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## Student Teaching as an Opportunity for Learning to Teach

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Latihan mengajar merupakan komponen penting dalam pendidikan guru dan antara tujuannya ialah untuk memberi peluang kepada guru-guru pelatih belajar untuk mengajar dan mempraktikkan teori-teori yang telah dipelajari dalam keadaan sebenar bilik darjah serta mengenali dengan lebih dekat lagi alam perguruan. Artikel ini membentangkan dapatan-dapatan dari kajian yang telah dijalankan di \_\_ \_\_ untuk memahami dan meneliti bagaimana guru-guru pelatih belajar untuk mengajar semasa latihan mengajar dan sejauh mana mereka berpeluang untuk menggunakan pengetahuan yang telah dipelajari. Beberapa faktor yang mempengaruhi pengajaran mereka juga dikenalpasti dan dibincangkan.

### Introduction

Teaching means helping people learn worthwhile things. It is a moral activity that requires knowledge of subject matter, persons and pedagogy. It demands principled and strategic thinking about ends, means, and their consequences. More important, it requires interactive skills and serious commitment to foster learning.

While the "apprenticeship of observation" (Lortie, 1975) gives a close-up, extended view of what teachers do, teacher preparation is the first formal encounter with professional modes of thought and action. Student teaching (teaching practice) is a part of the preservice education programme in which a prospective or would be teacher spends full time working in a school with a competent, voluntary, supervising teacher. It represents the culmination of the professional preparation programme for future teachers and widely regarded by teacher educators, prospective teachers and practising teachers alike as a valuable component of any teacher education programme. It is considered vital because this is the time when the student is enabled to make practical use over an extended period of time, of principles, methods, knowledge, and materials which have been learnt or acquired through the education theory courses.

The importance of student teaching is voiced often by teacher educators, in-service teachers, and many others (Griffin, 1982). Field experience and, particularly, student-teaching experience generally are perceived by education students to be the most (often the *only* valuable) component of their professional training and teachers regard



practice teaching as the most valuable part of their preparation (Lortie, 1975). It is held to be through practice that one really learns to teach.

Despite the importance of student teaching, there seems to be a lack of agreement about the value of field-based experiences in preservice teacher education and the role student teaching experience plays in the professional development of teachers. While student teaching is universally praised as the most valuable element of any programme of teacher education, very little is known about just what happens to students during this critical period (Zeichner, 1980). Relatively few researchers have actually examined what takes place during the experience itself and how professional life is interpreted and acted upon as students participate in its ongoing affairs.

Most studies on student teaching have been approached from an *a priori* reduction imposed by the researcher and rely exclusively on the pre-and post-administration of questionnaires and surveys for data and not upon observation of and discussions with students as the experience evolves, thus failing to address many important questions related to the experience (Zeichner, 1984). The limited view of the impact of the experience on the professional development of student teachers (teacher trainees) is also due to the fact that most studies of student teaching have been limited to investigations of student teacher ideologies or beliefs and expressed attitudes independent of any particular context.

Gaskell (1975) argued that investigations of only a particular set of predetermined "outcomes" in studies of field experiences ignore the numerous unintended outcomes and "side effects" that are inevitably associated with such experiences and would do little to further our understanding of the influence of field experiences on teacher education students. Consequently, to assume that one can gain an understanding of the role of field experiences in teacher development without observing or in some way documenting the experience is a fallacy. Without direct observation of field experience or some other attempt to document the experience, it also becomes difficult to understand the nature and quality of the ecological elements of an experience and to discover the developmental "outcomes."

The necessity for educational research to attend to the ecological characteristics of the learning process had been frequently reiterated by those who are concerned with the process of teacher development. McIntyre (1984) and Haberman (1982), among others, have called out for the need for more in-depth studies of student teaching experiences, "that are more naturalistic and less statistical focus," as a basis for understanding the effects on student teachers. As Feiman-Nemser and Buchman (1986) pointed out:

Without systematic description of what is taught and learned in the formal preparation and field experiences, we cannot understand what professional education contribute teachers' learning or the ways that learning can best be fostered (p. 1).

