enhance writing skills in young children through a fusion of pedagogical strategies and cutting-edge learning analytics.

The Promise of Learning Analytics:

Learning analytics, a burgeoning field in educational technology, offers a unique lens into the learning process. By harnessing data-driven insights, educators and stakeholders gain a nuanced understanding of individual learning trajectories. In the context of young children's writing skills, learning analytics provides an unprecedented opportunity to tailor interventions, track progress, and cultivate a supportive learning environment.

Crafting Futures as a Holistic Approach:

The title encapsulates the essence of our approach—crafting futures through a holistic lens. This entails a multifaceted exploration, incorporating technological tools, evidence-based pedagogy, and a keen understanding of the diverse needs and capabilities of young learners. By embracing a holistic perspective, we aim to not only elevate writing skills but also foster a love for language, creativity, and self-expression.

Objectives of the Research:

Exploring Learning Analytics Dynamics: Uncover the intricacies of learning analytics in the context of young children's writing development, examining patterns, challenges, and opportunities.

Pedagogical Integration: Investigate the seamless integration of learning analytics tools into pedagogical practices, ensuring a harmonious balance between technology and traditional teaching methods.

Tailoring Interventions: Leverage learning analytics data to tailor interventions that cater to individual learning styles, preferences, and challenges in the realm of writing skills.

Informing Educational Practices: Provide insights and recommendations for educators, parents, and policymakers on leveraging learning analytics to nurture early literacy effectively.

Navigating the Research Landscape:

As we embark on this holistic journey, we envision a future where every child's potential is nurtured, and the foundations of literacy are solidly crafted. Through the exploration of learning analytics dynamics, the seamless integration of technology and pedagogy, and the tailoring of interventions, we aim to contribute valuable insights to the broader discourse on early childhood education.

The chapters that follow unfold the layers of Crafting Futures, offering a comprehensive exploration of our approach, findings, and recommendations. It is our hope that this research resonates not only with educators and researchers but also with parents and policymakers invested in shaping a future where young children flourish as confident and articulate writers.

METHOD

The process of crafting futures through a holistic learning analytics approach unfolds as a dynamic and iterative journey, guided by careful planning,

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collaboration, and a commitment to the developmental well-being of young children.

Establishing Collaborative Partnerships:

The journey commences with the establishment of collaborative partnerships with preschools and early childhood education institutions. Building strong relationships with educators, parents, and guardians is essential to create a supportive environment for participant recruitment and engagement. This collaborative foundation ensures that the study aligns with the needs and values of the educational community.

Participant Recruitment and Informed Consent:

A diverse sample of young children is recruited with the support of educational partners. Parents or guardians are provided with clear and comprehensive information about the study, and informed consent is obtained before their children's participation. The emphasis is on transparency, ensuring that all stakeholders understand the purpose, benefits, and potential impacts of the research on their children.

Selection and Integration of Learning Analytics Tools:

Careful consideration is given to selecting age-appropriate and engaging learning analytics tools. These tools are seamlessly integrated into the existing early childhood education curriculum, ensuring that they enhance rather than disrupt the learning environment. The collaboration with educators is pivotal in aligning the tools with pedagogical goals and learning objectives, fostering a cohesive integration of technology and traditional teaching methods.

Data Collection and Analysis:

The data collection process involves a combination of passive data capture through learning analytics tools and active data collection through observational methods. Quantitative metrics related to writing skills are collected in real-time, providing a continuous stream of data. The subsequent analysis, both quantitative and qualitative, forms the heart of the research, uncovering patterns, challenges, and opportunities for intervention.

Tailoring Interventions and Pedagogical Adjustments:

Drawing insights from the data analysis, interventions are tailored to address specific writing skill challenges and capitalize on strengths identified in the learning analytics data. The collaborative refinement process involves ongoing discussions with educators to make pedagogical adjustments that optimize the integration of learning analytics tools. This iterative approach ensures that interventions evolve in response to the dynamic needs of the young learners.

Ethical Considerations and Stakeholder Communication:

Ethical considerations are woven into every step of the process. Regular communication with stakeholders, including educators, parents, and participants, ensures that ethical standards are maintained, and participant well-being is prioritized. Transparency in reporting findings and maintaining participant confidentiality is integral to the ethical conduct of the research.

Continuous Monitoring and Feedback Loop:

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The process includes continuous monitoring of the learning analytics tools' impact on writing skills and the overall learning experience. A feedback loop with educators and parents provides valuable insights that contribute to the ongoing refinement of interventions and data collection methods. This iterative approach ensures that the research remains responsive to the evolving needs and dynamics within the educational setting.

Through this comprehensive and collaborative process, "Crafting Futures" seeks not only to elevate writing skills in young children but also to contribute to the broader dialogue on the effective integration of learning analytics in early childhood education. The journey unfolds with a commitment to shaping futures where young learners flourish as confident, expressive, and creative writers.

RESULTS

Quantitative Insights:

Quantitative analysis of learning analytics data provided valuable insights into the writing skills development of young children. Metrics such as writing frequency, vocabulary usage, and milestone achievements were tracked. The data revealed distinct patterns, allowing for a nuanced understanding of individual progress and group dynamics. Comparative analyses across demographic factors contributed to a comprehensive view of the impact of the learning analytics approach.

Qualitative Findings:

Qualitative analysis, derived from observational methods and interactive activities, added depth to the quantitative insights. Themes related to writing engagement, creativity, and emotional responses emerged, offering a holistic understanding of the children's experiences. Qualitative data provided context to the quantitative metrics, shedding light on the intricacies of writing skill development in the early childhood context.

DISCUSSION

The discussion delves into the intersection of learning analytics, pedagogy, and early childhood development. It interprets the quantitative and qualitative findings within the broader context of educational practices and theories. Insights from learning analytics are discussed in relation to traditional pedagogical approaches, emphasizing the complementary nature of technology-enhanced learning. The discussion explores how tailored interventions based on learning analytics data can address individual needs and foster a positive writing environment.

The qualitative findings contribute depth to the discussion, highlighting the emotional and creative dimensions of young children's writing experiences. The role of educators, parents, and the learning environment in shaping these experiences is discussed, drawing connections between the qualitative themes and established educational theories. The discussion also addresses challenges encountered during the implementation of the holistic learning analytics approach and proposes strategies for overcoming them.

CONCLUSION

In conclusion, "Crafting Futures" demonstrates the potential of a holistic learning analytics approach to elevate writing skills in young children. The

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convergence of quantitative and qualitative insights provides a comprehensive understanding of the impact of technology-enhanced learning on early childhood development. The tailored interventions, informed by learning analytics data, showcase the potential for individualized support in writing skill development.

The study's findings contribute to the evolving discourse on the integration of learning analytics in early childhood education. The discussion emphasizes the collaborative nature of the research process, involving educators, parents, and young learners. "Crafting Futures" stands as a testament to the possibilities of shaping positive educational futures through the thoughtful integration of technology and pedagogy.

The research concludes with a call for continued exploration, refinement, and adaptation of learning analytics approaches in early childhood education. By acknowledging the dynamic nature of young children's learning experiences, educators and researchers can collaboratively craft futures where every child's unique voice is nurtured, and the foundations of literacy are solidly established.

