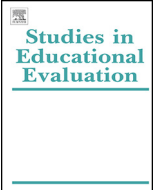




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Using teacher judgment for placement in college mathematics courses: An ethnographic case study at one Midwestern institution

Victoria Ingalls*

Department of Natural and Formal Sciences, Tiffin University, 146 Clay Street, Tiffin, OH 44883, USA

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ABSTRACT

The purpose of this ethnographic case study was to understand the process of making student placements into the mathematics curriculum at one Midwestern university. Historically, the department chair has used an expert teacher's intuitive-based judgment process to assess multiple academic documentations, rather than a more structured method for evaluating multi-faceted evidence of student ability. These measures include, but are not limited to, the ACT Mathematics sub-score (ACT-M), mathematics background, high school transcript, and high school grade point average (HSGPA). Though somewhat archaic, the process was highly individualized, flexible, and highly accurate for this particular institution. As many institutions collect similar information, the impact of using a flexible hierarchy of multiple measures may be applicable to other university's mathematics programs.

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Introduction

Proper placement into courses and programs of study is pivotal for the success of students across universities of all sizes and demographics. The essential dilemma is an appropriate evaluation of mathematical ability of incoming freshmen in order to place them accurately into either the developmental or standard curricula (Jacobson, 2006; Van der Linden, 1998). Other recent studies suggested that most post-secondary schools rely on a nationally recognized measurement of college readiness such as the American College Test (ACT), Scholastic Aptitude Test (SAT), or another standardized assessment for mathematics placement (Donovan & Wheland, 2008; Foley-Peres & Poirer, 2008). In contrast, this study approaches initial mathematics placement from a multiple measured and subjective perspective.

Johansson and Kroksmark (2004) stated that "experience as recognition is closely connected to intuition-in-action" (p. 365). These authors also stated that intuition is known and used throughout the world; teachers in their study described intuition as something unconscious, spontaneous, and physical. Intuition led teachers to determine various educational situations, from what grade to assign to what works in the classroom when the lesson plan goes array (Eraut, 2000; Johansson & Kroksmark, 2004).

The judgments tended not to be made on a rational, systematic basis, but were often formed rapidly and intuitively. Harteis and Gruber (2008) described three different forms of teaching intuition which were demonstrated by knowing how to act, having a sudden inspiration, or general gut feeling.

Berliner (2001) affirmed that expert teachers used higher order systems of categorization to efficiently access knowledge and relied on self-regulatory and meta-cognitive capabilities unclaimed by the less experienced teachers. In contrast to novice teachers, the expert teachers were faster and more accurate in pattern recognition, allowing for knowledge and skills to transfer across domains and contexts into novel circumstances (Berliner, 2004). However, lengthy time-commitments were needed to attain the domain-specific, contextualized knowledge base necessary for expertise in pedagogy (Berliner, 2004; Harteis & Gruber, 2008).

"Expert pedagogues, like experts in many other fields are likely to excel in their own domains and in particular contexts within that domain" (Berliner, 2004, p. 203). Research in medicine and law where assessments of the situations were made quickly suggested that professionals tended to make decisions based on judicious hunches rather than objective information (Eraut, 2000; Madelaine & Wheldall, 2005) or mechanical mathematical modeling (Ægisdóttir et al., 2006; Grove, Zald, Lebow, Snitz, & Nelson, 2000). The core reliance on clinical judgment, or clinical wisdom, refers to the typical procedure long used by psychologists and physicians where informal, subjective judgments are made

* Tel.: +1 419 448 3396.
E-mail address: ingallsv@tiffin.edu

(Grove et al., 2000). In short, experts organized the information in an elaborate schema (Berliner, 2004), and had greater understanding of how and why they made certain decisions (Berliner, 2001).

The debate between clinical and mathematical judgment has raged on for decades. Although two major meta-studies (Ægisdóttir et al., 2006; Grove et al., 2000) demonstrated the higher accuracy rates of using statistical regression, Carroll (2009) asserted that clinical decision-making should acknowledge both the value and limitations of intuitive approaches in dealing with complex dilemmas. For example, the research by Grove et al. (2000) stated, “In half of the studies we analyzed, the clinical method is approximately as good as mechanical prediction, and in a few scattered instances, the clinical method was notably more accurate” (p. 25). While regression modeling described the process through mathematics, researchers have neither adequately studied the process of making judgments (Madelaine & Wheldall, 2005) nor reconstructed the process of insight (Harteis & Gruber, 2008).