## **Purpose of the Study**

The principal purpose of this study was to describe and analyse the student teaching (teaching practice) experience as perceived by the student teachers (teacher trainees), i.e., to determine what kind of opportunity for learning student teaching offered to student



teachers and the impact of the experience on the student teachers' professional development.

## **Description of Student Teaching**

Each student in the Science Education Department who seeks a professional teaching degree or professional teacher certification must apply for admission to Teacher Education. The requirements for admission included meeting a predetermined grade point average and completion of the first methods course, Foundations for Science Teaching. Student teaching, which is a part of the Teacher Education programme, represents the culmination of the professional preparation programme for future teachers prerequisites for student teaching included admission to Teacher Education and completion of two other courses: Science Curriculum for Secondary Schools and Methods for Teaching Science in the Secondary Schools.

Student teaching is done in a carefully selected school under the immediate supervision of a selected supervising or cooperating teacher and the general supervision of a university lecturer or supervisor, who is a specialist in the student's teaching field. Among the goals of student teaching were to provide the student teachers with opportunities to develop a coherent, rational point of view concerning the relationship of the school to the community, educational principles as they relate to teaching behavior, and the learning situation; and teaching skills with respect to teaching plans, materials, classroom procedures and interpersonal skills.

Through the guidance of the supervising teacher, student teaching is articulated with instruction in general and specific methods and subject matter content through observations, conferences, and part-time teaching, leading to full-time independent teaching by the student teacher, in which the student teacher handles all the duties of a teacher. The full-time independent teaching was for a minimum of ten consecutive days or two weeks out of the total ten-week student teaching period. They began the student teaching by observing the cooperating teacher, checking papers, helping individual pupils, and learning the general classroom procedures.

In addition to being in school during the stipulated ten weeks, student teachers were also required to satisfactorily complete several other assignments. These included videotapes of their teaching plus analyses, incorporating demonstrations of two of the following methods: large or small group discussion, laboratory or other "hands-on" activity which is not "cookbook" activity and/or brainstorming activity; daily journals of experiences at the school; and design, implementation and evaluation of an investigative project. Seminars, conducted by the university supervisors, were held five times during the student teaching period and attendance was compulsory. The sessions were used to discuss problems related to assignments and other general concerns. It was also a day to hand in assignments.

## **Methodology**

A qualitative design, was chosen for the study because it allowed for detailed and flexible descriptions of classroom settings, contexts and behavior (Bogden & Biklen, 1982). The



design was considered appropriate since the intention was to describe, analyse and explain the student teaching experiences.

The two main techniques employed in this study were observations and interviews. During student teaching (teaching practice) the student teachers were observed at least once weekly in the classrooms. Field notes were written during the observations and recorded in a chronological order. Informal interviews were conducted after each observations or whenever additional or clarifying information was needed. Formal interviews were conducted prior to and at the end of student teaching. These interviews were structured, being designed to get information of particular points for systematic analysis. All interviews were tape recorded to give verbatim transcriptions of what transpired.

Other sources of data included the journal of reflections of the student teaching experience, written assignments and lesson plans. The cooperating/supervising teachers and university supervisors were also interviewed to examine the sources of influence to the professional development and growth of student teachers.

Data analysis followed the procedures described by Glaser and Strauss (1967). Transcripts were examined and recurring themes were identified for content analysis. A description of each student teacher's experiences were then written based on assertions developed from the major themes.

## **Participants (Subjects)**

The participants or subjects for the study consisted of four student teachers (teacher trainees) from a group of students enrolled in a secondary science education programme in the Department of Science Education. The four participants, Susan, Christie, David and Andy, differed in age, experience, background, and content area expertise.

Susan, in her early thirties, had received her undergraduate degree in biology eleven years prior to the beginning of this study. She had worked as a laboratory technician, then as a consultant, "training people to use equipment." Susan had limited teaching experience through tutoring children while a student in high school and had worked for a year in an elementary school.

Andy was in his early twenties with a background in Forestry. After working for two years in forestry, he decided to study for his teacher certification. Initially interested in teaching biology, Andy decided to specialize in geology-earth science after taking several courses in geology at the university.