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Research Article

BRIDGING STRENGTH AND STABILITY: ANALYZING BALANCE AND ISOKINETIC STRENGTH IN FEMALE VOLLEYBALL PLAYERS

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ABSTRACT

This research presents a comprehensive examination of the interplay between strength and stability in female volleyball players, with a focus on balance and isokinetic strength. Through meticulous analysis, we explore the intricate relationship between these two crucial components, shedding light on how they collectively contribute to the athletic performance and injury prevention strategies of female athletes in the dynamic context of volleyball. By employing advanced measurement techniques and a multidimensional approach, this study aims to deepen our understanding of the nuanced connections between balance and isokinetic strength, providing valuable insights for training programs and performance optimization in female volleyball.

KEYWORDS

Balance, Isokinetic Strength, Female Athletes, Volleyball Players, Performance Optimization, Injury Prevention, Athletic Training, Biomechanics, Sports Science, Multidimensional Analysis.

INTRODUCTION

In the demanding world of volleyball, where agility, precision, and explosive power intertwine, the dynamic equilibrium between strength and stability holds paramount importance. This research endeavors to delve into this intricate interplay, focusing

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specifically on the examination of balance and isokinetic strength in female volleyball players. Termed "Bridging Strength and Stability," our study seeks to unravel the nuanced connections between these essential components, aiming to enhance our comprehension of how they collectively shape the athletic prowess and injury resilience of female athletes engaged in the fast-paced and physically demanding realm of volleyball.

Female volleyball players undergo rigorous training regimens to master the diverse skills required for success on the court. While strength is a cornerstone of performance, the significance of stability, particularly in the form of balance and isokinetic strength, cannot be overstated. This research acknowledges the dynamic nature of volleyball, where rapid changes in direction, explosive jumps, and sudden decelerations necessitate a harmonious integration of muscular strength and neuromuscular control.

Through a comprehensive analysis, we intend to bridge the gap in our understanding of how balance and isokinetic strength synergistically contribute to the overall performance and injury prevention strategies of female volleyball players. Employing advanced measurement techniques and adopting a multidimensional approach, this study seeks to uncover the biomechanical intricacies that underlie the exceptional athleticism observed on the volleyball court.

As we embark on this exploration, we aim to not only expand the scientific understanding of the physiological dynamics at play but also contribute practical insights for the development of targeted training programs. By elucidating the relationship between strength and stability in female volleyball players, we aspire to provide a foundation for tailored interventions that optimize performance and mitigate injury risks in this elite cohort of athletes.

METHOD

The process of bridging strength and stability in the analysis of balance and isokinetic strength in female volleyball players involved a systematic and multidimensional approach. Firstly, a meticulously selected cohort of elite female athletes actively engaged in competitive volleyball was assembled, ensuring a representative sample with significant volleyball experience and minimizing confounding factors related to injury history.

The participants underwent a comprehensive assessment of isokinetic strength using a cutting-edge dynamometer. This involved standardized tests targeting key muscle groups relevant to volleyball performance, such as the quadriceps and hamstrings. These tests provided objective measures of muscle strength, power, and endurance, capturing the dynamic aspects of muscle function under varying loads and velocities encountered in the sport.

The balance evaluation was conducted using a sophisticated force plate system coupled with three-dimensional motion analysis. This assessment included both static and dynamic balance tests, such as the Modified Clinical Test of Sensory Interaction on Balance (mCTSIB) and the Y Balance Test. The goal was to gain insights into participants' neuromuscular control, postural stability, and ability to maintain equilibrium during the dynamic movements inherent in volleyball.

Furthermore, a biomechanical analysis was employed to capture the intricacies of movement patterns during volleyball-specific tasks. Three-dimensional motion capture technology, synchronized with force plate data, facilitated a detailed understanding of joint angles, limb kinetics, and overall biomechanical

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efficiency during actions like jumping, landing, and lateral movements. This approach allowed for a holistic exploration of how isokinetic strength and balance factors contribute to the biomechanical performance of female volleyball players.

Finally, statistical analyses were applied to interpret the quantitative data obtained from the assessments. Descriptive statistics, paired t-tests, and correlation analyses were conducted to identify patterns, significant differences, and relationships between variables. The statistical outcomes played a crucial role in elucidating the complex interactions between isokinetic strength and balance in the specific context of female volleyball performance.

This multidimensional and systematic approach not only ensures the robustness of the investigation but also provides a comprehensive understanding of the intricate relationships between strength and stability in the unique biomechanical demands of female volleyball. The insights gained from this process contribute to the development of targeted training interventions aimed at optimizing the performance and well-being of female athletes in competitive volleyball.

Participant Selection:

A carefully curated sample of elite female volleyball players, actively participating in competitive leagues, was selected for this study. Criteria for inclusion involved players with a minimum of three years of competitive experience, no recent history of musculoskeletal injuries, and consent to participate in the comprehensive assessments. This stringent participant selection ensures a cohort representative of high-level performance and minimizes confounding factors related to injury history.

Assessment of Isokinetic Strength:

Isokinetic strength assessments were conducted using a state-of-the-art dynamometer. The participants performed a series of standardized isokinetic strength tests focusing on key muscle groups relevant to volleyball performance, such as quadriceps and hamstring muscles. These tests provided objective measures of muscle strength, power, and endurance, capturing the dynamic nature of muscle function under varying loads and velocities.

Balance Evaluation:

Balance assessments were carried out utilizing a force plate system coupled with three-dimensional motion analysis. Participants underwent a battery of tests designed to evaluate static and dynamic balance, including the Modified Clinical Test of Sensory Interaction on Balance (mCTSIB) and the Y Balance Test. These assessments allowed for a comprehensive understanding of the participants' neuromuscular control, postural stability, and ability to maintain equilibrium during dynamic movements common in volleyball.

Biomechanical Analysis:

A sophisticated biomechanical analysis was employed to capture the intricacies of movement patterns during volleyball-specific tasks. Three-dimensional motion capture technology, synchronized with force plate data, provided a detailed insight into joint angles, limb kinetics, and overall biomechanical efficiency during actions such as jumping, landing, and lateral movements. This approach facilitated a holistic understanding of how strength and stability factors contribute to biomechanical performance in female volleyball players.

Statistical Analysis:

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Statistical analyses were conducted to interpret the quantitative data gathered from isokinetic strength assessments, balance evaluations, and biomechanical analyses. Descriptive statistics, paired t-tests, and correlation analyses were employed to identify patterns, significant differences, and relationships between variables. The statistical outcomes were crucial in elucidating the complex interactions between isokinetic strength and balance in the context of female volleyball performance.

Through the integration of these comprehensive methodologies, our study aims to bridge the gap between strength and stability by providing a nuanced understanding of the intricate relationships within the unique biomechanical demands of female volleyball. This multidimensional approach not only ensures a robust investigation but also contributes valuable insights for tailored training interventions aimed at optimizing the performance and well-being of female athletes in the realm of competitive volleyball.

RESULTS

The comprehensive analysis of balance and isokinetic strength in elite female volleyball players yielded insightful results. Isokinetic strength assessments revealed notable strengths and potential areas for improvement in key muscle groups critical to volleyball performance. The balance evaluations, encompassing both static and dynamic components, unveiled the nuanced neuromuscular control and postural stability exhibited by the athletes. Biomechanical analyses provided a detailed understanding of movement patterns during volleyball-specific tasks, highlighting the interplay between isokinetic strength and balance in dynamic actions.

