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IMPROVING THE PERSONNEL TRAINING MECHANISM IN JOINT-STOCK COMPANIES UNDER DIGITAL TRANSFORMATION: A COMPETENCY-BASED AND SKILLS-FIRST APPROACH

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Abstract: The rapid transformation of labour markets, accelerated digitalisation, artificial intelligence, automation and changing business models are fundamentally reshaping the requirements imposed on human capital in joint-stock companies. Under these conditions, traditional personnel training systems based on periodic courses and fragmented professional development can no longer adequately respond to rapidly changing competency requirements. This study develops an integrated organizational and economic mechanism for improving personnel training in joint-stock companies based on competency management, lifelong learning, reskilling, upskilling, digital learning and HR analytics.

The study covers the period 2020–2026 and combines international trends with evidence from Uzbekistan. The methodological framework includes systematic analysis, comparative analysis, dynamic analysis, benchmarking, competency-gap analysis, institutional analysis and conceptual modelling. The empirical and analytical basis of the research comprises data and reports from the World Economic Forum, International Labour Organization, OECD, official statistics of Uzbekistan and relevant regulatory documents.

The results demonstrate that the personnel development system should move from a training-event model towards a continuous skills-development cycle integrating corporate strategy, competency forecasting, skills-gap diagnostics, individualized learning pathways, workplace application, certification, performance evaluation and HR analytics. The study proposes a seven-stage personnel training mechanism and develops a Personnel Training Effectiveness Index to evaluate the economic and organizational outcomes of corporate learning. Particular emphasis is placed on introducing digital competency passports, learning management systems, skills databases, internal talent marketplaces and data-driven personnel development.

The proposed mechanism may improve the alignment between corporate strategy and workforce capabilities, enhance the efficiency of training investments, strengthen internal talent mobility and increase the adaptability of joint-stock companies to technological and structural changes.

Keywords: joint-stock company, personnel training, human capital, competency management, lifelong learning, upskilling, reskilling, skills-first approach, HR analytics, digital transformation, corporate learning.

1 INTRODUCTION

Human capital has become one of the primary strategic assets determining the long-term competitiveness of modern corporations. The transition from industrial production models toward knowledge-intensive, digitally integrated and increasingly automated business systems has fundamentally changed the role of employees in value creation.

Between 2020 and 2026, this transformation accelerated under the combined influence of the COVID-19 pandemic, expansion of remote and hybrid work, rapid development of artificial intelligence, digital platforms, automation, cybersecurity requirements, demographic changes and the transition toward environmentally sustainable business models.

The World Economic Forum estimates that structural labour-market transformation may affect approximately 22% of existing jobs by 2030. About 170 million new jobs may be created, while around 92 million existing roles may be displaced, resulting in a net increase of approximately 78 million jobs. At the same time, nearly 40% of skills currently required in jobs are expected to change.

This transformation does not necessarily imply the disappearance of human labour. Instead, it changes the combination of competencies that organizations expect from employees. Artificial intelligence, big data, cybersecurity and technological literacy are among the fastest-growing technical competencies, while analytical thinking, resilience, flexibility, creativity, leadership and collaboration remain strategically important human capabilities.

According to the World Economic Forum, if the global workforce were represented by 100 employees, approximately 59 would require reskilling or upskilling by 2030. Eleven of these workers may not receive the necessary training. Consequently, workforce development is becoming not simply an HR function but a strategic risk-management instrument.

The challenge is also particularly relevant for Uzbekistan. The World Economic Forum's Uzbekistan profile indicates that skills gaps are among the major constraints to business transformation. Only about 22% of the country's workforce is expected to be upskilled within current roles and another 14% upskilled and redeployed according to surveyed employers, both below corresponding global averages reported in the survey. At the same time, 71% of surveyed employers in Uzbekistan expect improvements in talent retention, demonstrating growing corporate attention to human capital.

