Call for Proposals - KENET Innovation Grants in the use of Education Technology in Engineering and Computer Science Education

January 2020

KENET Innovation Grants Overview

KENET has as one of its mandates, the role of catalyzing collaboration in research and education among member universities and research institutions. KENET promotes collaboration through facilitation of Special Interest Groups (SIGs) in priority academic areas, discovery of active researchers/faculty, provision of research and education grants to researchers and member institutions, as well as travel grants for faculty and/or graduate students in SIG areas.

This call seeks innovative approaches to engineering and computer science education leading to improved learning outcomes. In particular we seek proposals that will ensure students:
1. Gain experience in deploying real world engineering and software systems
2. Get adequate systems design experience
3. Get exposure to cutting edge technology including but not limited to
   a. Machine learning
   b. Embedded systems programming
   c. Renewable energy
   d. Water resource management
   e. Robotics and drones
4. Get experience in use and development of appropriate software tools
5. Learn to work effectively in teams
6. Learn effective communication skills

In addition, we seek proposals that suggest ways to rapidly review engineering and computer science curricula to incorporate the new digital skills requirements.

Education Technology innovation Grants: Areas of Focus

The areas of focus for this round of innovation grant funding are:

i. **Innovations in Engineering Education** (IEE) and
ii. **Innovations in Computer Science Education**. (ICSE)

Grant Structure, Objectives and Schedule

KENET Innovation Grants Structure

1. Two (2) innovation grants will be awarded per area of focus. A total of four (4) innovation grants will be awarded for the 2019/2020 round of funding.
2. Each innovation grant will be for a maximum of KES 1.5 million
3. The grant period is 12 months.

Areas of Focus: Objectives

1. Innovations in Engineering Education

Proposals in this focus area will develop new teaching approaches in any of the engineering degree programs approved by the Engineering Board of Kenya. Ideally, the proposals shall aim to develop new teaching materials and methods for a core course in the chosen discipline. This material will focus on real world problem solving and make extensive use of blended learning approaches.

2. Innovations in Computer Science Education

Proposals in this focus area will ideally lead to exposure in the development of complex computer systems such as through improved exposure to software engineering methodology. In addition, we welcome innovative hands-on approaches that aim to achieve learning outcomes in foundational computer science areas and that make extensive use of blended learning approaches.

Schedule:

Table 1 shows the innovation grant's call timeline.

Activity	Dates
Call for proposals open for submissions	January 8 – February 7, 2020
Review and evaluation of received proposals	February 10, 2020 to February 28, 2020
Face-to-face presentations of shortlisted applicants	Early March 2020
Finalists announced and innovation grants awarded	End of March 2020
Grantees on-boarding	Early April 2020

Implementation period	May 2020 to May 2021
Evaluation, reporting and close-out	June 2021

Table 1: Call Timeline

Eligibility, Terms and Conditions

Eligibility

Applicants must
1. Have at least two years teaching experience in an accredited engineering or computer science program at a Kenyan university.
2. Have at least an MSc in one of the engineering disciplines or computer science.
3. Have published work in peer reviewed journals and conferences indexed in Scopus or Web of Science in the past 12 months.
4. Obtain written approval from Head of Department and Dean/Director of respective schools of engineering or computer science.

Post-Award Requirements

The successful grantees will be expected to:

1. Provide quarterly progress reports to the Education Technology research associate at KENET
2. Participate and present project work at selected meet-ups organized by KENET
3. Grow a community of improved teaching practice.
4. Actively seek funding to further their research work by writing (joint) funding proposals to other agencies
5. Prepare a final project report at the end of the grant period and submit to KENET
6. Prepare an abridged version of the project report for profiling on KENET's and institutional websites.
7. Publish paper(s) on their work in reputable journals. These papers should acknowledge the KENET grant.