DISCUSSION

The discussion revolves around the intricate relationships between isokinetic strength and balance observed in female volleyball players. Notable findings include the correlation between specific muscle strengths and dynamic balance during volleyball-related movements. The biomechanical analysis illuminated how well-developed isokinetic strength contributes to optimal movement patterns, emphasizing the significance of balance in maintaining postural stability during dynamic actions. The discussion delves into the practical implications of these findings for tailored training interventions aimed at optimizing both strength and stability in female athletes.

Moreover, the discussion addresses the potential implications for injury prevention, as a deeper understanding of the relationships between isokinetic strength and balance can inform strategies to mitigate injury risks associated with the dynamic nature of volleyball. The findings contribute to the growing body of knowledge in sports science, providing valuable insights into the multifaceted aspects of physical conditioning necessary for high-level performance in female volleyball players.

CONCLUSION

In conclusion, the study successfully bridges strength and stability by analyzing balance and isokinetic strength in female volleyball players. The results underscore the interconnected nature of these components, revealing how well-developed isokinetic strength contributes to optimal balance and biomechanical efficiency in the context of volleyball-specific movements. The comprehensive insights gained from this research have implications for the refinement of training programs tailored to the unique physiological demands of elite female volleyball players.

This study not only advances our understanding of the nuanced relationships between strength and stability

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but also offers practical applications for enhancing performance and minimizing injury risks in female athletes engaged in competitive volleyball. As the sporting landscape continues to evolve, these findings contribute to the ongoing dialogue in sports science and athletic training, fostering a holistic approach to optimizing the physical capabilities of elite female volleyball players.

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Research Article

THE IMPORTANCE OF THE LIBRARY IN YOUTH EDUCATION

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ABSTRACT

The article discusses the role of the family and the activities and duties of adults in the development of reading skills in young people, the formation of reading culture in young students. In modern higher education institutions, the main tasks of introducing young people to fiction are shown.

KEYWORDS

Youth reading, reading skills, Utkir Hashimov, Alisher Navoi, reading literacy.

INTRODUCTION

Today, higher education institutions pay special attention to the development of reading skills of young people, the formation of reading culture in students, and the formation of the reading culture of students based on a systematic approach. At the same time, pedagogical conditions for development of reading skills among students of all educational institutions, improvement of the organizational-integrative model, development of interactive technologies for education of interest in reading are gaining relevance.

PD-5953 dated March 2, 2020 of the President of the Republic of Uzbekistan approved the Strategy of Actions on the five priority directions of the development of the Republic of Uzbekistan in 2017-2021 as "The Year of Development of Science, Enlightenment and Digital Economy "The decision of the Cabinet of Ministers to ensure the implementation of the State program:

"to translate the best examples of national and world literature, to improve the culture of reading, to develop the culture of reading in remote areas of the republic and for the age group;

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simplifying the procedures for organizing book trade, improving the system of delivery of newly published books and distribution of information sources;

adapt book suppliers to modern social needs, improve infrastructure, fill information and library centers with printed publications and their electronic copies, create e-books, digitize books and create electronic catalogs and systematically update them;

systematic study of the population's level of reading and interest in books, organization of projects and contests aimed at developing the culture of reading, increasing the potential of librarians;

tasks such as ordering foreign works online, bringing them to the territory of the republic and expanding international cooperation on the development of reading culture and the system of distribution. This requires clarifying the theoretical methodological bases of the formation of reading skills in young people, developing criteria for evaluating the level of formation of reading skills, and determining the stages of formation of reading skills in young people.

LITERATURE ANALYSIS AND METHODOLOGY

The issue of increasing the interest of young people to study is gaining importance today. Along with increasing the interest of young people in reading books, "reading literacy" is also improved. When reading fiction books, students read a text filled with events, places of events, images, consequences, characters, the atmosphere of the work, feelings and ideas and enjoy the language of the text. In order to understand and appreciate literature, every reader needs to think about the events, emotions, language, and artistic form of the text. Literature provides an opportunity for young readers to discover situations and emotions that they have not yet experienced.

Although the events, actions, and fictional events depicted in the work of art are imaginary, they make the reader imagine that they are happening in real life and allow the reader to experience them in their imagination. A text (or a work of art) can tell the narrator or his main character what he is going to do in the future. More complex texts may require more perspective or tension. The idea of the text, the information in it, is described directly or in the form of dialogues and events. In short stories, works, events are usually told in chronological order. The play is told by going back to the events and going back in time.

The problems of forming qualities such as reading and book-loving in students are considered to be very important problems, and this problem is interpreted as connected with intellectual education and knowledge acquisition in the teachings of folk pedagogy, Islamic literature, and great thinkers. Abu Nasr Farabi, Abu Rayhan Beruni, Abu Ali Ibn Sina, Yusuf Hos Hajib, Kaikovus, Ahmad Yugnaki, Abdurrahman Jami, Alisher Navoi, Zahiriddin Muhammed Babur, and later Abdurauf Fitrat and other's educational and ethical views are evident in the book and his thoughts on learning can be evidence.

DISCUSSION

People's writer of Uzbekistan Utkir Hoshimov has already established himself in the hearts of fans with stories, novels and deep stories such as "Spring does not return", "Work of the world", "There is light, there is shadow", "Between two doors", "Life in a dream" took place. Mixing reality with the truth of life, describing the inner world of the heroes of the work perfectly, accurately and accurately in every way, and being able to convince the reader is the main point of Utkir Hashimov's work. In the short stories included in this collection of the writer, the subtle aspects of human destiny and thoughts have found their artistic

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expression. In the topics written under the "Thoughts" column, the morals, morals, spiritual world, national values, and the injustices of the Shura era are boldly covered, and the topics invite every conscientious person to debate. Comic stories full of humor and resounding laughter bring a sweet smile to the reader's lips while exposing the unpleasant vices in marriage. The writer dreamed that "... write a book so that the reader who reads it forgets everything, lives the life of the heroes of the work...". Today, reader's worldview is enriched through these works. Factors of modern reading The main tasks in introducing young people to fiction in educational institutions are as follows:

- Arousing interest in studying fiction among young people, starting from groups.
- Cultivating in young people the desire to listen to fairy tales, stories, narrative poems and similar examples of artistic works, to understand them, to carefully observe the development of events, to reflect on them, to form an assessment of the actions of the heroes of the work.
- To answer questions about the content of the work, to describe the actions of the heroes of the work, to describe their spiritual forgiveness and spiritual qualities, to teach them to correctly evaluate.
- To have a basic understanding of the genres and language of the work, to understand the idea of the work, visual means in an age-appropriate manner, to teach to express one's views and opinions.
- By narrating a work of art, narrating its content, and reciting a poem expressively, understanding the tone of speech, voice strength, pauses and expressiveness, forming compliance with it.

The main goal of youth reading is to encourage young people from a young age

Educating in the spirit of humanity, honesty, truthfulness, justice, and beauty is to serve them to become true human beings.