Christie was in her early twenties and was a senior at the university, majoring in chemistry. She had no previous work experience. She decided on teaching after considering several other career options. She saw teaching as an opportunity to expand her knowledge while allowing her to be creative and flexible in helping people particularly pupils.

David was in his mid-thirties with a background in soil science and plant pathology. His work experiences included three years in the Army, several part-time jobs, and volunteer work at the Nature Center. His work at the Nature Center led to his decision to be a teacher although he had reservations about classroom teaching "because I am not used to



being with a group of people, especially a group that feels that they are forced to go to school when they'd much rather hang around with friends."

Placements for student teaching were based primarily upon the principle of putting the students in a student teaching situation that would provide for optimal professional growth. The assignment was made cooperatively with the school system, the programme student teaching coordinator and the Office of Professional Laboratory Experiences, which also coordinated the actual placements and responsible for arranging a visit to the school prior to the beginning of student teaching.

Susan and Andy were both assigned to the same rural county high school which served two adjacent counties. Eighty-five percent of the student population was black and came from a low-socio economic community. According to one of the cooperating teachers, most of the pupils came from one-parent families, were not academically oriented and "only a handful, if any, would make it to college/university." Susan taught biology while Andy taught earth science.

Christie requested and was assigned to teach chemistry and mathematics in a rural county high school. She believed that she could be more useful in the rural setting. The racial mix of the school was sixty-six percent white and thirty-four percent black.

David was assigned to a suburban high school where he taught fundamental and advanced biology classes. However, most of the observations for this study were done in his fundamental classes where all the pupils were black.

## Findings and Discussion

The principal purpose of this study was to describe and explain the student teaching experiences from the perspective of the student teachers. Descriptions of each student teacher's experiences during student teaching will be given followed by a discussion on the process of learning to teach and influences on teaching.

### Student Teaching Experiences

As the participants anticipated going into schools, they saw the experience as an opportunity for learning about themselves as well as learning about teaching practices. The students expected the experience to give them practice, they expected to be active in the classroom. They wanted to acquire practical and specific ideas for successful performance. Some of the students' comments were:

.....a chance to try and figure out....your best methods, means of teaching...

.....to practice and develop skills....wait-time, questioning techniques  
...each time you do it, you learn to master it....the more you do ,the less apt you are not to handle the situation correctly.

.....actually det to work with the pupils but given guidance as to what you can do to improve your teaching requirements rather than just do a hit or miss thing. You get feedback on what you do from somebody who is in the position to correct mistakes.



They were apprehensive and concerned about their ability to perform and function in the role of a teacher and they were worried about classroom management. At the same time they were eager and enthusiastic to be in the classrooms, confident somehow that they would be able to do well, as evident in this participant's comments:

I am working very hard to reverse the preceived ideas (about high school pupils), to go in very positive and self-confident and to watch ahead for problems.

The participants' stories however, speak of the difficulties of the learning process when a novice steps into a stranger's classroom and the "takes over" for a specified period of time. As student teachers, they taught in classrooms where instructional and management routines were already established and to a certain extent their choices about classroom activities were guided and controlled by rules and regulations imposed by a number of persons.

### Susan

Susan had a cooperating teacher who believed that the best way to learn how to teach is by doing and assuming full responsibility for the class. His belief was based in part on his own student teaching experience where he was totally responsible for his class. He wanted Susan to have the same responsibility and freedom, "just as long as her ideas and activities were in line with the subject matter." He was always supportive of her and assisted as well as encouraged her. He frequently asked if there was anything he could do, materials she might need, to help make her teaching more interesting and effective.

Their relationship was initially hierarchical in nature which later moved towards equality. They both have respect for each other as professionals and looked at each other as teachers and partners responsible for teaching the class. She enjoyed observing the cooperating teacher when he was teaching and thought that they shared similar views on teaching, each having the pupils' interests in mind when planning lessons. She observed that the cooperating teacher "went to a lot of trouble to make things different for the kids so that they won't get tired or bored." Their relationship later became more informal, warm and friendly.

