JOURNAL OF MULTIDISCIPLINARY SCIENCES AND INNOVATIONS
VOLUME 04, ISSUE 10
MOPNTHLY JOURNALS
ISSN NUMBER: 2751-4390
IMPACT FACTOR: 9,08

THEORETICAL FOUNDATIONS OF THE TECHNOLOGY OF MASTERY LEARNING IN THE PEDAGOGICAL PROCESS

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Abstract: The article probe into the mastery learning technology's theoretical underpinnings in the teaching-learning process, analyzing its conceptual framework, methodological approaches, and contributions to modern education in practice. The study indicates that the mastery learning technology to be a formal means for assuring students' success directed by prerequisite knowledge, constant feedback, and sufficient learning time, while at the same time its adoption calls for heavy institutional support and high level of pedagogical expertise.
Keywords: mastery learning, pedagogical technology, individualized instruction, formative assessment, educational standards, learning outcomes

Аннотация: В данной статье рассматриваются теоретические основы применения технологии усвоения знаний в педагогическом процессе, анализируются её концептуальная база, методические подходы и практическое применение в современном образовании. Результаты показывают, что технология усвоения знаний обеспечивает системный подход к обеспечению успеваемости учащихся, делая акцент на предварительных знаниях, постоянной обратной связи и достаточном времени обучения, хотя её внедрение требует значительной институциональной поддержки и педагогического опыта.
Ключевые слова: усвоение знаний, педагогическая технология, индивидуализированное обучение, формирующее оценивание, образовательные стандарты, результаты обучения

Annotatsiya: Ushbu maqolada pedagogik jarayonda o‘zlashtirish o‘rganish texnologiyasining nazariy asoslari ko‘rib chiqiladi, uning konseptual asoslari, uslubiy yondashuvlari va zamonaviy ta’lim uchun amaliy ahamiyati tahlil qilinadi. Natijalar shuni ko'rsatadiki, o'zlashtirishni o'rganish texnologiyasi zarur bilimlarni, uzluksiz fikr-mulohazalarni va yetarli o'rganish vaqtini ta'kidlab, talabalar muvaffaqiyatini ta'minlash uchun tizimli yondashuvni ta'minlaydi, garchi uni amalga oshirish muhim institutsional yordam va pedagogik tajribani talab qiladi.
Kalit so'zlar: o'zlashtirishni o'rganish, pedagogik texnologiya, individuallashtirilgan ta'lim, formativ baholash, ta'lim standartlari, o'quv natijalari

INTRODUCTION

Mastery learning technology is one of the most significant pedagogical innovations of the twentieth century, radically questioning the traditional beliefs about student achievement and educational outcomes. This innovation, which comes from the behavioral psychology of B.F. Skinner, was systematically developed by Benjamin Bloom in the 1960s and was recognized as a solution to the persistent problem of individual differences in learning rates along with the classic bell-curve distribution of academic achievement [1]. The main idea of the technology is that if students are given the right conditions for learning, enough time, and constant help, almost all of them can master the learning objectives. The traditional teaching model, where teachers have a fixed curriculum and all students go through it at the same pace, is not applicable here. Mastery learning on the other hand, insists that time becomes the variable while achievement continues to be constant, thus reversing the conventional educational paradigm. The technology

has deep consequences for current educational systems that deal with issues of equality, standardization, and accountability. Arguments for this particular method focus on the fact that it leads to the majority of students, and not just a small minority, attaining the pre-set learning standards.

METHODOLOGY AND LITERATURE REVIEW

The intellectual underpinnings of mastery learning were progressively elaborated by Bloom through his influential paper on learning for mastery [2]. He categorized the pedagogical technology into several interrelated parts forming the instructional cycle. The foremost step is that the learning objectives are to be stated in the clearest possible terms and to be put into a hierarchical structure, thereby assuring that the more complex content is not only understood but is also built on the lower skills [3]. The next step is that the whole class, all students simultaneously receive the first instruction, usually by means of the traditional teaching methods. Then, the formal tests are given periodically to check the learning and spot the difficulties. The tests are based on the predetermined standards, performance of the student is measured against the set criteria, which is different from the norm-referenced test where the performance is evaluated in terms of peers. Then, according to the testing results, the student is given the corrective instruction via different explanations, more practice, peer tutoring or use of modified learning materials designed specifically to overcome the wrong beliefs and lack of skills [4]. The last thing is that a final test distinguishes if the criteria for mastery have been achieved prior to moving on to the next units.