THE RESULT

In the words of Hazrat Alisher Navoi, "Not educating a capable person is tyranny, and educating an incompetent person is a shame." Don't spoil your education and destroy it, don't waste your education on it." We can achieve positive results if we start the process of forming young people's interest in books from the family, and if we continue to cooperate with the family in higher education organizations, we can achieve effective results. The role of the family is incomparable in the development of young people's interest in books and art, the richness of speech, and the development of listening skills. The great Russian writer L. N. Tolstoy did not express his opinion for nothing that "The essence of the book is eternal, This essence - eternalizes thinking." If a parent in a writer's family is familiar with books and often reads books, newspapers, and magazines, a child growing up in this family will also love books. Such young people have a broad outlook, a large vocabulary, and fluent speech. In the future, they will grow up to be intelligent and well-rounded. The development of reading skills in youth higher education institutions is carried out together with the sphere of speech-communication, reading, writing skills and the sphere of creative development. In the course of educational activities, it is necessary to take into account the age and individual characteristics of young people in the thematic planning of fairy tales. In higher education institutions, fiction is inextricably linked with the development of speech.

CONCLUSION

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Our main goal is to raise the reading culture to a level comparable to that of developed and actively developing countries, and to raise the percentage of young people who are reading and actively reading. Currently, the percentage of young people participating in promotional events to promote reading among young people is increasing. Problems of development of reading culture in the field of education, methods of scientific study and promotion, are considered as a matter of state importance today, and measures are being developed. The main task of the library is to educate young people who are worthy of the future of our country, creating a solid foundation for the future of the young generation to become a mature and spiritual person.

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Research Article

DEVELOPING STUDENTS' CREATIVE RESEARCH AND PROFESSIONAL SKILLS THROUGH CRITICAL THINKING

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ABSTRACT

This article provides students with creative research and professional skills and the content of developing skills through critical thinking, innovative technologies of education robotics, modeling, constructivism, critical thinking in teaching programming the importance of ability and the process of its formation are discussed.

KEYWORDS

Research, robotics, professional skills, critical thinking, logical thinking, gathering information, disposition.

INTRODUCTION

From the achievements of science and innovation activities in the world education system wide use, consistent with all spheres of society and state life sustainable development of the country's decent future is becoming an important factor. USA, Russia, England, South Korea, Japan in countries like, competitive with high technological readiness personnel training is considered as the main direction of development, innovations in education, including robotics, modeling, design, programming, 3D design and virtual theoretical studies are being conducted on teaching engineering.

Continuous education system formed in the Republic of Uzbekistan the process of training a competent person and a qualified specialist is effective serves to ensure its organization. Continuous education system in non-school educational institutions operating within STEAM subjects, critical thinking, and independent information seeking and analysis special emphasis on the development of competences and skills taking into account the requirements of the modern digital economy. Today's tasks are to answer the problems of personnel training is becoming one. Today, he is a well-rounded person in the process of extracurricular

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education, social education outside of school that the order is not aligned with advanced foreign practices and the need to update the educational content; modern information individual children through the wide use of communication technologies programs and methodical materials aimed at development, students the development of vocational training is sufficient lack of security; of knowledge and skills acquired by students to the level of skills and qualifications required in professional activity inconsistency determines the relevance of the researched problem.

STEAM in improving students' vocational training by applying learning to practice, students research and professional skills can be enhanced. Innovative technologies for skill development are widely used the need to teach critical thinking, students as a means of developing research and professional skills is being considered.

What is meant by teaching students to think critically? What is critical thinking? Critical thinking is information refers to the ability to objectively analyze and draw reasonable conclusions. This such as data, facts, observable phenomena, and research findings includes resource evaluation. Critical thinking is the analysis of evidence to draw conclusions. Rational, skeptic, unbiased arguments in complex topics and objects

There are several different types, including analysis and evaluation

are definitions. Critical thinking is the student's self-management, self-discipline, self-control and self-development on thinking. These are strictly perfect conditions and use them wisely implies. It is effective communication and problem solving abilities, as well as local egocentrism and sociocentrism undertakes to overcome.

Taken by students during class and extracurricular activities the training sessions are often research-oriented in this case, the student's independent movement, the assignments given to him and the logical thinking of the student in finding their solution. Developing and guiding critical thinking is always a challenge remains. Today, in the modern world, training for a profession training is carried out on the basis of a one-way approach, several new professions were created, such as IT specialist, robotics, mechatronics and engineering professions. These professions in learning and performing complex technological processes and operations students' programming, assembly, implementation, commissioning and technological sequencing skills alone are not enough; research skills are also gaining importance.

For this case, students are required to regularly develop critical thinking is being done. World experience shows that during education most in the development of students' skills and abilities. In addition to skills and abilities, researchers also consider critical thinking are admitting. This includes dispositions of this concept. The origin is critical in research conducted in 1985. The ability to think is different from the ability to "do and accomplish". The concept of critical thinking ability is recognized corroborating empirical evidence also emerges, and the deductions are in fact characteristic of individual objects has been proven. These opinions are different. Attitudes are cast as habits. The scientist Facione defines critical thinking situations as follows: "To persons, events and conditions attitude towards è is constant to react to them are internal motives that arise. Researchers are similar develop critical thinking by trying to identify sets based on several reasons and factors. For example, most often an ability that

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involves repetitive critical thinking situations types are as follows:

- open thinking ability;
- the ability to think fairly;
- the ability to tend to look for reasons;
- the ability to be curious;
- the ability to want to be informed;
- adaptability;

Today, several western scholars Facione, Ennis, Baylin and many in identifying critical thinking on the part of others although studies have been carried out by most researchers that critical thinking involves "skills and judgments." are agreeing. His perspective on critical thinking. In 1990, they are coming to the conclusion that it is necessary to consider. The American Philosophical Association (APA) is critical of a compromise future research by forming a group of like-minded researchers the task of identifying critical thinking that supports their actions. Although most experts believe that dispositions are an important component. Agreeing that it is a part, they oppose certain actions believed to be dispositions within the definition of critical thinking, some simply play a praiseworthy role based on these considerations and that others who support these views also have a normative role counts. Students can develop their research and professional skills in the right ways.

There are several ways to teach critical thinking engineering circles can teach the following:

1. Gathering information:

Many of our readers are completely wrong they make decisions because they believe their opinion is right. Such a reason they make mistakes is that they have little information on the contrary, it does not seek to further strengthen knowledge. Therefore, considering how fast our times have progressed collect all available information and analyze them.

2. Follow up:

Here's how curious the readers are. Always not paying attention to what is under our eyes and it's because we take them for granted. Besides that, not only objects, but our behavior and others, are different having ironic situations and unusual structures of mechanisms possible. When we observe, our inner feeling is unconscious for a while and that our eyes do not react to what we see.

3. Working with literature:

We use logic to make the right conclusion you have to learn. It has its own laws, exceptions, and controversies. There are objections, but nevertheless, our opinion in any discussion. It is a great way to prove that other students learn to notice inconsistencies in their statements and if the situation allows react to them.

4. Rationalization:

This means applying the laws of consciousness: induction, deduction and analogy. Using these tools, we can argue we can evaluate it and find its strengths and weaknesses.

5. To remember:

Regularly one step away from the details of the problem to go back and remember the whole process and what we learned and paying attention to how we experience it.

6. Creativity:

It helps us not only to understand the essence of creativity, but also

helps to be more creative through exercises. Using methods such as TRIZ and STEAM, they help us approach problems systematically.

7. Sorting and sequencing:

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Analyzing information, the elements and ideas for learning according to their characteristics and sort out. Usage of mental capabilities.

8. Compare and contrast:

Two or more objects, situations, learning to identify how problems are similar and different. Make a list of advantages and disadvantages and then choose one.

9. Cause and Effect Analysis:

Interestingly, many students they cannot distinguish cause and effect. Therefore, our first our step will be the ability to determine cause and effect. Sometimes the reason and the effect may not be related to each other, so we have something we may not have considered.