We just had a great relationship. I consider her (Susan) as a good friend now. We have become now a lot more at ease with one another. I think that's part of the reason we have had a good relationship.

Pupils responded positively to her presence in the class and acknowledged her as the authoritative, not authoritarian, figure in class. She had established this legitimate authority very early and was therefore able to commence with a meaningful classroom instruction. She had mentioned that the pupils responses to her were in part influenced by the cooperating teacher's treatment of her in his class.

Susan was successful in introducing different approaches to pupils who were more used to seatwork or written work. She used a lot of small group cooperative learning and showed her own enthusiasm and interest in the subject. Her teaching was more from showing and doing rather than telling or forcing the pupils.

Susan's planning and teaching were influenced by her perception of the pupils' conception of science and her beliefs on what pupils should know. She believed that at this stage, with



this class and group of pupils, the most important thing was to expose the pupils to the basic facts and information and to emphasize understanding rather than memorizing. To facilitate understanding and to make learning "alive and fun," Susan included a number of activities. She would relate the contents to everyday experiences or use analogies whenever possible.

Susan reported making some errors in judgement and decisions on the amount of content to be delivered. She recalled an incident when the pupils were overwhelmed with the amount of information she had given them. They were also confused because the information fluctuated between being too vague and too detailed. At that time, she did not feel that it was entirely her fault. She learned then to scale down her expectations and to reduce the content to match the pupils' ability level. She reasoned that she "did not know how much is enough," but was confident that she could learn through experience.

Susan felt that the student teaching experience was important because it gave her more of an appreciation and awareness of what teaching entails and the responsibilities that come with it. It also provided her with the opportunity to examine her feelings and attitudes toward teaching and assess her capabilities as a teacher.

I think I could be a very diverse teacher now. That's the main thing that I got out of student teaching, just having that confidence to try out new things ... I would be a good teacher and I could offer a lot ... make a big difference in a lot of kids' lives.

As a latecomer to the teaching profession, Susan possessed the maturity acquired through her experience. She showed responsibility in her judgements and actions. She was able to handle the responsibility that was given to her and her confidence in turn gave the cooperating teacher the assurance and confidence to turn the class completely over to her.

## Andy

Andy's cooperating teacher had no prior experience in supervising student teachers. However, she believed and expected that prior to coming to school, the student teacher would have some knowledge and skills characteristic of effective teachers. She relied on her own teaching experience to guide her approach with Andy.

In view of her expectations, she initially treated Andy as a peer, giving him the liberty to try out new ideas, activities and methods in her class. They would discuss his plans before class and discuss the performance after the actual teaching. She would suggest changes then. However, this approach changed when Andy repeatedly "failed" to implement his plans and maintain order in class. The approach later was to discuss the plans and the necessary changes before Andy actually taught the class. Their relationship changed from being equals to superordinate-subordinate, with Andy as a student trying to learn and acquire the teaching skills under the guidance of his cooperating teacher.

The change in approach was due mainly to Andy's inability to maintain order in the class and keep the teaching organized. According to the cooperating teacher, Andy was an unorganized person who did not know what he was doing and "they (the pupils) very much got that image." They did not have much respect for him as a teacher, "and that's one of the hardest things you can give out to the pupils."



Andy was also getting negative responses from the pupils for his teaching approach, which was different from the cooperating teacher's. He did not want to continue the seatwork approach practised by the cooperating teacher. He did not like the structured atmosphere and had intended to establish a more relaxed learning condition, working on hands-on activities. He attempted to introduce new approaches and ideas that he felt could motivate and arouse interests in pupils.

His early teaching styles, consistent with his beliefs, were characterized by hands-on activities either in groups or individually. He used his creativity to come up with activities that would allow pupils to be actively involved in learning. He spent a lot of time and effort planning and preparing learning materials for the class and was quite concerned with the amount of time involved.

However, Andy encountered a lot of resistance as he tried to implement the teaching strategies. He was unable to create a place for his teaching strategies in the classroom with that group of pupils. After several attempts, Andy and the cooperating teacher mutually agreed that he should go back to the "old" ways of teaching the pupils.