Theoretical significance of the study

The nature of the inquiry “What is the process of making students’ mathematical course placements using informed teacher judgment?” justified a qualitative approach. Within a post-positivist perspective, the ethnographic case study utilized the direct, personal authentic experiences of the single voice with respect to the process of making placements based upon informed teacher judgment. This approach allowed for a rich, in-depth portrait to emerge of one department chair’s reliance upon intuitive judgment to place students into entry-level math courses at a small Midwestern institution. Moreover, the epistemology associated with the study provided the opportunity to address a gap in knowledge and add to the available body of literature on placement options, as well as to inform practice (Creswell, 2005) in placement processes for college students.

Inasmuch as this study may influence the future practices of mathematics course placements for students in generations to come, this research also attached itself to much larger issues of universities throughout the nation. In short, the larger issues of multiple sources versus any singular piece of data and objectivity versus subjectivity in placement judgments were exposed. Within that context, the qualitative human factor appeared to provide a rich context for judgment within its multiple measures of student achievement. In their search for the best way to place students into their initial mathematics course, schools of comparable size and demographics may align themselves to the context of this study and accept the results offered by this research to direct their own placement practices.

Methodology

Participant

As required by the nature of ethnography, this research derived its data from the comments made during interviews and observations. The principle participant in this case study was Professor Jane Smith. As the Mathematics chairperson at her small, Midwestern university, she has been involved with the placement of the students at this university for the last 20 years. The entirety of the results centered on her comments.

Data collection

The mathematics department chair granted multiple interviews in her office during the 2008 spring semester, prior to the first 2009 freshmen orientation. As prescribed by Seidman (2006),

each of the three sessions lasted approximately 90 min and loosely followed a prescribed interview protocol. Moreover, using Creswell’s *Qualitative inquiry & research design: Choosing among five approaches* (2007) as a model, I also conducted an ethnographic study of informed teacher judgment with respect to student folder analysis. In this portion of the research, I became an apprentice in the analysis of student folders. Each folder contained an ACT record, high school transcript, and Ohio Graduation Test (OGT) results or another state’s exit measurement. The admissions office provided a list of each group scheduled in the five orientation sessions. All of the one-on-one interviews and ethnographic situations were audio-taped with permission and transcribed verbatim when appropriate. Additionally, copies of the placement changes from ACT-M were retained with explanations of the reasons for each change.

Data analysis

The qualitative research genre necessitated an inductive analysis of repetitive thematic phrases from the individual interviews. The process of triangulation was done to provide corroborating evidence and further illuminate the major interview topics (Seidman, 2006). Qualitative validity was established through member checking of the recurring interview themes as well as documentary evidence (Creswell, 2005) such as high school transcripts and ACT results.

Results

The study set out to answer the following research question: what is the process for using teacher judgments to make initial mathematics course placements? Professor Jane Smith answered the proposed interview protocol and allowed for apprentice-like observations during the placement process at the university. During the course of the month-long ethnographic study, her responses, explanations, and elaborations mapped into the five major themes given below.

Theme 1: institutional history of placement

She explained to me that she had been at the university for about twenty years and had served as the department chair since the inception of the position, about twelve years ago. During that time, the university maintained three tiers of entry level coursework. That is, a student could begin at Foundations of College Mathematics, a remedial course for students who possess very poor arithmetic skills. The second option was for Beginning Algebra. In this second level, students learn or relearn basic Algebra skills that were necessary for success in the standard course. As developmental courses, the above-listed curricula did not count as hours or quality points toward the Baccalaureate degree. The third level of coursework consists of two classes: Finite Math and College Algebra. This last tier of coursework had academically equivalent classes, chosen according to the student’s major. Either class fulfilled the graduation requirement for the standard (i.e. non-remedial) level of mathematics courses, and served as a pre-requisite for Applied Statistics, a sophomore level class. Professor Smith commented that other schools “just have one math class that everybody takes...It is a do or die situation,” but for this college, “there is no one class that everyone takes.”

She recalled that the university had “done a lot of different things” to place students into the beginning math courses at the institution. The first method that she spoke of was a seated placement test during orientation. “When I first got here they would take a test during orientation. It would get scored and then according to that score, that is where they would be placed.”

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