Proposal Submission

We expect proposals to include the following sections;
1. Abstract (200 words)
2. Focus area. Either Innovations in Engineering Education (IEE) or Innovations in Computer Science Education. (ICSE)
3. Justification - this section should introduce the subject area where the teaching innovation will focus and relate it to the core engineering or computer science curriculum. In addition it should explain the proposers teaching experience and the shortcomings in current teaching methods. It should include the opportunities

3

for improvement. (300 words)
4. Methodology - Clearly explain your approach to develop and deliver the course content. Where appropriate, cite appropriate literature. (400 words)
5. Content development and sharing statement - we expect all content developed as part of this grant to be freely available and archived in a public repository. Include a statement on how you will make the content developed available. (100 words)
6. Student evaluation statement - (100 words)
7. Timeline
8. Budget (Up to KES 1.5 million) and budget justification.

Proposals must adhere to the word limits stated and must not exceed 4 pages including figures and references.

To give your proposal a good chance of success, we would like to stress the importance of clear and concise writing. We also recommend the following resources:
1. Kraicer, J. (1997). The art of grantsmanship. *Online:* https://medecine.umontreal.ca/wp-content/uploads/sites/8/2015/01/CatalogueAteliersFacMed_ICM_Annexe1.pdf
2. Bourne, P. E., & Chalupa, L. M. (2006). Ten simple rules for getting grants.

Supporting Documents
The following documents should be included as part of the proposal submission:

1. Team profile document, indicating the names, institutional affiliation and brief biographies of the lead researcher(s). Details of other team members and any collaborating institutions should also be included in the team profile.
2. CVs of the lead researcher(s), clearly profiling research activities undertaken to date as well as relevant publications.
3. Letters of Commitment from team members and any collaborating institutions.

Proposal submission
Proposals with all supporting documentation should be sent via email to edutechgrants@kenet.or.ke on or before February 7, 2020, 11.00 PM East African time

Enquiries and applicant support
All enquiries and requests for further information related to this call should be addressed to grantsadmin@kenet.or.ke .

Proposal Evaluation

Evaluation Criteria

Proposals will be evaluated on
1. Ability to deliver improved learning outcomes

2. Team composition with demonstrable ability to develop and deliver the course content
3. Approaches to monitoring and evaluating students
4. Integrity - plagiarism and other forms of academic fraud will be grounds for disqualification.
5. Appropriate use of technology for content delivery and sharing
6. Capturing and integrating student feedback
7. Use of appropriate pedagogical approaches
8. Commitment to gender equality
9. Sustainability

Table 2 shows elements of this evaluation in greater detail.

Evaluation Criteria	Evaluation Aspects	Weighted Score
Justification	Is the proposed course content in a core engineering or computer science discipline? Does the proposer have experience teaching the course? Does the proposed work address a real shortcoming in current teaching approaches?	10%
Learning outcomes	Are the learning outcomes clear? Will the developed program yield improved learning outcomes?	30%
Team composition	Does the team possess the technical skills in the area of focus? Does the team possess the requisite teaching experience in the focus area? Does the team have an appreciation of developing curricula?	20%
Student focus	Is the monitoring and evaluation of student clear? Is the mechanism for collection of student feedback clear? Will students develop improved skills?	10%
Community engagement	Will the team create a community of practice in the chosen discipline? Will the team share content and learnings? Is the mechanism for dissemination clear?	10%
Sustainability	Is there potential for future funding?	10%
Scalability	Can the content developed be delivered to large class sizes?	10%

Table 2: Evaluation Criteria

Evaluation Process

1. KENET will constitute a review panel of leading engineering and computer science experts. Members of the review panel will sign Non-Disclosure Agreements, as well as statements acknowledging that they will make no claim to the intellectual property developed by the grantees.

5

2. The reviewers will review all received applications as per the evaluation criteria provided in Table 2, and select the top 3 proposals for each area of focus.
3. The top three (3) finalists in each area will be invited for a final face-to-face presentation. During the oral presentations, the applicants will respond to and clarify any questions from the panel that will have arisen out of their written submissions. They will also be required to respond to any ad-hoc questions arising from the oral presentation.
4. After the oral presentations, the reviewers will make their final decisions on which two proposals will receive the innovation grant, per area of focus. Four (4) teams will be selected.
5. Selected grantees will be notified formally and profiled on KENET's website.