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## **Preservice teachers' observations of their mentors' teaching strategies for differentiated learning**

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### **Abstract**

Tensions exist between teacher-centred and learner-centred approaches with constructivism as being favoured for learning in the 21st Century. There is little evidence of teaching strategies being used in the field for differentiating student learning. In addition, preservice teachers need to learn about teaching strategies for which observations of their mentor teachers can provide practical applications. This study explores 16 preservice teachers' observations of their mentors' teaching strategies over a four-week professional experience. They provided a minimum of five written observations during this period. Findings indicated that these preservice teachers observed their mentors' practices and recorded four key teaching strategies used to differentiate learning, namely: (1) designating facilitators for students' learning, including teacher, peers, parents, and support staff such as teachers aides, (2) managing student groups, (3) contexts for learning, and (4) using a range of teaching aids (visual, auditory, games) and resources. Preservice teachers' observations of their mentor teachers indicated that they can commence at early stages for identifying teaching strategies and how they work for differentiating student learning.

**Keywords:** teaching strategies, learning approaches, teaching approaches

In the 20<sup>th</sup> Century, educators began to discuss the move from a subject-centred focus to one more student centred, as tensions between the evidence of effective learning and the heavily prescribed content-based approach began to build (Vermunt & Verloop, 1999). Traditional teacher-centred approaches placed emphasis on the actions of the teacher, and the learners as recipients of a "fixed body of knowledge", consequently, an alternate approach needed to

consider learning to be less linear and more relational (Biddy, 2009). Different theories for teaching and learning began to emerge, leading to significant educational reform (Zufiaurre, 2007). The pedagogical challenge for teachers included the identification of strategies that enabled the movement from “transmission of knowledge to supporting and guiding self-regulated knowledge construction” (Vermunt & Verloop, 1999, p. 258).

Empirical evidence is sought to determine and validate pedagogical approaches that progress from passive learning and teacher-directed approaches to active student participation through the construction of knowledge (Vermunt & Verloop, 1999). The recognition of learner-centred strategies supported the view that the purpose of education should be more closely aligned with students’ ability to access knowledge rather than its delivery by the teacher in a transmissive model (Zufiaurre, 2007). This infers that teachers need to understand the processes of facilitating learning through effective teaching strategies. Indeed, the provision of content does not guarantee that learning will take place; therefore how activities are facilitated may influence the quality of learning (Vermunt & Verloop, 1999).

The *Queensland School Reform Longitudinal Study* identified a set of “Productive Pedagogies” (Lingard et al., 2001) which outlined recommended teaching practices based on many years of research in Queensland classrooms. Described by Field (2003) as an approach to teaching and learning that “recognises the importance of the role of the teacher, but which at the same time sees student learning as paramount in what schools should be aiming to achieve” (p. 2), the Productive Pedagogies framework can re-focus pedagogical practices. Although not specifying or recommending particular teaching strategies, the research conducted provides evidence that high-quality teaching involves the use of pedagogical strategies to support intellectual engagement and focus on establishing connectedness to meaningful contexts, in an environment where learners’ differences are recognised and valued (Field, 2003; Lingard et al., 2001). Lingard et al. (2001) also advise that teachers need to consider the student contexts and their preferred learning styles in order to select appropriate teaching strategies.

Despite new frameworks for teaching (e.g., Lingard et al., 2001), questions continue to arise around what constitutes effective practice. In considering this in terms of actual teaching strategies, two schools of thought tend to be represented. On one side there exists an argument for teacher directed and explicit teaching of concepts rather than the discovery of

new information by students (Kirshner, Sweller, & Clark, 2006; Magliaro, Lockee, & Burton, 2005). Alternately, learning generated by students, with the teacher as facilitator can allow students to construct new knowledge (Kirshner et al., 2006; Scarff Seater, 2003). More tension arises in deciding on teaching strategies with a call for a back-to-basics approach to teaching, largely based on teacher-centred strategies, instead of curricula enriched with critical thinking approaches (Mills et al., 2009).

