



TECH & INNOVATION SUMMIT REPORT

2nd KESA SUMMIT

KESA SUMMIT REPORT

The report details the rapporteur's reports, judges reports and a prescreening committee of experts' findings in regards to projects presented by students with an aim to reduce unemployment and the cost of living in Kenya. The report was compiled and edited by the following:

Kefa Simiyu – Rapporteur-in-Chief
Moses Muchiri Mwangi – Organizing and Legal Secretary, KESA.

Tech & Innovation Summit Report

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Economics Students Association of Kenya (KESA) founded in 2021 marks a pivotal moment in our nation's journey towards addressing economic challenges. With a core mission to bridge the gap between theoretical knowledge and practical application, KESA is poised to make a significant impact in our country's economic, social, and political landscape.

In a world marred by persistent economic hurdles, it's imperative for young economists to step forward and confront these challenges head-on. KESA recognizes the urgent need to empower its members to translate their academic insights into tangible solutions that benefit all members of society. Whether in rural or urban areas, and irrespective of gender or societal divides, every individual deserves the right to development.

At the heart of KESA's vision lies a commitment to an economically robust and human-centric approach. We believe that sustainable progress can only be achieved by prioritizing the well-being and dignity of every person. By advocating for inclusive policies and initiatives, KESA aims to address the systemic barriers that hinder equitable access to opportunities and resources.

As we stand shoulder to shoulder with those at the forefront of change, KESA is dedicated to fostering collaboration, innovation, and advocacy. Together, we can pave the way for a more prosperous, just, and inclusive future for all Kenyans.

Moses Muchiri Mwangi
Organizing and Legal Secretary
KESA

EXECUTIVE SUMMARY

The Tech & Innovation Summit 2024 was anchored on the possibility of progress following Paul Michael Romer, the 2018 Riksbank Prize in Economic Sciences co-recipient. The theme's centrality echoed Robert Schiller—another Prize co-recipient—in recognizing the various crises that have tremendously shaped the lived experiences of the global community, and Kenyans. Accordingly, students from across economics clubs and associations researched possible means of ensuring that no crises went to waste. This research process culminated into ideas, prototypes, and executable actions cutting across a diverse spectrum of economic pursuits—revolutionizing fashion sector, enhancing food security, reimagining commerce, configuring community-centered tourism, management of electronic waste, improve record keeping within the dairy and healthcare sectors, and reshaping our understanding of priorities within healthcare, and job creation. There is a general appreciation of technology in shaping world views, and in creating a livable environment. However, a gap still persists despite the existing consensus that knowledge moves when people move. In particular, integrating gender differences to shape new ideas, and provoke new debates is at infancy. As the Summit concludes, it is regretted that representation of females in economics is low. Disturbing still is that the contribution of female students, in circumstances where they are involved, is yet to be realized. For instance, teams with female members were less likely to incorporate case studies despite case studies being definitive with regard to relative ranking of teams. This calls for policymakers, and the academia, to synergize efforts towards not only raising female representation in economics but also in ensuring that those included make contributions that actually count.

TECHNICAL SUMMARY

PART A: RAPPORTEURS' REPORT

Amanda Gony, Daniel Makau, Atieno Mollyne, Rosemary Chege, Judy Wambui Nganga, Agnes Karuri, and Kefa Simiyu

INTRODUCTION

This year's Summit was the first ever to incorporate rapporteurs, and actively engage them in every step of the way. The Rapporteurs' team was coordinated by the Organizing Secretary, and led by the Rapporteur-in-Chief.