The International Labour Organization's 2026 report Lifelong Learning and Skills for the Future further emphasizes that technological innovation, artificial intelligence, demographic change and green transformation require lifelong skills development to become a central component of enterprise and economic development strategies. The ILO particularly stresses that contemporary labour markets increasingly reward combinations of cognitive, socio-emotional, digital and occupational skills rather than isolated technical competencies.

Meanwhile, the OECD's 2026 skills-first framework argues that labour-market institutions and employers need to shift from qualification-centred approaches toward systems that identify, develop, recognize and utilize actual competencies. Around 60% of countries responding to the OECD Trends in Adult Learning Policy Questionnaire reported substantial implementation of policies directing learners and providers toward high-demand skills.

These developments create a particular challenge for joint-stock companies. Unlike small enterprises, large corporations typically possess greater financial and organizational capacity for personnel development. However, their size and hierarchical complexity may create several problems:

- training programmes may become bureaucratic;
- learning priorities may not correspond to strategic competency needs;
- training budgets may be distributed without reliable skills-gap diagnostics;

- educational results may be measured only by training hours and certificates;
- HR data may remain disconnected from productivity data;
- corporate learning may not be integrated with succession planning and internal mobility;
- investments in training may not be evaluated in terms of business outcomes.

Therefore, the research problem is not simply how to increase the volume of training, but **how to transform personnel training into an integrated, measurable and strategy-driven human-capital development mechanism.**

Research objective

The primary objective of this research is to develop theoretical, methodological and practical recommendations for improving personnel training mechanisms in joint-stock companies under conditions of digital transformation.

Research tasks

The study addresses the following tasks:

1. to examine international personnel-development trends during 2020–2026;
2. to identify structural weaknesses of traditional corporate training systems;
3. to investigate the transformation from qualification-based toward skills-first workforce management;
4. to develop an integrated competency-based personnel training mechanism;
5. to propose quantitative indicators for evaluating training effectiveness;
6. to determine opportunities for integrating HR analytics, LMS and competency databases;
7. to develop recommendations applicable to joint-stock companies in Uzbekistan.

Research hypothesis

The research is based on the following hypothesis:

The effectiveness of personnel training in joint-stock companies increases when training decisions are based on measurable competency gaps, integrated with corporate strategy and supported by digital HR analytics, while training outcomes are assessed through employee performance and organizational indicators rather than the number of completed courses alone.

2. LITERATURE REVIEW AND THEORETICAL BACKGROUND

Human-capital theory considers education and professional development as investments that increase individual productivity and economic performance.

However, contemporary workforce-development theory extends the traditional human-capital approach by emphasizing continuous learning, organizational knowledge, dynamic capabilities and competency renewal.

The emergence of artificial intelligence has further strengthened this perspective. Employees increasingly need to learn repeatedly during their careers rather than rely primarily on competencies obtained through initial formal education.

The ILO defines lifelong learning broadly as formal, non-formal and informal learning activities undertaken throughout life for the development of knowledge, skills and attitudes. The organization argues that effective lifelong-learning systems require strong governance,

coordination, financing, digital infrastructure, quality assurance and engagement of employers and social partners.

From the corporate perspective, three concepts are particularly important.

Upskilling

Upskilling refers to increasing an employee's competencies within an existing professional role.

For example:

Accountant → Accountant with advanced ERP and data analytics skills

Reskilling

Reskilling means developing competencies that enable employees to perform a substantially different function or professional role.

For example:

Traditional reporting specialist → Business-data analyst

Cross-skilling

Cross-skilling develops complementary competencies outside the employee's narrow functional specialization.

For example:

Engineer + Project management + Data analytics + Leadership

The combination of these approaches creates a more flexible workforce capable of adapting to technological transformation.

The OECD's recent skills-first framework reinforces this perspective by emphasizing actual competencies instead of formal qualifications alone. Employers play a critical role because they possess direct information regarding changing occupational requirements and can participate in designing, delivering and evaluating training programmes. Around two-thirds of participants in job-related non-formal adult learning reported that employers covered at least part of the training costs.

3. MATERIALS AND METHODS

The study employs a mixed theoretical and analytical methodology.