One particular teaching strategy that reports to facilitate student learning has been labelled “Problem Based Learning” (PBL; Barrows & Tamblyn, 1980) or “Inquiry Based Learning” (Rutherford, 1964), which emanated from Dewey’s (1933) guided discovery and reflective thinking approaches. Researchers (Schmidt, Loyens, Gog, & Paas, 2007) supporting the notion of PBL claim that its characteristics provide for “flexible adaptation of guidance and management of the cognitive load” (p. 95). Supovitz, Mayer, and Kahle (2000) support the strategy saying it is “a student-centred pedagogy that uses purposeful, extended investigations set in the context of real-life problems as both a means for increasing student capacities and as a feedback loop for increasing teachers’ insights into student thought processes” (p. 332). Opponents of PBL or inquiry-based learning claim this strategy is ignorant of human cognitive architecture, disregarding the influence of working, including short-term and long-term memory on learning (Kirshner et al., 2006).

In seeming opposition to evidence that learner characteristics play an important role in the selection of teaching strategies, one particular strategy has continued to be researched and debated since its first description in the 1970s, reportedly with positive results. Direct Instruction (DI), as introduced by Rosenshine (1976), continues to be rationalised and offered as an example of a teaching strategy worthy of use (Stein, Carnine, & Dixon, 1998). Stein et al. define DI as “a comprehensive system of instruction that integrates effective teaching practices with sophisticated curriculum design, classroom organisation and management, and careful monitoring of student progress” (p. 227). Arguing that DI is different from traditional teacher-directed approaches in that it provides important links, practice and support for students as they apply new knowledge; however misconceptions have persisted due to teachers’ application of some less pertinent features of this strategy (Stein et al., 1998). Yet there are few studies that investigate the effects of specific teaching strategies that teachers select for their students’ learning.

In a study conducted by Bender and Ikechukwu (1989), 50 teachers were asked to about their educational and teaching experience as well as their attitudes towards teacher effectiveness in an attempt to “demonstrate relationships between these variables and teacher’s selections of teaching strategies” (p. 23). Data indicated that “the relationship between learning strategies and years of teaching experience suggests that more experienced teachers may emphasize cognitively based learning strategies less frequently than younger teachers” (p. 28). Bender and Ikechukwu theorised that this could be due to cognitive learning theories introduced into preservice teacher education programs. Additionally, the researchers found that “teachers’ use of effective instructional strategies has been consistently related to teacher attitudes concerning personal teaching effectiveness and, to a lesser degree, with limitations of the effectiveness of teaching” (p. 28). A further study by Marshall, Horton, Igo, and Switzer (2007) investigated 1,222 K-12 mathematics and science teachers’ beliefs about inquiry in the classroom. Of interest in terms of the selection of this inquiry-based learning was that “self-efficacy for inquiry teaching, level taught, and support structure were three areas identified that relate significantly to the percentage of time devoted to inquiry during a typical lesson” (p. 591). It was also determined that the highest percentage of teachers implementing and valuing the use of inquiry were primary teachers. Indeed, primary teachers may have more flexibility in their school timetable to pursue inquiry-based learning, whereas their secondary counterparts may experience “a greater need to impart learning in less inquiry based formats, perhaps opting for what they view as greater efficiency, rigor, test preparation, and transmission” (p. 594).

The Australian Council of Deans (2001) outline that 21st Century learners need to “navigate change and diversity, learn-as-they-go, solve problems, collaborate, and be flexible and creative” which impacts on selecting particular teaching strategies (p. 2). Research around the concept of teaching for understanding appears to consider the advantages of both cognitive and constructivist teaching strategies and warns that “since understandings cannot be transmitted, merely telling children the relationships in some topics seems unlikely to provide much of a press for understanding” (Newton, 2001, p. 121). Alton-Lee (2003) identified that one essential element of quality teaching was the teacher’s knowledge of pedagogical practices that facilitates “classes and other learning groupings to work as caring, inclusive and cohesive learning communities”, as well as the inclusion of scaffolding, feedback, metacognitive strategies and thoughtful discourse (p. 22). Importantly, research-based evidence must be at the forefront for advancing teachers’ practices; as Carnine (2000) asks,

“If we don’t know what works, how are teachers to know how to respond in a sure and confident way to the challenges they face?” (p. 3). It appears that teaching strategies may be at the centre of effective learning, yet little is known about what specific strategies are being selected by teachers and for what purposes. This study explores 16 preservice teachers’ observations of their mentors’ teaching strategies over a four-week professional experience. The research question for this study was: what teaching strategies do preservice teachers observe of their mentors for differentiating student learning?