10. Synthesis:

Different to achieve an unexpected result collect data and integrate them.

11. Assessment:

Learning to find two or more solutions to a problem and evaluating which one is better.

12. Prediction: This is a complex process that does not bother students.

They spend a few seconds "analyzing" and into the future based on which they make decisions. Do not do this, pay attention to the data gather scientific solutions by collecting and analyzing with. There are thousands of factors that we can take into account.

13. Priority:

Learning to manage time, why our time understanding what we spend and what it is spent on. Don't forget that time spent on useless things can lead to loss of work efficiency.

In conclusion, this skill is usually summative and final consideration. We should know that everything is clear what we understood, what experience we gained, what conclusions to know what we have released and to summarize it all learning to do. Most likely, students will learn these skills at the same time cannot master. However, we use these to make better decisions and we can generalize them to act boldly. A mastered skill significantly affects the students' way of thinking can change the level.

There are different ways of thinking, but none of them not as effective in problem solving as critical thinking. With the help of critical thinking which we raise emotional awareness and emotional level, as well as our prevention of cognitive distortions and egocentrism possible.

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Research Article

PEDAGOGICAL CONDITIONS FOR DEVELOPMENT OF PRACTICAL AND CREATIVE SKILLS OF STUDENTS IN "ENGINEERING COMPUTER GRAPHICS"

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ABSTRACT

In this article, one of the best ways to implement the integration of engineering and computer graphics as pedagogical problems with specialized subjects is the technology of improving the teaching of educational materials based on modern graphic programs. A number of proposals have been made regarding the problems of teaching engineering and computer graphics, as well as optimal solutions for achieving quality education. Theoretical solutions for teaching engineering and computer graphics are presented.

KEYWORDS

Design, skill, interdisciplinary, intellectual-creative process, computerization, computer graphics, creativity, practical-creative skill.

INTRODUCTION

In the concept of development of the higher education system until 2030, "formation of educational programs in accordance with the interests of students and the needs of personnel customers through the development of curricula based on individual educational trajectories, aimed at the formation of creative thinking and practical skills in students, important tasks such as introducing methods and technologies aimed at strengthening competencies, directing the educational process to the formation of practical skills. This, along with increasing the quality of professional training of future specialists, creates the need to develop their independent practical and creative skills.

Modern reality, the changes taking place in society require changing the model of any specialist. One of the important tasks of the transition to the credit-module system in the higher education system of our

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republic is the organization of independent work of students. Independent work as a form of educational activity in accordance with the requirements of the state standard of the higher education system is an integral part of the educational process. Independent and meaningful work of students in accordance with the state educational standard, work programs created for academic subjects, tools for providing classroom teaching: textbooks, study guides and methodical guides, educational and software packages, etc. is determined.

RESEARCH METHODOLOGY

It is analytically reasonable to study the level of development of teaching competence (scientific and scientific-research, production-technological, design-constructive, experimental-research skills, skills) of the subject "Engineering and computer graphics" during the period of conducting the research attention is paid to For this, the criteria for this case study are based.

They consist of:

1. Possession of theoretical knowledge and graphic competence qualities.
2. Ability to design using computer graphics, quickly create products.
3. Ability to freely create a design-constructive product based on alternative (computer) programs (technologies).
4. Ability to create design and construction products using digital technologies.

Based on these criteria, the following indicators of mastering knowledge, skills, qualifications and design qualities were determined.

LITERATURE ANALYSIS

In our research, we look at interdisciplinary integration as a pedagogical problem and investigate the development of professional competencies in the students of 60712500 - Vehicle engineering (automotive transport) on the basis of the integration of "Engineering computer graphics" and "Specialization" subjects. Because the need to implement interdisciplinary integration aims to create a person who is knowledgeable, independent and creative in all aspects.

According to Abduqudusov O.A., the integrity of the material world, the unity of theory and practice, the change and development of the universe, society and thinking are the methodological basis of interdisciplinary integration. The psychophysiological basis of interdisciplinary integration comes from the nature of human thinking, that is, thinking. Because interdisciplinary integration makes it possible to learn new aspects of the studied objects and serves as a basis for the formation of knowledge, skills and abilities, as well as personal qualities, which are wide and deep in scope, and in essence, in the form of an integrated system [11].

Since the issue of interdisciplinary integration is one of the general aspects of improving the educational methodology, during our research we identified the following as the main difficulties in the implementation of the integration of "Engineering computer graphics" and "Specialization" subjects: the use of uncoordinated concepts and expressions; lack of separation of main ideas, theories and concepts from the educational material; the internal relevance of scientific knowledge, that is, the fact that knowledge is not logically complete, is not taken into account; Dispersion of academic subjects, their content is not connected and they are not studied consistently.

According to V.N. Fedorova, "Interdisciplinary integration is the reflection of such dialectical interactions that are objectively practiced in nature in the content of academic subjects and are studied by

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modern science, therefore, interdisciplinary integration is considered as the equivalent of interdisciplinary communication. it should be taken into consideration." V.N. Maksimova describes interdisciplinary integration as "a systematic didactic phenomenon that has a certain structure, structure, functions and ways of implementation in the entire pedagogical process." And A.V. Usova considers that "interdisciplinary integration is considered as a reflection of the interrelationships between science directions and the integration of science with production, which objectively exists in the content and methods of teaching from an epistemological point of view."

ANALYSIS AND RESULTS

60712500 of higher educational institutions – the total volume of the educational load, classroom hours and independent study hours for the training of bachelor-teachers in the direction of education in the field of vehicle engineering (automotive transport) change is given. From the analysis of Table 1, it can be seen that the hours of independent education in the curricula of the 60712500 - Vehicle engineering (motor transport) course compared to the total hours are 40.7% in the 2017-2018 academic year, 2018-2019 and 2019 - 43.9% in the 2020 academic years, 51.8% in the 2020-2021 and 2021-2022 academic years, and 54% in the 2022-2023 academic year. In the 2017 curriculum, 40.7% of the hours allocated for independent education are allocated to the total educational hours, in the 2022 curriculum it is 54%, the difference is 13%.

The analysis of the organization of students' independent work shows that the increase in the share of independent education in the current curriculum will help students develop their practical and creative skills by directing them to work independently and engage in creative activities in the information environment. means directed.

Table 1

60712500 – Changes in the amount of hours in the curriculum of the vehicle engineering (automotive transport) course

The year the curriculum was approved	Total hours of study	Auditorium hours	Hours of independent study	Share of independent education
2017-2018	7344	4352	2992	**40,7%**
2018-2019	6588	3690	2898	**43,9%**
2019-2020	6588	3690	2898	**43,9%**
2020-2021	4980	2400	2580	**51,8%**
2021-2022	4316	2080	2236	**51,8%**
2022-2023	5400	2482	2918	**54%**

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The transition to new curricula and programs with a simultaneous reduction in the hours allocated to classroom training has predetermined an increase in the share of independent work of students in the study of many departments and topics of academic subjects. and requires the search for new approaches to organizing their educational activities, not only monitoring their knowledge, but also improving the independent work process, effective organization.

As determined in the Decision No. 824 of the Cabinet of Ministers of the Republic of Uzbekistan dated December 31, 2020 "On measures to improve the system related to the organization of the educational process in higher education institutions", teaching is "credit In the "module system" the study load is divided into 40 - 50% classroom hours and 50 - 60% independent working hours.

