MKU Researchers Showcase Innovative Research and Sustainable Solutions at the 2026 Annual University and iN4iN Conference

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International IDEAS Summer School Kenya & AUC-iN4iN Conference 2026

Co-Creating Sustainable Solutions: Scaling MSMEs through SDG 9

FROM COLLABORATION TO CO-CREATION: A CONTEXTUAL FRAMEWORK FOR UNIVERSITY–INDUSTRY INNOVATION IN KENYA

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A conceptual synthesis for university–MSME partnerships and sustainable livelihoods

INTRODUCTION & BACKGROUND

- Universities contribute research, expertise, facilities and talent; firms contribute market knowledge, operational needs and routes to adoption.
- In Kenya, university–industry links are recognized as important, but evidence remains fragmented on how partnerships progress from interaction to sustained co-creation.
- Co-creation requires joint problem definition, shared decision rights, pooled resources and jointly attributable outputs.

STUDY PURPOSE & OBJECTIVES

Purpose: Develop a context-sensitive framework explaining how university–industry co-creation can generate innovation and shared value in Kenya.

- Distinguish collaboration, knowledge co-development and value co-creation.
- Identify partner characteristics and enabling conditions.
- Explain co-creation processes and multidimensional outcomes.
- Develop propositions to guide future empirical testing.

METHODOLOGY

- Design: Conceptual desktop research and critical thematic synthesis.
- Sources: Peer-reviewed studies (2016–2026), systematic reviews and Kenyan/African research, contextualized with CUE 2025 sector statistics.
- Analysis: Global-to-local synthesis across collaboration forms, partner characteristics, enabling conditions, processes and outcomes.
- No primary data were collected; the framework is proposed, not empirically validated.

PROPOSED CONCEPTUAL FRAMEWORK



KEY INSIGHTS FROM THE LITERATURE

- Co-creation is distinct from general contact: it involves joint problem definition, shared decision rights, pooled resources and jointly attributable outputs.
- Five connected dimensions shape co-creation: partner/ecosystem characteristics; enabling conditions; co-creation processes; outputs/outcomes; and value creation with feedback.
- Enablers include strategic alignment, trust and relational quality, complementary capabilities, governance/leadership and intermediary support.
- Absorptive capacity, collaboration readiness and prior experience condition whether joint work becomes adopted innovation.
- SMEs and established companies need differentiated partnership arrangements; firm size alone does not determine readiness or value.
- Outcomes extend beyond prototypes to adoption, commercialization, organizational learning, economic, knowledge, social and environmental value.

RECOMMENDATIONS

- Universities: establish challenge-led joint research, applied projects, student placements and clear IP, data and revenue-sharing arrangements.
- Strengthen liaison offices, technology-transfer offices and innovation hubs; recognize applied research and industry engagement in staff incentives.
- SMEs: use clusters and business associations to access research, testing and technical support; invest in staff skills and data readiness.
- Government/development partners: fund collaborative research, innovation vouchers, shared facilities and early-stage finance; reduce barriers for smaller firms.
- Regulators: track co-created projects, firm partners and adoption outcomes.

CONCLUSION

Co-creation is a relationship and process capability—not simply a signed agreement. Its contribution to innovation and sustainable livelihoods depends on joint work, adoption, commercial viability and inclusive value distribution.

ACKNOWLEDGEMENT

We gratefully acknowledge the ACCESS Project, Mount Kenya University and the University of Leipzig for their support and collaboration in the 2026 Annual University and IN4IN Conference

SELECTED REFERENCES

Jaakkola (2020); Snyder (2019); de Wit-de Vries et al. (2019); Nsanzumuhire & Groot (2020); Cohen et al. (2025); CUE (2025). Conceptual framework; empirical testing is required.

University–industry co-creation moves beyond contact or technology transfer: partners jointly define problems, share decisions and resources, and develop solutions that create measurable value.