### *Context*

The 16 second-year preservice teachers involved in this study attend a small university campus offering a Bachelor of Education (BEd) for primary teaching. A demographic survey was administered to these participants comprising 40% of the total number of second-year preservice teachers. Within the cohort of second years there were 36% who had children of their own, 43% who were first in their families to attend a university, 46% with part-time jobs, and 71% indicating proximity of the university to home as the reason for studying at the university campus. These second-year preservice teachers had completed eight units of study in their first year, including an introduction to education, learning networks, Indigenous education, and three curriculum units (literacy, science and mathematics, and health and physical education). Before commencing their first professional school experience, these preservice teachers also had completed a unit on student development and learning and two more curriculum studies (dance and drama, and primary science education). Their practicum unit is scaffolded through the semester leading to the practicum experience, which occurs towards the end of their first semester when they are placed in participating local primary schools.

### **Data collection methods and analysis**

This case study involved 16 second-year preservice teachers completing their first four-week practicum experience. During their practicum, these preservice teachers were expected to write a minimum of five observations and/or reflections of their mentors’ teaching practices. After university ethics was secured as part of the Teacher Education Done Differently (TEDD) project, consent was gained from 16 of the 40 preservice teachers to participate in this study. Their written documents presented observations of their mentor teachers’ strategies considered to be effective, including the selection of teaching strategies for

differentiation. Written documents were scanned and printed for coding and analysis. A constant-comparative method was used to collate data into themes (Strauss & Corbin, 1990).

## **Results and discussion**

The second-year preservice teachers presented written observations of teaching strategies for differentiated learning. Using the constant comparative method, participant responses on specific teaching strategies used by their mentor teachers were collated into four main themes, namely: (1) human resources to act as facilitators for differentiated learning, (2) classroom management, particularly managing student groups and activities, (3) contexts for differentiated learning, and (4) resources and teaching aids.

The preservice teachers wrote about how their mentors used various facilitators as a teaching strategy for differentiating student learning. These human resources included students, parents and school support staff such as a teacher's aide. For instance, there were four preservice teachers who observed that their teachers enlisted students in the class as "expert helpers" and as a result the "students seemed to be thoroughly engaged and enjoying what they were doing... there were also very few behaviour issues". Two mentioned the use of other personnel to support students' learning including the use of teacher aides who work one-on-one with students with special needs and co-teaching arrangements, as it "works well for structure and consistency". Importantly, the teacher was referenced as the main facilitator who strategised in working with students of varying abilities and needs.

Differentiation of learning by grouping students was a teaching strategy eight of the preservice teachers had observed. For example, one preservice teacher explained how the teacher would work with the lower-ability students while other students worked in groups, and another stated, "My teacher doesn't spend much time at the front of the classroom, and the students know what to do". This class management differentiation appeared in varied forms such as one-on-one assistance, recognition of learning styles (e.g., visual, kinaesthetic), and students' learning needs aligned with Gardner's Multiple Intelligences (see Gardner & Hatch, 2004). There were students with disabilities where one-on-one assistance was essential: "I had an experience with a child that has a hearing problem and so I explained how to do a task to this child on a one on one basis". An additional three preservice teachers presented differentiation of learning through their teachers' arrangement of student activities around levels of thinking skills where, for instance, students are provided learning tasks

according to their zones of proximal development (ZPD, see Vygotsky, 1978). The mixed grouping was observed as way for their mentor teachers to target different student needs such as: “working in small groups on literacy worksheet with the lower-order thinkers, to help and encourage their learners”.

It was evident that their written observations had a mix of teacher and student-centred strategies as part of managing activities for differentiating student learning. One preservice teacher explained that her teacher “incorporates lots of hands on activities... uses songs and rhymes... and group work activities”, and wrote that her “teacher mixes student and teacher led approaches, and uses lots of questioning techniques”. Two preservice teachers indicated hands-on prior knowledge activities as a teaching strategy. To illustrate, one preservice teacher recounted a prior knowledge activity presented in her primary class as follows:

Students were given a task to write directions to get to their house. The students found it challenging as they hadn't thought about it. The teacher said to me this was a lead-in activity. So the lesson will need more theory or scaffolding before continuing.

