

Abstract: Didactics for Contemporary physics and modern physics teaching at Strathmore University (Nairobi-Kenya)

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Strathmore University is a chartered university based in Nairobi, Kenya. Strathmore College which became a university was started in 1961, as the first multi-racial, multi-religious advanced-level sixth form college offering science and arts subjects, by a group of professionals who formed a charitable educational trust.

With this, Strathmore believes its fourth generation stratizens will successfully balance their roles as players in the extremely globalized higher education marketplace with their contribution to the economic and social development of their countries of Eastern Africa (Kenya, Uganda, Tanzania, Rwanda, South Sudan and Burundi) and nearby regions (DR Congo, Ethiopia, Central Africa Republic).

The university strategic plan focuses on: digital transformation, continuous quality improvement, internationalizations, strategic collaboration and partnership, vibrant alumni engagement and data analytics. The process of mainstreaming them will involve flexibility, learning and acceptance of new norms. This will also facilitate translating the strategies into actions and creating departmental operation implementation plans to guide and align our efforts. Our actions will be guided by responsible leadership that is accountable for budget and progress. The university will track our progress against the objectives of the strategic plan and will check and revise our direction and focus in response to changes both within and beyond the University [**Starthmore2015**].

In response to the strategic plan, the university launched the School of computing and engineering sciences (SCES) in 2020 and started Bachelor of science in Electrical and Electronic Engineering (Bs EEE) the year. It's a five-year program with the aim of developing well and accomplished engineers for East Africa and the regions.

The program curriculum has various detailed courses running from year one to five, the first class started in January 2021 with 28 students first intake and the second intake in July which brought the number up to 86 students.

The emphasis is not on the student “calculatory” skills, but rather on a chain of reasoned investigation. This can be performed within a learning environment aimed at supporting

a valuable understanding of the physics concepts underlying the complex world of semiconductor electronics. The second learning path is a 5E-cycle-based workshop of advanced physics targeted to strengthen student's understanding of the various aspects of the **Photoelectric Effect**.

In this latter, the instructors stimulate a discussion on the different atomic modeling (classical and quantum)

In addition to the calculatory aspects involved in a quantitative description, we motivate the students with an evaluation by the peers during a presentation.

The findings show that the stimulated activation of the inquiry process, an effective teaching/learning method, complementing the use of numerical simulations.

This approach successfully engages students into active learning and, at the same time, supports the clarifying of important experimental and technological aspects of material science, representing a feasible example of combination of a traditional lecture-based teaching method with efficacious teaching/learning strategies.

The students were divided into a group of four and each member of the group assigned a management role (leader, theoretician, experimentalist, and communication). The students were told to come up with the topic in modern physics for the discussions under their leader, after identifying the topic, they were to develop the theoretical explanation under the guidance of the theoretician, after the theoretical development, the students were to set up the experiments for the experimental investigation. This methodology is different from the previous work published in 2015 [Dillmann2015], on a Nuclear Magnetic Resonance setup, and proved to improve the concern of the students for an inquiry-based approach.

Bibliography

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