

USING RASCH ANALYSIS TO EXPLORE WHAT STUDENTS LEARN ABOUT PROBABILITY CONCEPTS

Zamalia Mahmud¹, Anne Porter²

¹Faculty of Computer and Mathematical Sciences, Universiti Teknologi MARA, Malaysia

²School of Mathematics and Applied Statistics, University of Wollongong, NSW Australia
e-mail: zamalia@tmsk.uitm.edu.my

Abstract

Students' understanding of probability concepts have been investigated from various different perspectives. This study was set out to investigate perceived understanding of probability concepts of forty-four students from the STAT131 Understanding Uncertainty and Variation course at the University of Wollongong, NSW. Rasch measurement which is based on a probabilistic model was used to identify concepts that students find easy, moderate and difficult to understand. Data were captured from the e-learning Moodle platform where students provided their responses through an on-line quiz. As illustrated in the Rasch map, 96% of the students could understand about sample space, simple events, mutually exclusive events and tree diagram while 67% of the students found concepts of conditional and independent events rather easy to understand.

Keywords: Perceived Understanding, Probability Concepts, Rasch Measurement Model

Abstrak

Pemahaman siswa terhadap konsep peluang telah diteliti dari berbagai perspektif yang berbeda. Penelitian ini dilaksanakan untuk menyelidiki pemahaman yang dipersepsi oleh empat puluh empat siswa tentang konsep peluang dari perkuliahan STAT131 Memahami Ketidakpastian dan Variasi di University of Wollongong, NSW. Pengukuran Rasch yang didasarkan pada model probabilistik digunakan untuk mengidentifikasi konsep yang mudah, sedang dan sulit dimengerti oleh siswa. Data diambil dari platform Moodle e-learning dimana siswa memberikan tanggapan mereka melalui kuis on-line. Seperti digambarkan dalam peta Rasch, 96% siswa dapat memahami tentang ruang sampel, kejadian sederhana, kejadian saling eksklusif dan diagram pohon sementara 67% siswa mudah memahami konsep kejadian bersyarat dan independen.

Kata Kunci: Pemahaman yang Dipersepsi, Konsep Peluang, Model Pengukuran Rasch

Statistics is an important element of the curriculum for students in a variety of majors. Increasingly elements of data analysis and probability are also being emphasized in industry in a variety of disciplines including engineering and computer science. It is becoming increasingly prevalent as students are required to learn the skills of statistical reasoning and develop the ability to translate information (Jensen & Kellogg, 2010).

Students' difficulties in learning and understanding probability have been known from several research studies and have been well documented (Garfield, 2003; Shaughnessy 1992; Konold, 1989; Garfield & Ahlgren, 1988). According to Garfield and Ahlgren (1988), students have an underlying difficulty with fundamental ideas of probability. Apart from their weakness with rational number concepts and proportional reasoning (Matthews & Silver, 1983), probability ideas appear to conflict with students' experience about how they view the world. In a recent study, Zamalia *et. al.* (2013)