



ICCE 2016

**24th IUPAC
INTERNATIONAL CONFERENCE ON
CHEMISTRY EDUCATION (ICCE) 2016**

incorporating

**INTERNATIONAL SYMPOSIUM ON
PURE & APPLIED CHEMISTRY (ISPAC) 2016**

&

LABASIA BORNEO 2016

**SOUVENIR PROGRAMME &
EXHIBITION DIRECTORY**

15 – 20th August 2016

**Borneo Convention Centre Kuching
Kuching, Sarawak, Malaysia**

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POT01

A Research Based Design for Teaching Phases of Matter and Heat to Visually Impaired Students

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The students who are blind or visually impaired will typically need variety of assistance to explore and examine real materials or models together with some adaptations in the environment in order to let students having safe and full access to science. They must be exposed to a variety of experiences in science that can reasonably be explored. The students' visual needs should be taken into consideration when designing instruction. Science materials may include talking devices, tactile charts, reading materials, and equipment. But traditionally science teaching mostly depends on visual instruction. This makes science learning difficult for visually impaired students. Distinction must be made between compensatory skills and functional skills so that students with visual impairments can access the expanded core curriculum in addition to the core academic curriculum of general education.

In this design based research (DBR), we developed an instructional design to narrow the gap between theory and practices. DBR is a type of research methodology commonly used by researchers in the learning sciences in which interventions are conceptualized and then implemented iteratively in natural settings in order to test the ecological validity of dominant theory and to generate new theories and frameworks for conceptualizing learning, instruction, design processes, and educational reform.

The study was carried out in three steps. In the first step, by an embedded single-case design, visually impaired students' individual needs have been identified in terms of scientific process skills and conceptual understanding regarding "Phases of Matter and Heat". In the second step, instructional materials and activities were designed in the direction of students' individual needs. In the last step, also an embedded single-case design was used to evaluate the instructional materials that are designed for teaching particulate nature of matter to visually impaired students in term of practicality, applicability and shortcomings.

Nine students including three totally blind were participated the study. After four weeks of implementation, academic achievement test and semi-structured interview form were used as a data collection tools to determine effectiveness of instructional design on students understanding and conceptual learning. The data is under analysis stage currently. The findings will be presented at the conference.