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Co-Creating Sustainable Solutions: Scaling MSMEs through SDG 9

INFLUENCE OF INTEGRATED SUSTAINABILITY STRATEGIES ON SME PERFORMANCE IN KENYA

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INTRODUCTION & BACKGROUND

- **Context:** Kenyan MSMEs support employment, livelihoods, value chains and innovation, but face finance, market, technology and climate-related pressures.
- **Purpose:** To examine how integrated economic, social and environmental sustainability strategies influence MSME performance in Kenya.

STUDY OBJECTIVES

- Review economic, social and environmental sustainability strategies in Kenyan MSME literature (2020–2025).
- Examine links between digital skills, business data, technology adoption, performance and resilience.
- Assess enterprise-support contributions, identify barriers and propose actions.

METHODOLOGY

- **Design:** Desk-top research using a structured review and thematic synthesis of secondary information.
- **Scope:** Kenyan MSMEs; sources dated 1 January 2020–31 December 2025.
- **Sources:** Government policies, institutional reports, surveys and peer-reviewed studies. No primary data were collected.

ANALYTICAL FRAMEWORKS

- **Resource-Based View:** Knowledge, skills, technology and networks as enterprise resources.
- **Dynamic Capabilities:** Ability to identify change, respond and reorganize resources.
- **Triple Bottom Line:** Economic, social and environmental dimensions of performance.

KEY FINDINGS & BENEFITS

- **Economic resilience:** Cash-flow management, working capital, market access and flexible supply chains are central; affordable finance remains a major constraint.
- **Digital capability:** MSE acceptance of digital payments rose from 59% (2020) to 86% (2023); record keeping increased from 39% to 54%, and social-media marketing from 13% to 21%.
- **Social sustainability:** Worker safety, fair treatment, skills development and customer trust support inclusive livelihoods and business continuity.
- **Environmental opportunity:** Waste reduction, efficient energy and water use, and green products can reduce costs and create opportunities; sector-wide adoption evidence remains limited.
- **Partnership benefits:** University incubation, mentorship and combined technical–financial assistance can strengthen knowledge, product development and employment.

RECOMMENDATIONS

- MSMEs: Maintain simple business records; use affordable digital tools; protect business data; and adopt practical waste, water and energy-saving measures.
- Universities: Co-design practical training, business clinics, mentorship, incubation and supervised student consulting, with follow-up.
- Policymakers & partners: Expand appropriate finance and coordinate referrals to markets, technology and technical support.

CONCLUSION

Sustainability is an integrated business approach, shaped by enterprise capacity, resources and coordinated support.

ACKNOWLEDGEMENT

We gratefully acknowledge the ACCESS Project, Mount Kenya University and the University of Leipzig for their support and collaboration in the 2026 Annual University and IN4IN Conference

SELECTED REFERENCES

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- FSD Kenya (2024). Annual Report 2023.
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SME resilience is strengthened when financial and operational discipline is combined with digital capability, skills, responsible resource use and supportive partnerships.

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"Co-Creating Sustainable Solutions: Scaling MSMEs through SDG 9"

Bridging the Finance and Risk Gap: A Project-Based Service Learning Model Linking MKU Students with Thika MSMEs for Sustainable Livelihoods and Graduate Employability

Joan Mumaraki, PhD Finance, Mount Kenya University

School of Business and Economics, Department of Accounting and Finance, Mount Kenya University.

Introduction:

- This conceptual proposal presents a Project-Based Service Learning (PBSL) model linking MKU finance, risk-management and accounting students with selected MSMEs in Thika. The model aims to strengthen MSME financial capability while providing students with supervised, community-engaged learning opportunities.

Background:

- MSMEs sustain local economic activity but may face challenges in financial management, weak financial records/poor record keeping, limited cash-flow visibility, access to finance and exposure to business risks. Students may also have limited opportunities to apply classroom knowledge in real enterprise settings. A structured university-MSME partnership can support both enterprise development and applied student learning.

Objectives:

- To propose a PBSL framework that links students with MSMEs; supports financial record-keeping, cash-flow visibility and risk management; and strengthens student applied competence and employability providing a testable model for future implementation and evaluation.