This preservice teacher observed the teacher reflecting-in-action and listened to her mentor's future planning to advance the students' learning. Indeed, other preservice teachers also noted how their mentors scaffolded the learning of new concepts, particularly with the learning needs of students, for instance: “The main thing I learnt was that lessons need to be scaffolded more than I had done, especially when teaching a new concept. I also learnt that things can take a lot longer than I thought” and she suggested that “with more scaffolding students might gain more knowledge”. Managing classroom learning environment such as devising relevant hands-on activities for students was considered a teaching strategy by eight preservice teachers, highlighting mixed-group work as a productive output. Another six wrote about flexible learning environments with rotational activities in a range of locations (e.g., within the classroom, use of hallways and outdoor spaces).

An overriding theme through the preservice teachers' written observations of their mentor teachers was the need to develop teaching strategies that focus on the varying contexts for learning. It was noted that their teachers had to adjust teaching strategies to suit particular situations and students' varying contextual needs. In addition, flexibility in providing different learning environments for student contexts was recognised as a teaching strategy by four preservice teachers, for example: “Generally, work is done on the carpet; maths, generally in a circle” and that the “teacher's pedagogy and approach to the class continually

changes to cater for the needs of the majority of the class”. However, managing the different learning environments can present as a challenge to preservice teachers when attempting to implement practices themselves. To illustrate: “I believe that the children were engaged and enjoyed the multiple stations, however I overlooked the simple part of how to get them from one station to the next. I need to re-think how to do this”. Flexibility of teaching strategies was indicated for students who completed tasks early and those entering the class late for varying reasons: “When students drift into the classroom, three numbers of the day are already written on the board for students to start their maths activity; this activity supports the maths lesson and is used as a revision tool”. Catering for divergent contexts, including daily interruptions to the classroom program and the varied completion rate of learners required flexibility, which needed to be evident in the planning. Some preservice teachers noted that their mentors’ flexibility allowed the main lesson to continue with students entering class late allocated an alternate activity; however there was no evidence to determine if these alternate activities catered for the diversity of student learning needs.

Mentor teachers’ preparation of resources were observed by these preservice teachers as a way to address students’ diverse learning needs. The mentors’ use of aids that supported teaching and learning was presented by many of these preservice teachers. Two preservice teachers observed that auditory aids such as songs, rhymes and mnemonics were used to “remember word sounds and spelling” while four preservice teachers emphasised visual aids such as charts and books for stimulating learning around the topic. Another two preservice teachers pointed out the use of graphic organisers as visual aids. In addition, two more preservice teachers recorded that visual aids can include computers; despite one claiming, “we tended to waste a lot of time explaining what to do over and over again” and the other suggested the computer was used only to type up paragraphs written previously in the lesson. This indicated that timing direct instruction before a student activity needed to be monitored carefully along with advancing learning during the activity, ensuring it is not arduous, repetitious, or irrelevant but rather engages at the ZPD (Vygotsky, 1978).

There were observations and comments about student-centred and teacher-centred strategies. One preservice teachers was a mature-aged mother (>40 years old) who wrote that she was “very nervous about making comments this week” as she observed the classroom environment had “a strict routine and virtual absence of student centred learning”. She reported that her teacher mainly used teacher-centred approaches with “the whiteboard and

activity books/sheets”. Using this approach and the type of aids employed for students’ learning did not present favourably, as the mature-aged student could “see the disengagement by the students as learning, apart from the reward activities, is not enjoyable and as such may not be absorbing the content”. She likened the classroom environment to when she attended school with no technology apart from an overhead projector and “no room to group students’ desks to facilitate learning”. Indeed, she outlined that the limited space in the classroom did not allow for too much movement and the limited school resources presented little opportunity to facilitate more fluent student-centred approaches. However, she wrote that in this classroom “routine overrides planning and preparation as the curriculum is based on prepared worksheets”. This indicated that the preservice teachers were thinking critically about the strategies their teachers used for student learning. Figure 1 outlines the teaching strategies used by mentors (as observed by mentees) for differentiating student learning.