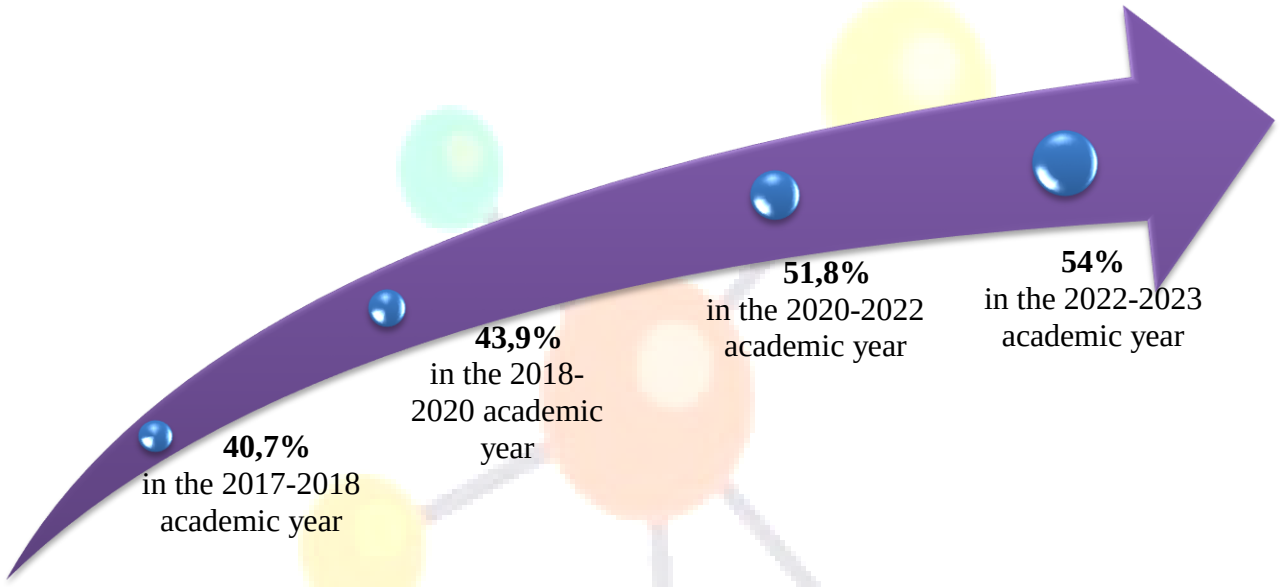

Figure 2.4. 60712500 - Increase of independent study hours in the curriculum of the vehicle engineering (automotive transport) department

60712500 – The subject "Engineering computer graphics" in the curriculum of the field of vehicle engineering (motor transport) is planned in the Block of General Professional Sciences, and is mainly planned for 4-5 semesters. Changes in classroom and independent study hours of "Engineering computer graphics" subject over the years are presented in Table 2.

Table 2

Changes in classroom and independent study hours in the subject "Engineering computer graphics" over the years (in the 2022-2023 academic year)

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Course	Total hours of study	Auditorium hours					Independent education	
		Total	Lecture		practical		Alloted hour	% of total study hours
			Alloted hour	percentage of study hours, %	Alloted hour	percentage of study hours, %		
1 course	180	90	16	9%	**74**	**41%**	90	**50%**
2 course	156	78	18	11.5%	**60**	**38.5%**	78	**50%**
3 course	180	90	30	16.7%	**60**	**33.3%**	90	**50%**
4 courses	128	68	26	20.3%	**42**	**32.7%**	60	**47%**

60712500 – If we analyze the distribution of classroom training and independent training of the subject "Engineering computer graphics" in the direction of vehicle engineering (motor transport), in the 1st and 3rd courses of the 2022-2023 academic year, the general hours are 180 hours, of which the share of independent education is 90 hours, or 50%, the total hours of science in the 2nd year are 156 hours, of which the share of independent education is 78 hours, or 50%. The total hours of the 4th course "Engineering computer graphics" are 128 hours, of which the share of independent education is 60 hours or 47%.

Independent education of students on the basis of the credit-module system is considered an integral component of educational and methodical activities, and is the individual performance of theoretical and practical tasks based on the time limit set for the skills and qualifications that students need to acquire.

In our study, the variation of the hours allocated for practical training in "Engineering computer graphics" of the 60712500 - Vehicle engineering (automotive transport) course section is shown in Figure 2.2.

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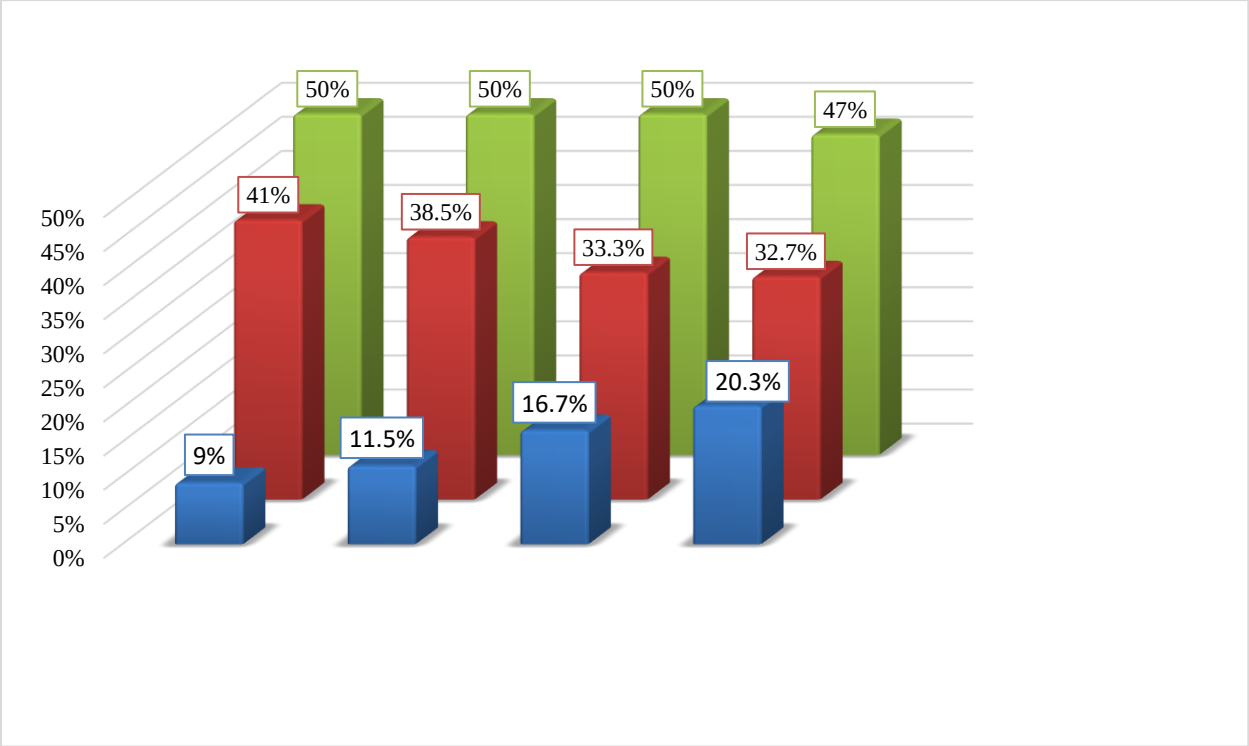

Figure 2. 60712500 – Changes in study hours in the field of vehicle engineering (automotive transport) in the section of courses

If we analyze the change of the hours allocated for lectures and practical training in the graph by the courses, in relation to the total hours allocated for science in 4 courses, lecture training accounted for 20.3%, practical training for 32.7%, 3 16.7% of lectures in the course, 33.3% of practical lessons, 11.5% of lectures in 2 courses, 38.5% of practical lessons, lectures in 1 course compared to the total hours allocated for science training is 9%, practical training is 41%. It is known to us that in practical lessons, students are required to independently perform the assigned tasks based on their theoretical knowledge under the supervision of the teacher, to approach the process of the task creatively, which is the basis for the formation of practical and creative skills in students.