Methodology:

- A proposed 12-week co-creation pilot using participatory action research. Weeks 1-2: orientation and baseline needs assessment (Financial-literacy, record-keeping and risk-management). Weeks 3-10: co-development and testing of coursework-aligned tools (financial and risk-management tools). Weeks 11-12: review, reflection, handover and post-intervention assessment. Compare baseline and endline findings; integrate quantitative indicators with qualitative feedback.

Anticipated Outcomes & Proposed Pilot:

- For MSMEs: better financial records, cash-flow visibility, risk awareness/risk management capability and credit readiness.
- For students: practical financial analysis, bookkeeping, risk assessment, communication and employability readiness.
- Next steps: refine tools; establish partnerships; obtain approvals; seek Vice-Chancellor's Research Grant support for a 2027 pilot.
- Possible future extension: responsible AI-assisted drafting and scenario testing, subject to ethics approval, data protection and human oversight.

Acknowledgement:

- This conceptual proposal was prepared for the AUC-iN4iN Conference 2026. Funding support is proposed through the Vice-Chancellor's Research Grant.

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"Co-Creating Sustainable Solutions: Scaling MSMEs through SDG 9"

Deploying Humanoid Robotics in African Universities: Opportunities, Challenges, and Educational Framework

Elena Mwai, Coordinator AI, Digital Transformation and Emerging Technologies/Lecturer, Mount Kenya University

Case study of the Robotics, AI and Immersive Technologies (RAIT) Laboratory, Mount Kenya University, Kenya

Introduction:

- Artificial intelligence is moving from software into physical, embodied systems. Humanoid robots are now being piloted as tutors and teaching assistants, and reviews report gains in learning on restricted tasks (Belpaeme et al., 2018; Woo et al., 2021).
- African universities are urged to build AI capability, but digital skills, infrastructure and staff preparedness remain limited (Ndibalema, 2025; Matere, 2024).

Problem:

- African universities are starting to acquire humanoid robots, yet the topic is essentially absent from African higher education research (Okagbue et al., 2024), so there is no tested guide for introducing one.
- A robot and laboratory are costly and hard to reverse. Without safety rules, ownership, teaching plans and maintenance funding agreed before first use, the robot may sit idle or be used unsafely.

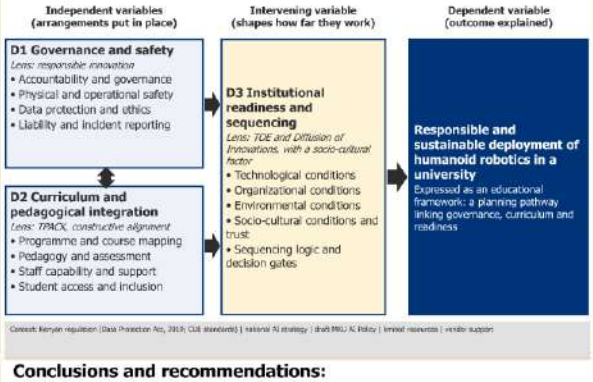
Objectives and research questions:

- Document the governance and safety arrangements being established for humanoid robotics in an African university.
- Examine how curriculum and pedagogical integration is planned across departments and programmes.
- Analyse the sequencing and institutional readiness considerations shaping the move from strategy approval to deployment.
- Propose an educational framework that links these three areas, for other African institutions planning similarly.

Methodology:

- **Design:** qualitative single-case study (Yin, 2018) of the Robotics, AI and immersive Technologies Laboratory at Mount Kenya University, at the pre-deployment stage.
- **Evidence:** two interviews, one focus group record (4 academic staff), a questionnaire (n = 28: 24 students, 4 academic staff, 2 administrative staff), the robot manual and the draft MKU AI Policy.
- **Analysis:** thematic analysis (Braun & Clarke, 2006) and descriptive statistics, compared across sources.

Conceptual framework

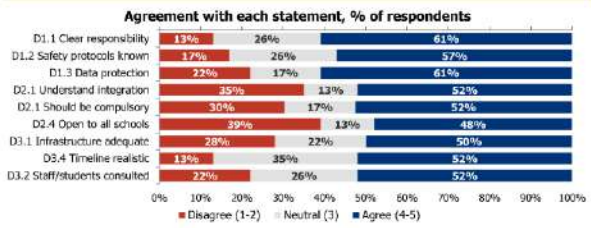


Conclusions and recommendations:

- Policy and governance: approve the AI Policy and the RAIT Laboratory Access and Safety Policy, fill the technician post, and complete data protection and risk assessments before student access.
- Define the safety duties of the laboratory manager, technician and supervisors.
- Fund maintenance and technical support before arrival.
- Certify staff before opening access, and explain to students how the laboratory fits their courses.
- Plan cross-school access and equity from the start.

