

# Kaleidoscope: Bridging the visual gaps between terminologies and their implications in Investigative Medicine

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## Introduction

The paradigm shift of medical education from being teacher centred to student centred and the practice of medicine from a doctor centred to a multi-disciplinary approach is here to stay. It is increasingly clear that although students appreciate the need for direction, they are comfortable with accepting responsibility towards the management of their own learning resources. Learning and participation are inseparable (Wlodkowski, 2003). Imparting the nuances of disease processes related to certain organ systems using didactic lecture formats do not appear to enhance the understanding of applied concepts and sustain interest among undergraduate medical students. A learning approach that keeps student interest on-going, encourages self-direction and interaction, and expands problem solving skills though difficult to develop, is ideal. Reflective thought combined with computer aided teaching, is a more effective way of teaching (Dutta, 2011) and introduces increasing levels of clarity and uniformity in teaching.

The authors planned 'Kaleidoscope' - two computer aided teaching sessions with the objective to steer students towards acquiring important terminologies from laboratory reports, establishing visual connections between those terminologies, the diagnosis and the disease process and translating the information into making inferences from descriptive simulated hospital laboratory reports.

This forms the backbone of the curriculum of the Clinical Sciences and Investigative Medicine module in the fourth year undergraduate medical teaching of Newcastle University Medicine, Malaysia (NUMed). Ensuring closure of loops between pathology teaching in the preclinical years and the application of these concepts to the ever expanding role of investigative medicine was the mainstay for the development of this method of learning. The intended sessions were planned and perceived as a hybrid between the didactic lecture and small group syndicated learning.

## Methods

This study piloted an innovative technique 'Kaleidoscope' using referenced pictures and photographs collated into a PowerPoint format to reinforce terminologies related to haematology and renal medicine. Twenty year four undergraduate medical students attended two such sessions at NUMed. Each student was equipped with a personal computer (PC) and the pre-prepared PowerPoint resource which was open to editing. The main PC manned by the lecturer was connected to wall mounted display terminals. All concepts included in the resource were an integral part of laboratory reports and reflected the involvement of the organs in intrinsic as well as systemic diseases. The resources were planned to escalate in levels of difficulty so that the students were challenged to make connections between terminologies and laboratory diagnosis. The last few pictures were unreferenced and provided students with the opportunity to test their skills and the lecturer to test and teach high order learning.

While the lecturer driving the session imparted techniques related to identification of commonly encountered pathognomonic structures used for diagnosis, students could make notations and additions to enhance their own understanding. A second lecturer moved between students to help them with

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identification issues. A non-content expert observed the renal session independently. Students were encouraged to express their

### **Observations and discussion**

All students showed willingness to attend the sessions both of which were optional. They participated with enthusiasm, displayed eagerness to learn and freely asked questions as the session progressed from simple and elementary pictorial references to more complex interrelated concepts. Students readily made their own notations on pictures and comfortably typed out the lecturer's explanations in their own style in an effort to build resources towards independent revision sessions. As part of a qualitative feedback, 90% of students felt that the level of difficulty and the pace of the session were optimal and facilitated a smooth learning curve. 10% of students felt that the content could be spread over two separate sessions. Students observed that the concepts learned during these sessions could be translated into better understanding of other topics related to renal medicine and haematology.

The lecturers noted that the sessions created a relaxed atmosphere within the class where the transfer of information moved from being hierarchical to interactive and flexible.

views on how much they benefitted from such sessions and whether or not the process fostered independence and self-direction. Students progressed comfortably from level to level and were able to successfully mind map when faced with the test and teach portions of the resource.

The observer noted that such an innovation comfortably managed to integrate interaction, high order learning and problem solving while successfully breaking down learning barriers between lecturer and students.

As a future direction to 'Kaleidoscope', it will be interesting to apply this learning technique to larger student groups in the other years of pathology teaching while eliciting a structured quantitative feedback on effectiveness of such sessions within a bigger cohort.

### **References**

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