It consists of forming the mental and scientific potential of students, developing students' creative skills through independent work, systematic analysis of assignments and tasks, ensuring independent work of students, and developing methodological support of science for students to work independently. In addition, teachers are required to have an individual approach to each student and direct the student to independent education.

The analysis of scientific and methodical literature and our own pedagogical practice allow us to highlight typical difficulties in organizing and conducting independent education of students.

CONCLUSIONS AND SUGGESTIONS

Based on the analysis of literature, scientific research, we came to the conclusion that it is appropriate to direct our research to the development of creative

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abilities of students in the process of independent education.

First of all, based on the sequence of the process of developing students' creative abilities, to determine the main approaches to the development of students' creative abilities to the independent learning process, and to determine the pedagogical and organizational conditions for the development of student's creative abilities, to develop a model and methodology for developing student's creative abilities we define conducting research work as the main task.

In order to determine the necessity of teaching the science of engineering computer graphics, it is appropriate to study and analyze a number of research works of foreign and domestic scientists, the educational direction of technical higher education institutions, and the content of the science of engineering computer graphics we determined;

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Research Article

THE ROLE AND IMPORTANCE OF APPLIED-DECORATIVE ART IN THE SYSTEM OF PREPARING STUDENTS FOR THE FIELD OF ART STUDIES

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ABSTRACT

This article covers the content and essence of the features of the technologies for the development of professional competence through applied-decorative art in the system of preparing students for the field of art studies.

KEYWORDS

Didactic, graphic, competence, art education, professional, innovation, art-aesthetic, competence, retrospective.

INTRODUCTION

Integration processes in World educational institutions are being tamed high technologies, models of large-scale implementation of innovations. In particular, the development of the field of artistic creativity in the perspective of training creatively thinking specialists on each aspect, the introduction of technologies corresponding to the practice and needs of art education, the development of reasoning competencies based on art studies in the priority areas of didactic tasks of educational disciplines taught in the field of fine and Applied Arts, in the system of training of future teachers of Fine Arts in the field of art studies, the content and mokhatit of the features of technologies for the development of professional competence of Uzbekistan through folk applied and decorative arts, the educational process in the training of future teachers of Fine Arts, along with the acquisition of professional knowledge and skills, practical work on the basis of art.

Improving the models of the formation of competence in the field of folk applied and decorative art of Uzbekistan in the system of training of future visual

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arts teachers in the field of art studies in the world education system. In particular, special attention is paid to scientific research on improving pedagogical mechanisms for the development of professional competence in future teachers, improving socio-pedagogical technologies for the formation of competency in art studies, ensuring the harmony of artistic-aesthetic experience, improving pedagogical mechanisms for the development of artistic creativity as the basis of figurative thinking.

In recent years, in our republic, as in all spheres of society, improvement of the content and methodology of teaching visual art, in particular, its art history laws, and the purposeful study of foreign experiences are being created. "Today, we are moving to the path of innovative development aimed at radically renewing all spheres of state and community life. It's not for nothing, of course. Who wins in today's fast-paced world? A country that relies on new ideas, new ideas, and innovation will win," said the veteran. It defines the conceptual directions of the pedagogical possibilities of developing professional competences of future teachers in the system of training future fine arts teachers in the field of art science and folk applied and decorative arts of Uzbekistan.

The analysis of the literature in the field of folk applied and decorative arts of Uzbekistan in the system of training future fine arts teachers in the field of art studies shows that the study of folk applied and decorative arts of Uzbeks was before the revolution from the period until now. A number of scientists and art critics, such as Sanobar Shodiyeva, Mahmud Usmanov, Polat Zohidov, Anvar Ilhomov, Saidkasim Usmanov, O'tkir Tokhirov, O'tkir Obidov, Qabul Kasimov, Saidakbar Bulatov, are engaged in the research of folk decorative art. who have contributed immensely.

The research results of the above-mentioned authors in the field of art studies are presented in the form of scientific articles, booklets, albums, brochures, monographs and art collections. In these works, Uzbek folk decorative art is interpreted in the aspect of art history. However, the issue of using folk art in the system of training future teachers in the field of art studies has not been studied.

It is necessary to redefine the content of teaching the applied and decorative arts of Uzbekistan, to prepare the students of the field of fine art and engineering graphics in the field of art science. Success in preparation for the field of art studies depends to a large extent on the educational goals, tasks and technology set in the lectures and practical sessions of the special science (Applied Decorative Arts) program.

In the process of teaching this subject, first of all, it is necessary to pay attention to the ability of future teachers to teach in general secondary schools, to organize conversations about fine arts and decorative works. . Accordingly, the goal of preparing students for the field of art studies was determined based on the materials of folk applied and decorative arts of Uzbekistan. Systematic formation of the following knowledge among students was noted as the main task:

- collection of information about types of applied and decorative arts;
- technique and technology of production of applied and decorative art samples, ergonomics of products;
- types of flowering through pattern elements;
- the style of pattern types reflecting the animal world;
- mastering the methods that reflect the forms of external reality;
- arts and crafts;

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- information about the owners of professions and folk craftsmen.

The work of preparing future teachers for the field of art through the means of Uzbek folk applied and decorative art covers the following tasks:

- the history of the development of applied and decorative art;
- types of applied and decorative arts;
- art of painting;
- the art of carpet making;
- leather, wood, metal processing art;
- preparation of ceramics, earthenware;
- Arts and crafts of Uzbekistan.

The inclusion of questions about the history and types of national applied art, the school of folk crafts in the applied and decorative art teaching program at the Faculty of Graphic Arts will further strengthen the knowledge of applied art of future teachers, and prepare them for future pedagogical activities prepares

The problem of studying "the history of the development of applied and decorative art of Uzbekistan" occupies a special place in the work of preparing students for the field of art studies. This problem arises due to the difficulty in determining the artistic value of the objects produced by applied and decorative arts, and showing the time and place of their creation. For example, "Cauldron", "Lamp with winged lions", "Lamp with purple and man" belonging to VI-VIII centuries; Ceramic vessels belonging to the XVI-XVIII centuries; This is clearly visible in the analysis of practical objects such as stone sculptures created in the 19th century.

The ancient decorative art developed in harmony with architectural monuments. Many architectural monuments of Uzbekistan are decorated with patterns of various types, for example, mausoleums in Samarkand, Bukhara, Khiva, Shahrisabz, Termiz, and Tashkent.