Results:

- **Governance and safety:** interviewees named the school administration and the vendor's protocols. The robot manual requires a trained operator and protective stand. The draft MKU AI Policy (in validation) adds a Steering Committee, an AI Lead, a RAIT Laboratory Technician, induction, supervised sessions and incident reporting. 61% of respondents agreed responsibility is clear.
- **Student learning:** planned courses cover robotics programming, AI and machine learning, computer vision, and data science and analytics on robot sensor data. Only 52% understand how the laboratory fits coursework.
- **Readiness:** about 50% agreed infrastructure is adequate, mostly academic staff; students rated it lower, probably knowing less about it.
- **Main risks:** maintenance funding (6) and staff training and capacity (5); safety certification (6) should come first.



What the literature adds for universities:

- **Plan in stages and record the process:** evidence is short-term and almost none is African (Okagbue et al., 2024; Woo et al., 2021).
- **Prepare lecturers first:** teacher skills, resources and outdated ICT policies are the main barriers (Ndibalema, 2025; Zivanayi & Malinga, 2025; Matere, 2024).
- **Govern before deploying:** classroom robots raise privacy, role and responsibility issues (Serholt et al., 2017), safety standards exist (Harper & Virk, 2010), and African universities are only starting on AI rules (Thaldar et al., 2025).
- **Treat readiness as more than hardware:** leadership, funding and trust shape adoption, and it fails when technology outpaces governance (Chege & Kihara, 2025; Aryee et al., 2026).

Proposed educational framework: a staged pathway with decision gates

Stage	Gate to the next stage
1 Readiness baseline and resource assurance (D3)	Funded maintenance plan; named technical support
2 Governance and safety foundation (D1)	Accountable owner and safety officer named; safety and incident procedures approved
3 Staff capability and certification (D2, D1)	Staff certified; technician in post
4 Curriculum integration pilot (D2)	Units mapped to outcomes; pilot approved
5 Phased student access (D2, D1)	No unresolved serious incident; access plan for all schools
6 Review, evidence and scaling (D3)	Evaluation report; decision recorded

Acknowledgement:

- The author thanks the staff and students of Mount Kenya University who completed the questionnaire. Funding: None.

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ARTIFICIAL INTELLIGENCE ON RECRUITMENT EFFICIENCY IN RECRUITMENT AGENCIES IN NAIROBI COUNTY, KENYA

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INTRODUCTION

- The introduction of artificial intelligence tools like AI-driven candidate screening systems, AI interview scheduling software, AI communication chatbots, and AI data analytics solutions offers a great opportunity for recruitment agencies in to transform their operations and boost recruitment efficiency

BACKGROUND

- The use of AI in the recruitment process has significantly increased at a global scale.
- The recruitment industry in Kenya has grown substantially in recent years
- AI is still in the early stages of its use in the recruitment process in Africa but is beginning to grow in popularity

OBJECTIVES

- To determine the effect of AI-based candidate screening recruitment efficiency
- To examine the effect of AI-driven interview scheduling on recruitment efficiency
- To assess the effect of AI-supported communication systems on recruitment efficiency
- To evaluate the effect of AI-based data analytics on recruitment efficiency

METHODOLOGY

- Cross-sectional approach, which involves collecting data from a sample at one specific point in time
- 78 Human Resource Managers drawn from registered recruitment agencies operating in Nairobi County
- Data collection tool was structured questionnaire