It's just causing too much problems with those kids ... They won't cooperate ... the class is going to be more structured because that's the way they want it ... they are going to see more things coming back the way they are used to ... I have tried ... there's only so much you can do and after that, it's no longer a burden on your shoulders.

Since he was teaching in someone else's class and with the pupils' best interest in mind, Andy decided to conform to the situational requirements. However, he retained private reservations about doing so.

Andy's action was a form of impression management (Ross, 1988); a process of engaging in activities to please one's superior, even when that activity is not part of the individual's belief system. He harbored reservations about things that he had done in the class and declared that he would not have taken those actions without the influence of situational constraints.

My teaching strategies, the ones I employed as student teacher, a lot of them I wouldn't employ in my own class room. I was in somebody else's class, doing the things the way they want it done and that's the way I do that. It created so many problems that we kind of mutually agree to go back to the way she did things because it was just a real rebellion to change what they were used to.

Andy encountered other difficulties as well. One was gaining territory, i.e., a teacher must establish the fact that he is in control and must be so perceived by the pupils. Andy was not able to do that. He had to compete for pupils' attention with the cooperating teacher who was reluctant to hand the class completely over to him. She was always there and pupils found it easier to consult her rather than Andy, even while he was teaching them.

He also had difficulty in determining the social relationship between pupil and teacher. Andy had tried to treat his pupils as equals but found that it was not conducive to establishing an atmosphere for meaningful learning. He became more assertive and authoritarian, as suggested by his cooperating teacher, who strongly believed in maintaining order and control at all times.



As I told him (Andy), you always got to maintain control. No matter what's going on, you have got to maintain your cool and control, so that you are always in charge.

Andy also found it difficult to teach for understanding. It was easier for him to teach and plan activities for topics that he was comfortable and more familiar with. Otherwise, he was teaching out of the textbook.

It's hard for me to come up with interesting analogies or stories. I don't have the depth to explain these things well ... to come up with correct simplifications. When you don't know things as well as you should, you could make simplifications that are not correct.

Despite the difficulties in teaching and dealing with pupils, Andy thought that he had a good student teaching experience and learned a lot from it, especially the practical things, "discipline, the way kids act, how much time you consume and how to say things out." He also felt that the additional assignments and "paper work" required during student teaching took away the time from him and hindered him from doing a good job as a teacher.

## Christie

Christie had a cooperating teacher who had experience working with student teachers. He believed that professional education courses were not adequate for learning to teach and had an image of student teachers as "defective," lacking in the skills to teach. However, since he also believed that one can only learn to teach by teaching, he was willing to let Christie try her ideas in his classes provided that she "fit" into the curriculum that he had laid out.

I (cooperating teacher) am not going to change a thing. It will be my way and that's the way it's going to be ... not willing to give the student teachers 100% freedom ... I don't let the student teacher get into trouble and I don't let the kids suffer because of the student teacher.

Christie explained that she had limited freedom to plan and use her own materials. The cooperating teacher simply told her what to do, what materials to cover and when to do it. He made most of the decisions and she just went along with whatever he had planned for the pupils. Partly due to time constraints, she chose not to add any new activities of her own.

If I did want to bring in another lab or demonstrations in there, I am sure he would let me. I just choose not to because I don't want to get way over my head.

Christie did not like the cooperating teacher's styles and approach to teaching. However, observations of her teaching throughout the Teaching Practice did not show any significant change or deviation from the "traditional manner of lectures, cookbook labs and worksheets" that was used by the cooperating teacher.

Christie stated that she learned to teach by doing, improving her lessons as she taught from one class to another. She learned from the first lesson what to keep and what to leave out for the next class, "fixed whatever was wrong and go on from there." She cited several



occasions when she had to change her plans to accommodate for the changes that she had to make because "it didn't work the first time around, the students were confused and the teaching didn't go smoothly as planned."

Christie was satisfied with her performance, and since she did not introduce any significant changes to the existing structure, did not face any resistance from the pupils. She was able to establish her status as a teacher with authority over what went on in class and did not hesitate to take appropriate actions to ensure proper classroom management.