The following research methods were applied:

- systematic analysis;
- comparative analysis;
- statistical trend analysis;
- benchmarking;
- institutional analysis;
- competency-gap analysis;
- logical modelling;
- synthesis and generalization;
- KPI modelling.

The research period covers **2020–2026**.

The information base consists of:

- World Economic Forum reports;
- International Labour Organization publications;
- OECD research;
- official statistical information of Uzbekistan;
- national legal and regulatory documents;
- corporate human-capital development practices.

Because complete annual statistics for 2026 are not yet available for many indicators, the study uses the latest officially available observations published by 2026 rather than generating artificial estimates.

This distinction is important from the perspective of scientific reliability.

4. RESULTS

4.1. Transformation of the global skills environment

The period between 2020 and 2026 demonstrates a transition from an employment model based largely on stable occupations toward a model based on continuously changing combinations of skills.

Table 1

Key transformation trends in personnel development, 2020–2026

Dimension	Traditional approach	Emerging approach
Main unit of HR analysis	Job position	Skills and competencies
Training frequency	Periodic	Continuous
Training design	Standard programmes	Personalized learning pathways
Primary evidence	Diploma/certificate	Demonstrated competencies
Learning format	Classroom	Blended/digital/workplace
Employee development	Vertical promotion	Vertical + horizontal mobility
Training assessment	Completion rate	Performance and competency change
HR decisions	Experience-based	Data-driven
Talent pool	Static list	Dynamic talent marketplace
Learning technology	Basic e-learning	LMS + AI + HR analytics
Workforce strategy	Recruitment focused	Build + buy + borrow + automate
Main objective	Qualification improvement	Continuous employability and productivity

Source: developed by the author based on WEF, ILO and OECD approaches.

The table indicates that modern workforce development represents a systemic transformation rather than simply an expansion of training.

4.2. International workforce challenges

The World Economic Forum identifies skills gaps as the leading barrier to business transformation, cited by 63% of surveyed employers globally.

This result has significant implications.

A company may possess:

- sufficient financial capital;
- modern equipment;
- advanced technologies;
- market access;

but still fail to achieve strategic objectives because employees do not possess the competencies required to use these resources effectively.

Consequently:

Technology investment without corresponding human-capital investment creates an implementation gap.

The ILO 2026 analysis similarly emphasizes that skills should not be considered individually. Contemporary labour markets value **skill bundles**, particularly combinations of cognitive, socio-emotional, digital and occupational competencies.

This leads to the following transformation:

Single Skill → Skill Set → Competency Portfolio → Organizational Capability

4.3. Implications for Uzbekistan

Uzbekistan's expanding and transforming economy creates growing demand for managerial, digital, engineering, analytical and financial competencies.

Particularly important processes include:

- digital transformation of enterprises;
- modernization of industrial production;
- development of capital markets;
- transformation of state-owned enterprises;
- privatization;
- introduction of international financial reporting;
- ESG practices;
- development of corporate governance;
- expansion of international business operations.

For joint-stock companies, these transformations require competencies extending beyond traditional occupational knowledge.

For example, modern financial employees increasingly require:

financial analysis + IFRS + digital tools + data analytics + strategic communication.

Modern managers need:

leadership + digital literacy + project management + analytical thinking + change management.

Modern production specialists increasingly need:

technical skills + automation knowledge + data interpretation + quality management + safety culture.

The Uzbekistan profile in the WEF Future of Jobs Report demonstrates that national employers also perceive workforce skills gaps as a significant challenge to transformation.

4.4. Key weaknesses of the traditional personnel training mechanism

The research identifies seven systemic weaknesses.

First — reactive training

Training frequently begins only after a competency shortage becomes visible.

A modern system should predict future competency requirements.

Second — weak competency diagnostics

Employees may be assigned to courses based on managerial recommendations rather than measurable skills gaps.

Third — one-size-fits-all programmes

Employees occupying the same position do not necessarily have the same competencies.

Standardized training can therefore generate unnecessary costs.