Present-day scholars have added to the original classification of Bloom and have brought in cognitive and constructivist viewpoints which highlight metacognitive awareness, self-regulated learning, and the social aspects of knowledge construction [5]. Mastery learning studies have mostly shown positive outcomes in terms of student achievement, especially for the underprivileged learners, but the implementation fidelity and contextual factors have a great influence on the results. The continuous feedback that technology provides is in line with current assessment theory, which considers formative assessment not as a separate evaluative process but as an integral part of learning [6]. On the other hand, the critics have expressed their doubt on the practicality of introducing genuine mastery learning in traditional school systems, pointing to the enormous demands it makes on teachers' time, institution's flexibility, and resources.

RESULTS AND DISCUSSION

Theoretical foundations, when analyzed, reveal that the mastery learning technology is composed of several fundamental pedagogy principles which make it different from the traditional ways of teaching. The first principle is related to the very nature of learning: mastery learning completely discards the models based on deficits which hold that poor achievement is mainly due to the students' characteristics, and instead, it points to the importance of the design of instruction in the very malleability of the students' outcomes. This viewpoint illustrates a significant optimism regarding the potential of human learning which, in turn, has great impact on educational equity and teacher expectations. The second principle refers to the feedback and correction being systematically used and regarded as the main mechanisms of learning. Traditional models on the other hand, assessment serves mainly summative and selective functions, but, mastery learning has a different concept on assessment which is that it should be integral to the instructional process, that is, as a way to diagnose which part of the teaching and learning is needing attention. This then gives rise to the continuous cycles of instruction, assessment and remediation wherein each one continues until mastery is finally achieved.

The third principle manipulates instructional variables to address individual differences in learning, instead of accepting variable outcomes. Mastery learning through differentiated

corrective instruction and flexible time allows sets learning needs as varied as those without lowering standards or creating separate tracks that could perpetuate inequities. The theoretical framework also includes motivational aspects, admitting that recurring success experiences boost self-efficacy and intrinsic motivation thereby creating positive feedback loops that help to sustain continued learning efforts. The technology's focus on prerequisite learning and hierarchical organization of knowledge confirms cognitive theories about schema formation and the cumulative nature of learning in many areas. On the other hand, the practical application of mastery learning encounters difficulties that unveil the discord between theoretical ideals and education realities. Continuous flexible time allocation requirement contradicts institutional structures organized around fixed schedules, standardized curricula, and age-graded advancement that are inflexible. The necessity of individualized corrective instruction is hard to maintain in regular classroom situations with a high teacher-student ratio and scarce resources.

On top of that, the efficacy of the technology is heavily reliant on the quality of the learning objectives, assessments, and remediation materials, which in turn necessitates a great deal of pedagogical expertise and time for preparation. The modern-day variations of mastery learning have been trying to overcome the implementation difficulties by introducing technological means such as the use of computers for instruction, adaptive learning systems, and competency-based education systems that offer more individualized support and quicker feedback automatically [8]. These technological innovations still follow the basic principles of mastery learning but they utilize digital tools to simplify the logistical difficulties of individual instruction at a large scale. The debate also points out that the mastery learning technology is linked to the values and the beliefs of the system regarding education because it gives priority to the consistent attainment of the predetermined standards over other possible educational goals like creativity, critical inquiry, or personal interest. This approach to education renders mastery learning particularly suitable for foundational skills and structured knowledge areas, while at the same time making it less applicable to open-ended or exploratory learning situations.

CONCLUSION

The theoretical foundations of mastery learning technology correspond to a perfectly coherent and thoroughly developed pedagogical framework that confronts and even questions the traditional views concerning teaching, learning, and achievement. Mastery learning, by treating time as a variable and achievement as a constant, provides a systematic way of making sure that all students, with proper instructional support and learning opportunities, reach the educational standards set beforehand. The technology's theoretical bases are a blend of behavioral, cognitive, and motivational theories, providing a common ground for curriculum design, instructional methodology, assessment practices, and remediation strategies. Although research evidence mainly supports the effectiveness of mastery learning, especially with respect to disadvantaged students, successful implementation still demands a heavy institutional commitment, pedagogical expertise, and resource allocation which can be hard to maintain in traditional educational settings. Digital technologies contemporary adaptations, however, may provide solutions to the implementation challenges while still staying true to the core principles of the learning process.

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