The following were the team members:

1. Moses Muchiri Mwangi —Rapporteur Coordinator
2. Kefa Simiyu—Rapporteur-in-Chief
3. Amanda Gony— Africa Nazarene University, Assistant Rapporteur Coordinator.
4. Agnes Karuri—Mount Kenya University—Time Comptroller
5. Daniel Makau—Jaramogi Oginga Odinga University of Science and Technology
6. Atieno Mollyne—Chuka University
7. Rosemary Chege—Kenyatta University
8. Judy Wambui—Mount Kenya University

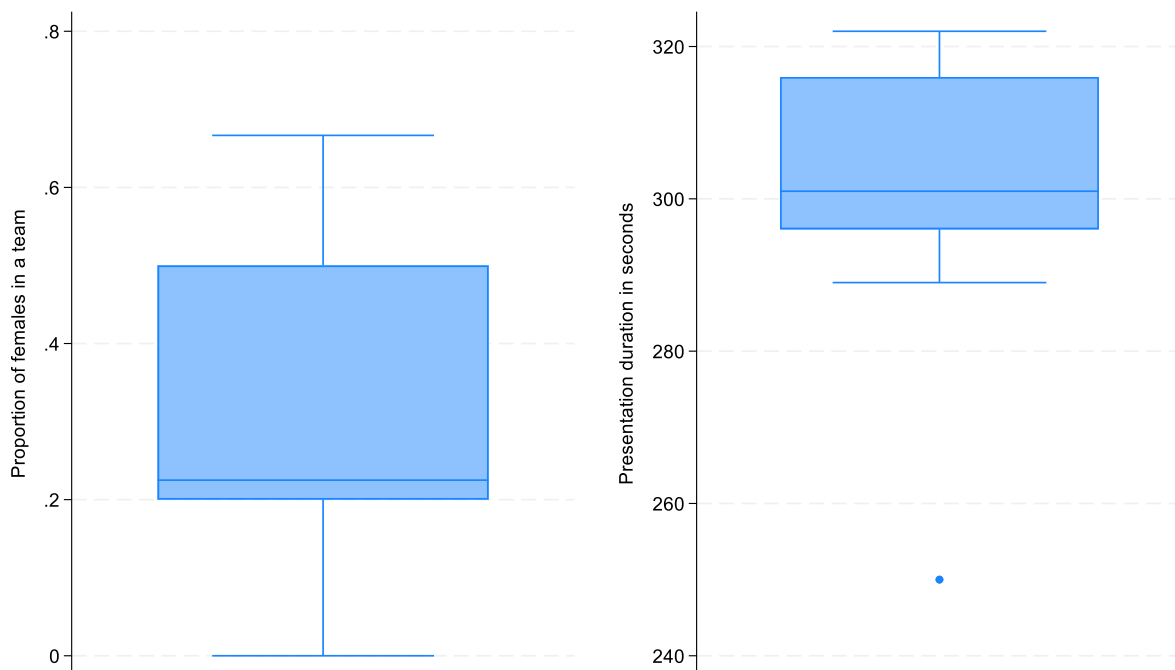
The team captured the following elements in the course of the presentations:

1. Gender of the presenters, and duration of individual presentation alongside time allocation to each presenter
2. Identified research gap, research question/ hypothesis, and the proposed objectives, and number of objectives as well as whether or not the objectives met the SMART criteria
3. Identified case study based on the project's background

4. Alignment to the theme, and any identified products that are in place/ whether the team has already executed the idea
5. Compilation and summation of scores as captured by Judges
6. Identification of the business model based on the following metrics: understandable and easy to follow, different from existing ones, applicable, already executed/ in place, economic impact, and key stakeholders/ beneficiaries

GENDER REPRESENTATION AND TIME ALLOCATION

The median team had one (1) female presenter among five (5) members (22.5%), with the presentation lasting 301 seconds. This translates to 0.5 seconds longer than the average presentation duration but within the 5 minutes allocated time.



The time captured by rapporteurs is independent of the durations reported by the Judges' Panel. In some teams, not all team members, especially females, on stage had the opportunity to present. Exactly seven (7) teams had female ratio exceeding 22.5%, and exactly 7 teams had this share falling below 22.5%.