RESULTS

- **AI-driven candidate screening not only saves time on reviewing unqualified resumes but also enhances the quality of the candidates that are shortlisted**
- **AI-powered interview scheduling reduces scheduling conflicts and the loss of interview opportunities, and gives recruiters more time to work on more valuable recruitment activities.**
- **AI-powered communication tools like chatbots and automation for message delivery enable agencies to provide timely responses to candidate questions and maintain updates on candidates throughout the recruitment process**
- **Analytics data analytics tools enable agencies to track the effectiveness of recruitment efforts, determine which sourcing channels are effective, and improve hiring decisions.**

RECOMMENDATIONS

- Recruitment agencies should prioritize investment in analytics tools that help them monitor performance, identify effective sourcing channels, and make data-driven hiring decisions. Agencies should also build the capacity of their staff to interpret and use analytics reports effectively.
- cut down on their time-to-fill, the cost of their hire, and enhance the overall quality of their recruitment service, which will lead to greater client satisfaction and competitiveness in the recruitment industry

ACKNOWLEDGEMENT

Appreciation to the Nairobi county recruitment agencies for sharing their data and to Mount Kenya University for the opportunity to share the findings.

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FROM CULTURAL HERITAGE TO CREATIVE ECONOMY:

Leveraging Samburu Indigenous Arts for Innovation, Entrepreneurship and Sustainable Development in Kenya

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INTRODUCTION

- Indigenous arts preserve cultural identity, knowledge and community values.
- Among the Samburu, body adornment is a significant expression of social, cultural and moral heritage.
- Traditional artistic practices provide opportunities for innovation and socio-economic transformation.

BACKGROUND

- Samburu body adornment symbolizes age, status, identity and cultural belonging.
- Globalization, modernization and technological advancements are influencing traditional artistic practices.
- Indigenous artistic knowledge remains an underutilized resource for creative enterprise development.

OBJECTIVES

- Examine the cultural significance of Samburu adornment arts.
- Explore opportunities for transforming indigenous artistic knowledge into marketable products.
- Assess the potential of indigenous arts in promoting innovation, entrepreneurship and sustainable livelihoods.

METHODOLOGY

- Qualitative research design.
- Primary and secondary data collection.
- In-depth interviews, Focus Group Discussions and non-participant observation.
- Thematic analysis of cultural, artistic and innovation dimensions.

RESULTS / EXPECTED FINDINGS/RECOMMENDATIONS

- Traditional Samburu adornment arts possess significant innovation potential.
- Indigenous designs can be adapted into contemporary fashion and textile products.
- Creative industry development can generate employment and income opportunities.
- Preservation of cultural heritage can coexist with commercialization and innovation.
- Indigenous arts contribute to sustainable community development and resilience.
- Integration of indigenous knowledge strengthens inclusive



ACKNOWLEDGEMENT

- Appreciation to the Samburu community for sharing indigenous knowledge and cultural experiences.
- Appreciation to Mount Kenya University for academic support.

REFERENCES

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"Co-Creating Sustainable Solutions: Scaling MSMEs through SDG 9"

Enhancing Financial Management Skills among MSMEs through Universal Design for Learning: Evidence from Kenya: emphasizes practical skills development

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Department of Account and Finance., School of Business and Economics, Mount Kenya University.

Introduction:

Micro, Small and Medium Enterprises (MSMEs) are vital for Kenya's Economy.

- Creating jobs, generating income and driving innovation.
- However, effective financial management remain a major
- challenge among the owners and managers of MSMEs.

Background:

- The Challenge:
- Traditional Financial management training often fails to
- accommodate diverse education background and learning needs
- and practical experience of MSME owners.
- Purpose of the Study

Objectives:

- To Examine how Universal Design for Learning (UDA) can enhance Practical Financial management skills among MSME owners in Kenya.