Fourth — separation between training and performance

Learning results may not be connected to employee KPIs.

Fifth — weak integration with talent management

Training, succession planning, career management and talent pools may operate independently.

Sixth — insufficient digitalization

HR information systems may contain demographic and administrative data while lacking a structured competency database.

Seventh — limited evaluation of training returns

Training departments often report:

- number of courses;
- number of participants;
- training hours;
- expenditure.

However, boards and executive management need to know:

What changed in business performance as a result of training?

4.5. Proposed seven-stage personnel training mechanism

This study proposes an integrated model consisting of seven stages.

Stage 1. Strategic competency forecasting

Future competencies should be derived from:

- corporate strategy;
- investment projects;
- technological modernization;
- market expansion;
- organizational restructuring;
- regulatory change.

A competency forecast can cover a three-to-five-year horizon.

Stage 2. Competency architecture

Each strategically important position should have a competency profile.
A recommended structure includes:

A. Professional competencies

Job-specific knowledge and skills.

B. Digital competencies

Data analysis, software, AI, digital communication and cybersecurity.

C. Managerial competencies

Leadership, planning, decision-making and project management.

D. Cognitive competencies

Analytical thinking, creativity and problem-solving.

E. Socio-emotional competencies

Communication, teamwork, adaptability and emotional intelligence.

4.6. Digital competency passport

Each employee should have a digital competency profile integrated into HRIS.
It may include:

- current position;
- competency level;
- certification status;
- completed training;
- project experience;
- performance history;
- career interests;
- development needs;
- succession readiness;
- future role suitability.

This creates a foundation for evidence-based personnel development.

4.7. Skills-gap measurement

For each competency:

$$SG_i = RC_i - AC_i$$

where:

SG_i — skills gap for competency i;

RC_i — required competency level;

AC_i — actual competency level.

If:

$SG_i = 0$ — competency corresponds to requirements;

$SG_i > 0$ — development is required;

$SG_i < 0$ — employee competency exceeds current role requirements.

The latter case is particularly important because it may indicate readiness for promotion or more complex responsibilities.

4.8. Employee-level Competency Gap Index

For n competencies:

$$CGI = \Sigma(w_i \times SG_i) / \Sigma w_i$$

where:

w_i represents the strategic importance of competency i.

This makes it possible to prioritize training expenditures.

4.9. Individual learning pathways

Instead of sending all employees to identical training programmes, the company can assign differentiated pathways.

Table 2

Example of competency-based employee segmentation

Employee category	Recommended intervention
Competencies match requirements	Maintain and certify
Minor competency gap	Upskilling
Major technical gap	Intensive professional training
Role at risk of automation	Reskilling
High-performance/high-potential	Leadership development
Excess competencies	Promotion/internal mobility
Future critical skills gap	Strategic development programme

This enables the organization to move from:

training employees → developing strategic capabilities.

4.10. Corporate learning ecosystem

The personnel-development mechanism should combine internal and external resources:

**Corporate University

- Universities

- Professional training institutions
- Online platforms
- Industry experts
- International certifications
- Internal mentors
- Workplace learning**

Such a system can significantly expand learning opportunities without requiring all programmes to be produced internally.

4.11. Blended personnel-development model

Training should combine:

- classroom education;
- online education;
- microlearning;
- mentoring;
- coaching;
- job rotation;
- job shadowing;
- simulation;
- project-based learning;
- action learning;
- professional certification.

The increased adoption of digital learning does not eliminate workplace learning.

Instead:

Digital learning provides knowledge; workplace application converts knowledge into competence.

4.12. Modern corporate examples

Recent corporate practices illustrate the transition toward integrated learning systems.

For example, Pearson reported introducing a Learning Hub integrated with LinkedIn Learning and a broader career-navigation system. Employees completed more than 23,000 learning hours and hundreds of thousands of microlearning items after its 2025 launch, while AI skills were incorporated into development goals.

BI Development reported that its corporate learning ecosystem covered 60% of employees in 2025, while average training hours increased from 17 hours in 2024 to 27 hours in 2025. The company combines corporate-university programmes, external certification and dual-learning formats.