In terms of time allocation bias with respect to gender composition of team members, a two-sample Kolmogorov-Smirnov test for equality was carried out. The teams were categorized into two groups based on the median share of female presenters—above or at most 22.5%. There were no material differences in allotted durations. This was further investigated in parametric two-test which revealed that average allocated durations across the two teams was equal. This is similar to a regression analysis that suggested duration equality between the two groups.

GAPS/ HYPOTHESES/ RESEARCH QUESTIONS AND OBJECTIVES

Research gaps and/ or research questions/ hypotheses were easily identifiable in all fourteen (14) teams except one (1). Although objectives were pointed out, only eleven (11) teams had objectives that were SMART—specific, measurable, achievable, realistic, and time-bound.

CASE STUDIES

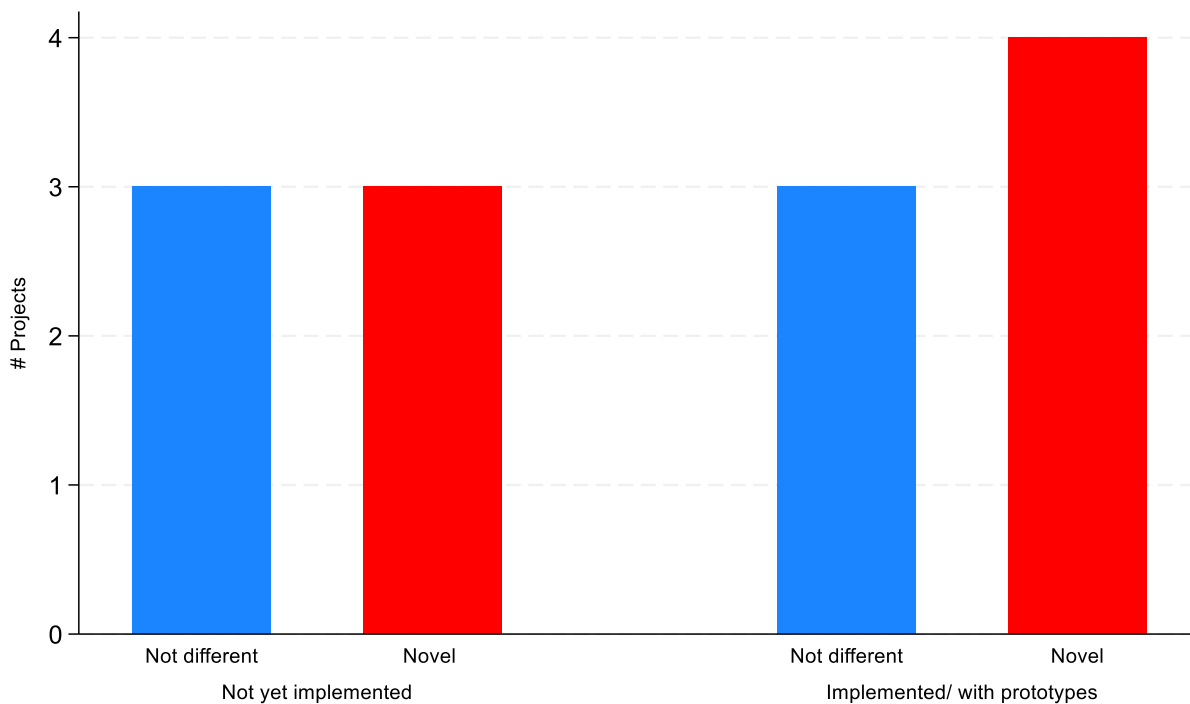
Five (5) teams identified relatable contexts within which similar ideas were explored. These case studies included: Dandora dumpsite in Nairobi, Homabay, Hong Kong, and Kisumu. Relatable contexts/ case studies were missing in nine (9) teams. This suggests the need for in-depth research.

THEME ALIGNMENT AND PROTOTYPES/ IMPLEMENTED PROJECTS

Whereas all projects were aligned to the Summit's theme, only four (4) had been executed. The four projects either had final products/ prototypes/ translated ideas into products. Among the 4, three (3) teams presented case studies that informed their projects, and further reinforced the research gap. Eight (8) teams neither indicated the case study nor presented any prototypes.