Methodology:

- **Framework:**
  - Multiple means of engagement,
  - Multiple means of representation,
  - Multiple action & expression

Research Design

- Mixed-methods research design with evidence from MSME owners and manage

Results:

- **The study findings benefits**
- Table1: Practical Competency Pre- and Post-Training Assessment
- Paired Samples t-test results comparing practical financial management scores (out of 100%) before and after UDL-based training

Financial Management Skill Area	Pre-Test Mean (%)	Post-Test Mean (%)	Mean Gain (Δ)	t-statistic	p-value
Budgeting & Forecasting	42.3	78.5	+36.2	14.82	<0.001
Cash-Flow Management	38.6	81.2	+42.6	17.34	<0.001
Financial Record-Keeping	45.1	83.7	+38.6	16.10	<0.001
Working Capital Management	34.8	72.4	+37.6	13.95	<0.001
Financial Decision-Making	40.2	78.5	+38.3	18.76	<0.001
Overall Financial Skill Competency	**40.2**	**78.5**	**+38.3**	**18.76**	**<0.001**

Conclusions

- UDL significantly enhances practical financial management skills among MSME
- Multiple learning approaches (boost engagement, offer varied representation and allow practical application) leads to better skills and confidence
- An inclusive practice-oriented training model supports entrepreneurship and business growth in Kenya

The study recommends

1.For Policymakers

- Design inclusive financial education programmes

2.For Trainers

- Adopt UDL based training methods

3.For MSME

- Build financial Capability for business growth

Acknowledgement:

- This study was funded by:

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Teacher Psychological Well-Being as a Foundation for Innovative Teaching and Learner Achievement: Evidence from Public Secondary Schools in Kiambu County, Kenya

Edith Njoroge
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TRACK 2: AI & EMPLOYABILITY
in Higher Education | innovative teaching

1. Background

Innovative teaching needs teachers who can experiment, adapt and sustain change. Yet teacher well-being is rarely treated as part of the education innovation ecosystem.

In Kiambu County, **more than half** of the secondary schools posted a mean standard score **below 3.0** in the 2022 KCSE.

Research question: How do five dimensions of teachers' psychological well-being relate to learners' academic achievement?

2. Conceptual Framework



Ryff's well-being dimensions (independent variables)

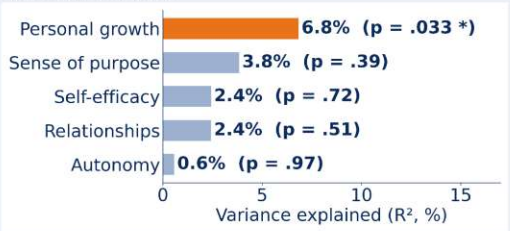
3. Methodology

227	221	23	11,500
public schools	teachers surveyed	principals interviewed	students observed

- **Design:** mixed methods, concurrent triangulation
- **Theory:** Ryff's model of psychological well-being; production function theory
- **Data:** teacher questionnaires (85% response), principal interviews, student observation guides, 3-year KCSE document analysis
- **Quality:** expert-validated instruments; pilot in 3 schools; test-retest reliability
- **Analysis:** descriptive statistics, correlation and multiple regression; thematic analysis of interviews
- **Limitations:** cross-sectional design shows association, not causation; quasi-experimental follow-up recommended

5. Results

Share of variation in learners' achievement explained by each well-being dimension



Orange bar: statistically significant ($p < .05$). R^2 computed from regression sums of squares; p-values from F-tests.

6. Key Findings

- **Personal growth** was the only dimension with a significant effect on achievement ($F(7, 213) = 2.23$, $p = .033$)
- Self-efficacy, relationships, autonomy and sense of purpose were **not statistically significant**
- Effects were modest: each dimension explained between **0.6% and 6.8%** of variation
- Principals stressed the value of positive relationships among school staff

7. Implications for Innovation

Teachers' **learning, mentoring and openness to new experience** mattered most for results. These are also the conditions that allow teachers to adopt innovative pedagogy. Schools, the Teachers Service Commission (TSC) and universities can **partner** to build teacher growth into the education innovation ecosystem.

8. Recommendations

- **Principals:** introduce mentorship programmes and peer working groups
- **Boards of management:** safeguard teachers' freedom to choose teaching methods
- **TSC:** add purpose and well-being modules to Teacher Professional Development; create a well-being tool alongside TPAD
- **Counties:** set up Guidance and Counselling Units for teachers

Edith Njoroge | School of Education, Mount Kenya University

Reference: Ryff, C. D. (1989). Journal of Personality and Social Psychology, 57(6), 1069-1081.

SDG 9: Industry, Innovation and Infrastructure

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