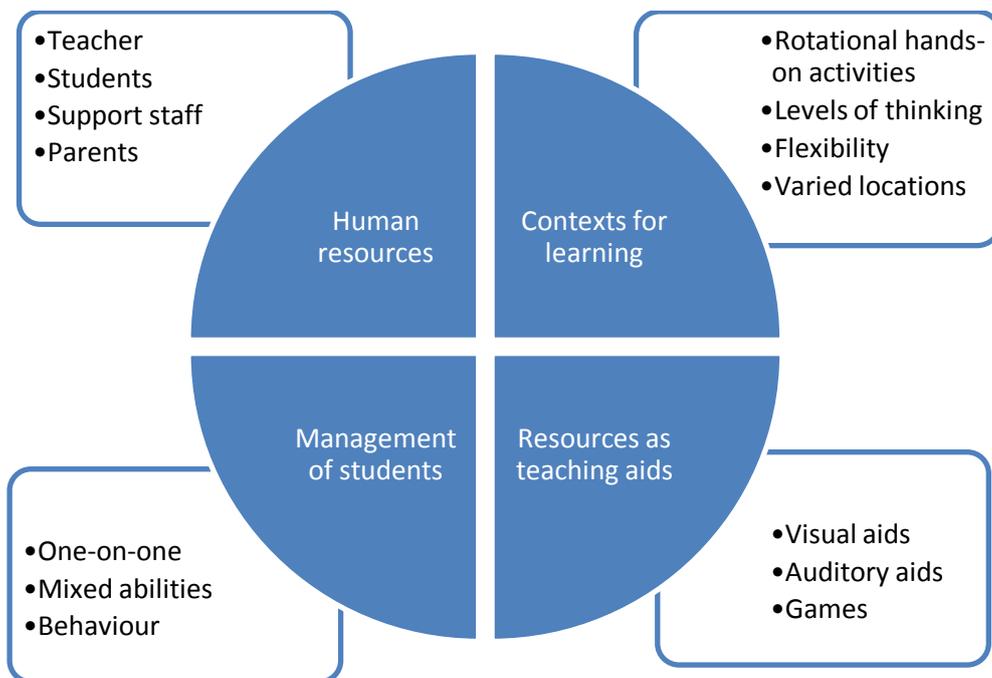


Figure 1. Mentors’ teaching strategies observed by preservice teachers

In summary, second-year preservice teachers’ observations for differentiated learning involved their mentor teachers using a range of teaching strategies (see Figure 1). Organising and deploying human resources to scaffold students’ learning included the teacher (instruction, observation and intervention), students as expert helpers, and other support staff (e.g. co-teaching, teacher aide). Managing students in groups, pairs and one-on-one arrangements presented as teaching strategies where the teacher or other facilitators could

scaffold students' learning. There were various contexts for differentiating the learning such as rotational hands-on activities, varied learning locations, flexibility of strategies to cater for late comers and early finishers, and use of levels of thinking and questioning techniques. Finally, visual aids (graphic organisers, computers), auditory aids (songs, rhymes, mnemonics), and games were considered as strategic tools for targeting students' different learning needs.

### **Conclusion**

This research investigated preservice teachers' observations of their mentor teachers' teaching strategies. Their observations of mentor teachers in this study, indicated that preservice teachers in their first practicum can focus on contexts for learning, organising human resources, classroom management scenarios, and the use of varied teaching aids and resources as part of differentiating student learning. It also showed that preservice teachers' observations of their mentors can commence at early stages for identifying teaching strategies and how they work for differentiation.

Further research is needed to understand the differences in how preservice teachers observe their mentor teachers' practices. It is assumed that deeper analysis of teaching will occur as preservice teachers progress through their practicum experiences; however such differences need to be mapped as an informative tool for targeting the differentiated needs of these learners. In addition, more qualitative research is required to understand how mentor teachers guide their preservice teachers on teaching strategies aligned with differentiated learning. Mentoring is a key part of understanding the practicalities of teaching and determining effective ways of mentoring preservice teachers in differentiated learning can assist preservice teacher development. Research around how these observations translate into preservice teachers' practices would be valuable to both mentors and university staff for guiding preservice teachers' practices.

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