BUSINESS MODEL

13 projects were understandable and easy to follow, 7 were different from existing ones, 13 were applicable, 7 were either already executed or plans were underway to develop prototypes, and 13 had identifiable economic impacts. Among the 7 implemented projects, four (4) were novel (different from existing ones).



Novelty of the projects immaterially affects their execution as suggested in the Kolmogorov-Smirnov test.

PART B: JUDGES' REPORT

Celia Ounza, Steven Ndung'u, Godwille Mongare, Gabriel Dinda, Winnie Cherotich, and Kefa Simiyu

INTRODUCTION

The Judges' Panel constituted of six (6)—three (3) females and three (3) males. The Judges were drawn from various walks of life, and scholarship, with Kefa Simiyu as the Chief Judge. The following were the Judges:

1. Kefa Simiyu - Chief Judge
2. Steven Ndung'u - Lead Adjudication Rubric Designer
3. Celia Ounza
4. Godwille Mongare
5. Gabriel Dinda, PhD
6. Winnie Cherotich

No competing/ conflicting interests were reported. The Judges' Panel designed the Adjudication rubric, reviewed power point slides, and reviewed the revised projects alongside adjudicating the Summit. There was also a Pre-summit bench that conducted projects screening, and offered useful comments to the team. This bench was coordinated by the Organizing Secretary, and chaired by Kefa Simiyu. The following adjudicated the pre-screening phase:

1. Kefa Simiyu - Economics Scholar - Economics
2. Eugene Muchai - TIE - Entrepreneurship
3. Daniel Wakamiru - Financial Consultancy
4. Noel Otieno - Moi University - Economics
5. Moses Muchiri Mwangi – KESA - Economics

EXPERT COMMITTEE FINDINGS

Upon completion of the pre-screening, all teams were given the greenlight to present during the Summit. It is worthwhile noting that two of the projects had been plagiarized with a similarity index of 40% and 68%. The teams were duly informed, and advised to thoroughly revise the work. Moi University later withdrew from the Summit. Some teams replaced the pre-screening projects with entirely new ones during the Summit.

ADJUDICATION RUBRIC

Adjudication was based on 7 essential components—problem statement, innovative solution, impact, business model, stakeholder engagement, scalability and sustainability, and quality of the report and the presentation. These components were assigned respective weights as shown in the

APPENDIX. These weights aggregated to a possible maximum of one hundred (100) points per team per judge.

The team's scores [across judges] were then averaged using the arithmetic mean, and subsequently ranked.

GENERAL RESULTS OUTLOOK

The top position was hotly contested by two teams with the University of Nairobi Economics Scholar emerging the best team. Judges' individual preferences were then investigated against the overall ranking. Three judges preferred Kabarak University to Economics Scholar, and three otherwise. However, there is no noticeable dictatorship. For instance, one of the judges [with the largest award margin between the top-two contestants] preferred Machakos University to Kabarak University yet the latter outperformed the former. Generally, the top-two teams were preferred to any other team by the judges. Hence, there was no ambiguity over the top-two teams.

RESULTS

Team	Project	J1	J2	J3	J4	J5	J6	Mean Score	Rank
UoN— Economics Scholar	Re-Thread Cotton Cycle	96	83	67	80	77	74	79.5	1
Kabarak University	Thermosoothe	77	75.2	71	89	80	71	77.2	2
Multi-Media University	L'Option Durable	70	79	62	69		56	67.2	3
KCA University	Swift Shift	73	78	55	72		53	66.2	4
JKUAT-FE	Qwetu Farm	56.5	59	65	71	63	63	62.9	5
Mount Kenya University	E-Green Recycle	56	56	62	74		60	61.6	6
Karatina— GDSC	Moo-Agri Tech	52.5	75	49	70		60	61.3	7
CUEA	Medi-Corp	71	74	55.6	63	54	45	60.4	8
Karatina— Hult Prize	Linda Mama	58.5	76	48	72		48	60.5	9
Machakos University	Smart Fold Furniture	77.5	54	67	42	76	40	59.4	10
JOUST— BESA	Sericulture and mori-culture	45	70	36	64		40	51	11
Karatina— Econ	Savannah Voice	55	58	22	62		48	49	12
UoN— ECOSA	In-Tour	61.5	41	25	52		47	45.3	13
MMUST— ESSA	Artificial Clouds	51	37	22	49		47	41.2	14
Judge-sensitive mean score		64.3	66.3	50.9	66.4	70.0	53.7	60.4	