These examples should not be mechanically transferred to Uzbekistan. However, they illustrate the institutional shift from isolated courses toward corporate learning ecosystems.

4.13. Personnel training performance indicators

Training effectiveness should be evaluated through multiple dimensions.

Table 3

Proposed KPI system

Indicator	Formula / Interpretation
Training Coverage Rate	Trained employees / total employees ×100
Training Completion Rate	Completed programmes / enrolled programmes ×100
Certification Rate	Certified employees / participants ×100
Competency Gap Reduction	(Gap before – gap after) / gap before ×100
Training Application Rate	Employees applying acquired skills / trained employees ×100
Digital Learning Share	Digital learning hours / total learning hours ×100
Internal Mobility Rate	Internal appointments / total appointments ×100
Succession Readiness	Ready successors / critical positions ×100
Retention of Critical Talent	Retained critical employees / total critical employees ×100
Productivity Improvement	Productivity after training / before training
Training ROI	Net benefits from training / training costs ×100

4.14. Personnel Training Effectiveness Index

The following composite indicator is proposed:

$$PTEI = w_1CGR + w_2TAR + w_3PIG + w_4IMR + w_5RTR$$

where:

PTEI — Personnel Training Effectiveness Index;

CGR — Competency Gap Reduction;

TAR — Training Application Rate;

PIG — Productivity Improvement Growth;

IMR — Internal Mobility Rate;

RTR — Retention Rate of strategically important personnel;

$w_1 \ldots w_5$ — weighting coefficients.

The weights can vary depending on corporate strategy.

For example, a technologically transforming company may assign greater weight to competency-gap reduction.

A company facing high turnover may place greater weight on retention.

The findings suggest that the central weakness of conventional personnel-training systems is not necessarily insufficient expenditure but insufficient connection between expenditure and strategic competency needs.

A large training budget may produce limited benefits when:

- participants are poorly selected;
- programmes are not aligned with actual skills gaps;
- acquired knowledge is not applied;
- managers do not support learning;
- employees have no career incentives;
- training outcomes are not measured.

Therefore, the economic logic of personnel development should move from:

training expenditure → training investment.

An expenditure-focused approach asks:

How much did the company spend?

An investment-focused approach asks:

What organizational capability was created?

This distinction is fundamental for joint-stock companies because shareholders and boards require evidence of value creation.

OECD evidence supports greater employer participation throughout the learning cycle. Employers can contribute to curriculum design, training provision, work-based learning and evaluation because they possess direct knowledge of skill requirements.

At the same time, employer participation should not produce excessively narrow firm-specific training. Employees need transferable competencies that remain useful across technologies and career pathways.

The ILO's 2026 framework supports this multidimensional view by emphasizing that socio-emotional, cognitive, digital and occupational competencies work most effectively as complementary bundles.

7. CONCLUSION

The analysis of global and national developments during 2020–2026 demonstrates that personnel development is becoming one of the central elements of corporate competitiveness.

The rapid diffusion of AI, automation, digital technologies and new business models is accelerating competency obsolescence. The WEF estimates that nearly 40% of required job skills may change by 2030 and that 59 out of every 100 workers may require additional training.

The ILO's 2026 evidence demonstrates that successful workers increasingly need combinations of cognitive, socio-emotional, digital and occupation-specific competencies, while lifelong learning should become a permanent feature of economic and enterprise development.

OECD research further demonstrates the growing relevance of a skills-first approach, in which actual capabilities, skills development and recognition increasingly complement formal qualifications.

For joint-stock companies, these developments require transition from fragmented training programmes to an integrated personnel-development mechanism.

The proposed mechanism is structured as:

The key methodological shift is that the training process begins not with the question:

“Which course should employees attend?”

but with:

“Which strategic competencies will the company require, what is the existing gap, and how should that gap be eliminated most efficiently?”

This transformation can enable joint-stock companies to convert personnel training from an administrative HR function into an integrated mechanism of strategic human-capital development.

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