Based on the study of the method of using the image of animals as a decoration, students will gain an understanding of the uniqueness of this art form and the impact of changes in the social system on its development. A variety of products produced through folk decorative art: carpet weaving, textiles, pottery products; in the process of getting to know clothes, clothes, home furnishings, tools, jewelry, etc., the imagination of students about Uzbek applied and decorative art will expand even more.

In order to further enrich student's ideas about the technology of development of applied and decorative art products, during the teaching of this subject: advantages of carpet weaving, ball weaving, cloaks, belts, ornaments, carvings, chests is analyzed. In practical sessions, students make sketches of items such as carpets, rugs, bedclothes, hair ornaments, table decorations. Rugs, robes, wooden, metal and ceramic dishes are made from sketches.

Folk masters of Uzbek applied and decorative art are invited to lectures and practical training of students. Tourist trips to historical museums, architectural monuments and places of art and crafts in our country of Jonahon are carried out. Many students prepare coursework and thesis projects about the unique methods, origin, history of development, various forms of Uzbek decorative art.

In determining the level of training of future teachers in the field of art studies, the results of in-depth study of Uzbek applied and decorative art and the ability to apply it in practice are taken as a criterion.

The results of the retrospective analysis of the historical sources of art education became the basis for providing clear evidence about the stages of formation and development of the development of art science

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competencies in the pedagogical theory and practice of art education. The issue of teaching art history in the field of fine arts has a very long history. Especially in the fine arts of the Renaissance, composition reached its peak in terms of perfection. In this regard, artists such as Leonardo da Vinci, Raphael Santi, and Albrecht Dürer based the laws of composition as well as the practical foundations of these laws in their research, inventions, and visual and creative activities. In this sense, the use of materials related to the history of world fine art in the development of students' art history competencies in higher art pedagogical education is important as a factor of increasing the didactic potential of the educational process in this regard.

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Research Article

TEMPERATURE, TEMPERATURE MOLECULAR-KINETIC INTERPRETATION

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ABSTRACT

This article describes the temperature, the molecular-kinetic system of temperature in detail.

KEYWORDS

Objective, method, atom, nucleus, substance, particle, temperature, heat, equilibrium, thermometer, atmosphere, energy, concentration.

INTRODUCTION

The concept of temperature occupies an important place in the study of thermal phenomena. Temperature is one of the main quantities of molecular physics and thermodynamics. We can tell which one is hotter and which one is colder by sticking a finger in the water in different containers. We say that the temperature of hot water is high, and that of cold water is low. He is also not indifferent to knowing the temperature of the air. Temperature is a physical quantity that quantitatively determines the heat level of a substance.

"Temperature" means "condition" in Latin. When measuring the temperature of the human body, a certain time passes until the heat balance is established between the body and the mercury in the thermometer. After the thermal equilibrium is settled, the thermometer reading does not change. As a result of heat exchange in substances, the equalization of their temperatures is called thermal equilibrium. The temperature in all parts of the system in thermal equilibrium will have the same value.

When two bodies have the same temperature, there is no heat exchange between them. If the temperatures of the bodies are different, heat exchange occurs between the bodies when they touch each other. In this case, a body with a higher temperature transfers

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heat to a body with a lower temperature. Heat exchange continues until their temperatures equalize. For example, pour hot tea from a kettle into a cup and place it on the table. After a certain period of time, its temperature equalizes with room temperature, that is, it reaches equilibrium.

The temperature is measured using a thermometer. Usually, the most widely used thermometer is the mercury thermometer (Fig. 2).

A mercury thermometer contains mercury in its reservoir. As the temperature increases, the volume of mercury in the reservoir expands and the mercury rises through the tube. The scale of the thermometer is graduated, and the temperature can be determined by the height of the mercury. The unit of measurement of temperature is degrees. At normal atmospheric pressure, the melting temperature of ice is taken as zero degrees, and the boiling temperature of water is taken as 100 degrees. This interval is divided into 100 equal parts and each part is taken as 1 degree. "gradus" means "step" in Latin. Such a scale was proposed by the Swedish scientist Anders Celsius in 1742 and is called the Celsius scale.

The temperature measured on the Celsius scale is marked as 0 C and is read as "degrees Celsius". According to the purpose of the thermometer, they are graded differently. For example, water thermometers are calibrated from 00 C to 1000 C, human thermometers from 350 C to 420 C, and air thermometers are usually calibrated from 200C to 500C. In the Celsius scale, the temperature is denoted by the letter t.

Absolute temperature

In life, temperature t expressed on the Celsius scale is mainly used. But in the study of thermal phenomena in substances, a temperature called absolute temperature is used. Absolute temperature is denoted by the letter T. English scientist William Thomson (Kelvin) proposed the absolute temperature scale in 1848. This scale of absolute temperature is called the Kelvin scale. The SI unit is called Kelvin and is denoted by K. The value of the steps of the temperature unit obtained on the Kelvin scale is equal to the value on the Celsius scale. When measured on the Celsius scale, the absolute temperature is found to be -273,150 C. It is T=273.15 K at t=00 C. If we round 273.15 K to 273 K, the formula for switching from the Celsius scale to the Kelvin scale can be expressed as follows: T=t+273 (1)
The relationship between the Celsius and Kelvin scales of temperature is expressed by equation (1). However, the change in absolute temperature ⍰T is equal to the change in temperature on the Celsius scale ⍰t, that is, ⍰T=⍰t. Zero temperature on the absolute scale corresponds to absolute zero. At this temperature, the thermal movement of the molecules of matter stops.

Molecular-kinetic interpretation of temperature

Any atom is made up of matter and molecules. The molecules that make up matter move incessantly and irregularly. When the substance is heated, this chaotic motion becomes more intense. The irregular motion of molecules is called thermal motion. Temperature is a measure of the average kinetic energy of the forward movement of gas molecules. From a macroscopic point of view, temperature is a quantitative measure of thermal state. According to the molecular-kinetic theory, the relationship between temperature and the average kinetic energy of molecules is expressed as follows:

$$E_k = \frac{3}{2}kT \quad (2)$$

In this case, the coefficient k is one of the foundations of the molecular-kinetic theory of gases, Austrian

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physicist L. Boltzmann's constant is called after Boltzmann. Its numerical value is k = 1.38*10-23 J/K. Boltzmann's constant is a quantity that expresses the relationship between a unit of energy and temperature. In the state of thermal equilibrium, the average kinetic energy of the movement of all gas states is the same. At absolute zero temperature, the movement of molecules stops. It was the basic equation of the molecular-kinetic theory of gases

$$p = \frac{2}{3} nE_k \quad (3)$$

If expression (2) is substituted for Ek in the expression, the temperature dependence expression of ideal gas pressure is derived:

$$p = \frac{2}{3} n * \frac{3}{2} kT = nkT \text{ ёки } p = nkT \quad (4)$$

The pressure of an ideal gas is directly proportional to the concentration of gas molecules and its temperature.

Teaching physics requires the teacher to make extensive use of modern didactic methods. Second, the educational process is a complex, evolving, open-ended dynamic and nonlinear system. The main elements of this system are teacher, student, textbooks, teaching method, etc. There is a functional connection between these elements. It is possible to increase the effectiveness of physics teaching by analyzing functional connections, identifying its weak points and eliminating it. For this, the teacher is required to have fundamental knowledge of physics and sufficient knowledge of modern methods of teaching it. Therefore, creating textbooks, educational and methodological manuals, taking into account the modern requirements of the science of physics teaching methodology, is an urgent problem.

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