UoN—University of Nairobi, CUEA—Catholic University of Eastern Africa, JOUST—Jaramogi Oginga Odinga University of Science and Technology, BESA—Business and Economics Students Association, MMUST—Masinde Muliro University of Science and Technology. J1-J6 indicate the respective judge (see Appendix for judges' key). The ranking was adjusted to reflect the tie at position 7. Note: two errors of commission were identified—J3 assigned 9 points to CUEA under scalability whereas J2 assigned 17 points and 15 points to Kabarak University under impact, and business model, respectively. These scores were assumed to be out of 20, and revised in accordance to the Judge's matrix in the

APPENDIX. The revision downgraded CUEA to position 9, and widened the gap in the average score between the winner and the 1st runners' up.

ADJUDICATION BIAS AND GRADING DIFFERENCES

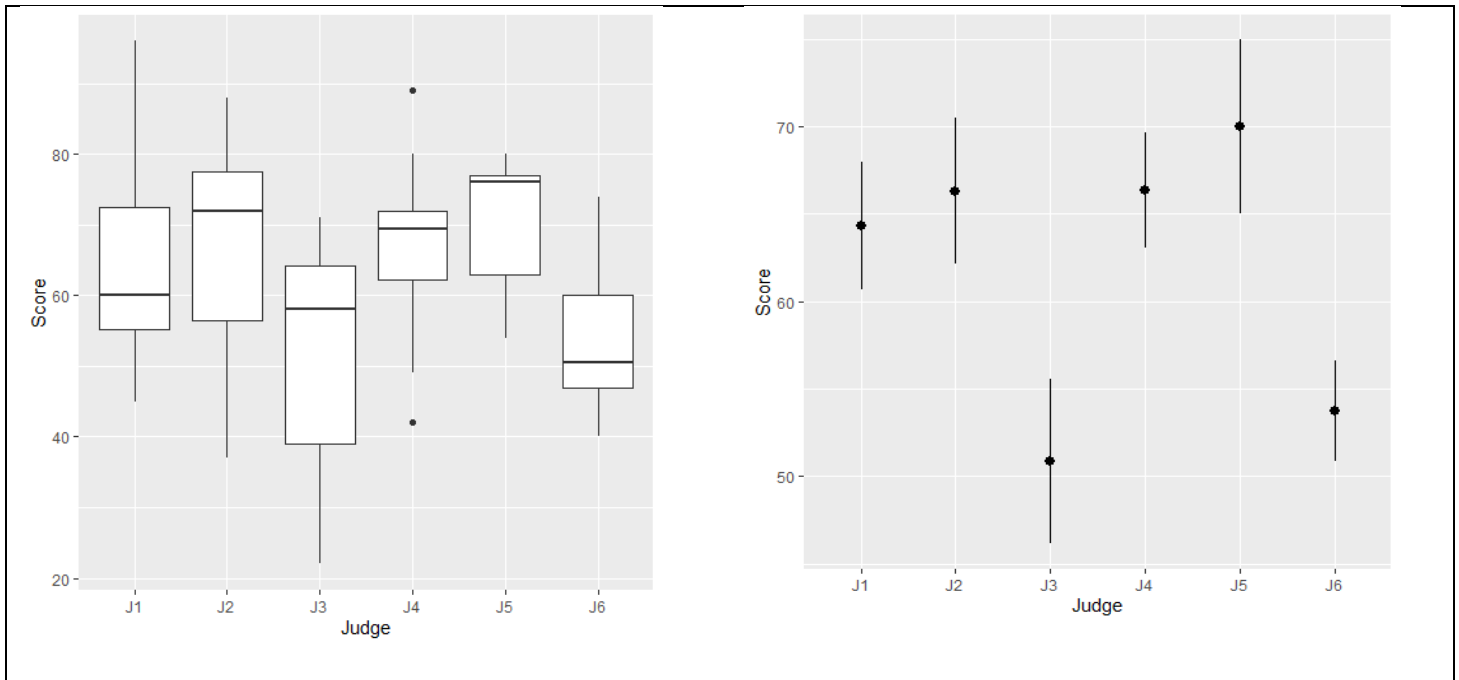
Differences in the grading was investigated using analysis of variance (ANOVA). This was realized via the employment of a completely randomized design (CRD)/ one-way ANOVA, and randomized block design (RBD). Effects not captured in the CRD are incorporated as block effects in the RBD. Blocks were given by the teams, and treatment/level was given by the Judge. The RBD model is given by:

$$Y_{ij} = \mu + \alpha_i + \beta_j + \epsilon_{ij}$$

Where levels i are designated J1-J6, j blocks are given by the teams (1-14), and the sample size per block/ level combination is 1. Y captures the observation receiving treatment level i , and is team (block) j . Overall mean is captured by μ . Block effects due to being in team j are captured by β whereas α are treatment effects due to level i of the factor. Error ϵ is a white noise term.

The null hypothesis of primary interest was whether higher scores could be realized with a particular Judge i . That's, equality of alphas across the judges was investigated. The null hypothesis of secondary interest focused on whether higher scores could be attained by being in a particular team. i.e., equality of betas across the teams.

The visualization suggests that much lower scores were awarded by J3 and J6 whereas higher scores were awarded by J2, J4, and J6.



The one-way ANOVA model reveals significant treatment effects at 5% significance level. This effect is more nuanced in the blocking model. There were noticeable block effects. The results were further investigated in the Tukey HSD based on multiple comparisons of means. There were significant differences in awarded scores for the following judge pairs: J3-J1, J3-J2, J6-J2, J5-J3, J6-J4, and J6-J5. However, there was no noticeable judge's bias. This was revisited in the following regression.

Teams with female presenters performed worse compared to those without. The performance was not attributable to bias based on the judge's gender. Notice that the coefficient for judge in models (2) and (3) is not any different from zero. This is also the case for model (1). However, teams with females perform as good as teams without females when controlling for other factors—case study, novelty, and implementation.

	(1)	(2)	(3)	(4)
Variables	Combined	Female	Male	Combined
Judge	-9.562 (7.043)	-9.563 (7.126)	6.646* (3.831)	-4.892 (11.34)
Presenter	-18.60*** (5.888)			-3.784 (7.507)
Judge* presenter	16.21** (8.023)			12.49 (10.46)
Case study				17.84*** (6.599)
Novelty				-4.092 (3.435)
Implemented				2.140 (3.361)
Case study*judge				-4.930 (9.125)
Constant	73.56*** (5.125)	73.56*** (5.185)	54.96*** (2.890)	55.92*** (8.594)
Observations	75	17	58	70
R-squared	0.132	0.107	0.051	0.287

The explained variable is team score. The estimates are based on ordinary least squares. *, **, and *** indicates that the coefficient differs from zero at 10%, 5%, and 1% significance levels, respectively. Judge or presenter assumes 1 for female, and 0 for male. Columns (1) and (4) utilize combined dataset; column (2) utilizes only teams that had at least a female presenter, and; column (3) focuses on teams without female presenters. Case study assumes 1 for teams that presented case studies, and 0 otherwise. Novelty assumes 1 for teams that presented projects different from existing ones, and 0 otherwise. ‘Implemented’ assumes 1 for teams that had already implemented the projects, and 0 otherwise.

DRIVERS OF DIFFERENCES IN PERFORMANCE

Upon controlling for three key components—novelty of the projects, case study inclusion, and final products/prototypes (implemented)—scores were determined by neither the judge’s gender nor the presenter’s gender. However, inclusion of case studies was the single most important factor that shaped the scores. In the OLS regression, a team with at least a case study had 17.84 points more compared to a counterpart without. Novelty and presence of a final product had no bearing on the scores. Case studies enabled the teams to identify the context within which the problem being addressed was. This further sharpened the team’s appreciation of existing market gaps, and gaps in research that could be bridged. In the absence of case studies, existing gaps could not be clearly brought out.

Selection bias is then investigated. There is no noticeable selection bias arising from gender of the judge. However, there is material selection bias between composition of the team, and case study presentation. This bias was evident in terms of team’s rating under three components—innovative solution, business model, and scalability and sustainability. There is a noticeably large negative bias suggesting that teams with female presenters were less likely to incorporate case studies in the projects.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Variables	Innovative solution			Business model			Scalability and sustainability		
Presenter	-13.17** (5.552)	-11.72** (5.826)	-5.590 (7.649)	-16.44*** (6.183)	-12.04* (6.489)	-0.508 (8.330)	-16.08** (6.550)	-15.67** (7.147)	-2.606 (9.156)
Judge	-3.028 (4.683)	-4.972 (4.858)	-4.583 (4.849)	0.931 (5.215)	0.135 (5.410)	0.866 (5.280)	6.394 (5.525)	5.209 (5.959)	6.038 (5.804)
Novelty		-2.476 (4.974)	-1.844 (4.981)		-11.66** (5.539)	-10.47* (5.424)		-1.455 (6.101)	-0.109 (5.962)
Implemented		8.845* (4.892)	8.728* (4.874)		8.893 (5.448)	8.673 (5.308)		1.963 (6.001)	1.714 (5.834)
Case study			8.178 (6.641)			15.37** (7.233)			17.42** (7.950)
Constant	70.28*** (5.473)	66.46*** (6.512)	57.93*** (9.491)	63.97*** (6.095)	62.75*** (7.253)	46.72*** (10.34)	75.29*** (6.457)	75.16*** (7.988)	56.99*** (11.36)
Observations	75	70	70	75	70	70	75	70	70
R-squared	0.079	0.138	0.158	0.089	0.171	0.225	0.091	0.090	0.153

The explained variable is the score for the respective category—innovative solution, business model, and scalability and sustainability.

The other components raised no doubts over selection bias. The scores were scaled to out of 100. Omitted variable bias (OVB)=actual-true=short model – long model. In estimating innovative solution, OVB=-13.17-0=-13.17 [0 since the coefficient “-5.590” is not statistically different from zero].

Arising question: Case studies mattered a lot in boosting the team’s score; however, teams with females were less likely to present case studies. Why was this the case?

DETERMINATION OF BEST PRESENTER

Two best presenters—one male and one female— were recognized based on the following metrics:

- i. Comes from a team that scored at least 70% (8.4 out of 12 points) on average under the report and presentation component, and the presentation variability was among the top 3 teams with the smallest standard deviation.
- ii. Belongs to a team that was awarded at least 50 aggregate points by each of the judges. That is, none of the judges awarded an overall score below 50 points to the team.
- iii. Made the most significant contribution to the team during the presentation.

Team	Average presentation score	Presentation SD	≥50points
MMUST— ESSA	7.6	2.61	
UoN— ECOSA	7.8	2.39	
JOUST— BESA	7.9	3.21	
Machakos University	8.5	2.17	
Karatina—GDSC	8.5	2.00	
KCA University	8.6	1.52	↑
Karatina—Econ	8.7	1.64	
Mount Kenya University	9.3	1.99	
JKUAT—FE	9.33	1.51	↑
Karatina— Hult	9.4	2.07	
Multi-Media University	9.6	1.82	
CUEA	9.67	2.07	
Kabarak	10.33	2.25	
UoN—Economics Scholar	11	1.10	↑

Based on conditions (i.), and (ii.), KCA University, JKUAT FE, and UoN—Economics Scholar Panel were possible candidates for best male presenter award. On condition (iii.), the Judges believed that the two presenters from Economics Scholar made comparably equal contribution. Similarly, JKUAT FE was believed to have equally split the contribution among various presenters. KCA University fielded a sole presenter. The Judges were convinced beyond any reasonable doubt that the most significant contribution came from KCA University. This is despite technical challenges that rendered it impossible for presentation slides to be projected. The best male presenter award accordingly went to:

1. Hillary Choge—KCA University

For the best female presenter, judges were of the view that condition (iii) mattered more than conditions (i) and (ii). As a result, conditions (i) and (ii) were partially waived. The basis of the waiver was that female presenters from Multi-Media University, JKUAT FE, and Karatina—Econ had comparably limited time to make substantive presentations. This led to the best female presenter being fielded by Mount Kenya University. The best female presenter accordingly went to:

2. Faith Kerubo—Mount Kenya University

APPENDIX

ADJUDICATION MATRIX

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JUDGE PROJECT EVALUATION MATRIX

Project Name:	Date:
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KESA TECH & INNOVATION SUMMIT JUDGING RUBRIC:

Which KESA project most effectively presented a plausible concept that includes Technology innovation to spur sustainable living in Kenya?

SCORING INSTRUCTIONS

To qualify the judging criterion, rate each category as Poor, Fair, Good or Very Good (The input in the boxes should be specific scores guided by the points on each category) using the following scoring matrix.

Judging Essentials	Poor	Fair	Good	Very Good
Problem Statement (20 points): - Clarity in addressing the summit's theme. - Demonstrate understanding of the background of the problem. - Demonstrate a clear understanding of the existing gap, Opportunity, Need or Problem related to the theme. - Who is affected, how are they affected & what risk is involved.				

ECONOMICS STUDENTS ASSOCIATION OF KENYA

Innovative Solution (20 points): - Creativity and originality of the proposed solution. - Feasibility and implementation of the solution within the given constraints. - Critical evaluation of the strengths, weaknesses, opportunities, and threats associated with the proposed solution.				
Impact (12 points) - Potential impact on addressing the identified gap and solving the problem. Impact is in the form of; jobs created, income generated, lives impacted among other measurable metrics.				
Business Model (12 points) - Allocation of resources needed to actualize the idea. - Return on Investment.				
Stakeholder Engagement (16 points): - Inclusion of strategies to engage public and private sectors in implementing the solution. - Demonstrating how the proposed model, invention, or system can be understood and adopted by specific stakeholders.				
Scalability and Sustainability (8 points): - Can the concept be replicated elsewhere with ease? - Is the concept sustainable?				
Report & Presentation Quality (12 points): - Clarity, coherence, and organization of the report. - Conciseness and effectiveness in presenting key information within the specified page limits and time constraint. - Unique presentation styles or use of multimedia in the report. - Engaging and compelling presentation during the summit.				

NOTE

Overall, the judging criteria aim to assess the teams' ability to identify a problem, propose an innovative solution, engage relevant stakeholders, present their ideas effectively, and critically analyze the feasibility and impact of their solution.

JUDGE'S COMMENTS

Valuable insights or suggestions related to the project's Problem statement:

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Valuable insights or suggestions related to the project's Solution and positive impact:

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Valuable insights or suggestions related to the project's Reporting and presentation:

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GRADING _____ / 100

Judge Name _____

Signature _____

JUDGES' KEY

J1—Kefa Simiyu, J2—Celia Ounza, J3—Steven Ndung'u, J4—Godwille Mongare, J5—Gabriel
Dinda, J6—Winnie Cherotich



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