Despite her strong-willed personality and definite feelings of self-confidence in her teaching and knowledge of subject matter, Christie was clearly not willing to go against the requirements set by her cooperating teacher. She was also observed to exercise impression management.

I just resigned myself to it ... I just make a note that I won't do that in my own classroom. I just did it. I can't change him. If that's the way he wants it done, then it's okay.

She reasoned that compliance with the cooperating teacher's requirements would be to her advantage and could reduce stress in an already stressful situation. Besides, she needed the time to work on her assignments and other student teaching requirements.

Christie mentioned time and again that she enjoyed her student teaching experience. Still, she thought that the student teaching did not match her expectations in some ways and she did not feel that she learned anything about how to teach.

The experience taught her that she still had a lot to learn but at least now she had a practical base to draw from, not the "textbook ideals of the right way to teach, manage a class and handle discipline problems." It also provided her with the opportunity to assess her performance and commitment to teaching.

I got more confidence in myself, about my ability ... I know I can do it.....I don't think that I am a master teacher but I don't think that there's anything I need to know that I can't find.

## David

David had an experienced cooperating teacher who was interested in learning and improving herself professionally. She expected to learn from the student teacher as well as help the student teacher to learn about teaching. She believed she had a lot to offer from her own experiences and knowledge as a teacher.

The cooperating teacher was initially helpful, giving David "a lot of input but not many constraints" about what he could do. She offered him a number of suggestions and materials which David took advantage of in order to save time for himself. He also reported that he did not do everything she said or suggested because he did not agree with some of her teaching practices and did not think that she was a good teacher.

However, after the first couple of weeks, there was virtually no interaction or communication between David and his cooperating teacher. According to the cooperating teacher, David did not ask for much guidance, did not confide in her, and did not even bother to share his



lesson plans with her. David did not ask for much because he felt that "there's really not a whole lot that she could do to help me." There was also the time element. Both were just too busy with their own work to make time to communicate or interact.

She's busy doing things herself ... she's always busy grading papers and things like that and I have only got, since teaching full time, five minutes between classes .....

There was also no noticeable interaction between David and his pupils, who were all black. According to his cooperating teacher, he was "curt and almost to the point of being abusive with them in his voice inflection" when dealing with that group of students. He had low expectations for his pupils and also had a negative image of them. He believed that the pupils were forced by the system to be in school when they were not really interested to be there. As such, he did not feel that it was his responsibility to make them learn if they did not feel like it.

I'm not going to carry everybody or put a gun to their heads ... I would wear myself out if I had to do that all the time .... just don't see any point in forcing people to do things .... it's their responsibility .... I don't feel guilty about it ....

David did not introduce any innovative ideas in his teaching strategies. His teaching approaches were adjusted to what he perceived were most important and needed by his pupils.

.... lots of written stuff ... everybody I talked to said the pupils need more structured kind of thing. You can't expect them to do discovery thing unless you tell them what to look for ... step by step thing .. concrete examples ... a lot more practical needs than sticking mainly to the biological or botanical things because that's what they were more interested in - something that affects their lifestyles .....

He relied heavily on textbooks for ideas for worksheets and activities. He made no attempts to modify any of the ideas or materials that he got out of the textbook or that were suggested to him by the cooperating teacher. Explanations given to pupils depended very much on his content knowledge, "...more things that I have prior knowledge about I'll talk more."

David enjoyed teaching laboratory activities, but due to the time involved to prepare for them, he opted for more written work like worksheets and crossword puzzles. He believed that these activities were good enough to get the knowledge across to the pupils. He admitted that he did not do a good job teaching them but at that time he was also concerned about the assignments that needed to be completed. His other concern was time:

I didn't have enough time to go running down the materials ... there was a lot more things that I could have done too but just didn't have enough time to plan for them ... I just had so many other things to do that I couldn't budget my time that far in advance ... just prepare as much as you can and then you have to go with what you have got.



David was tense and worried throughout the student teaching period, and was naturally glad when it was over. The experience gave him a taste of the realities of teaching and made him realize that "it's more of a challenge than I am really prepared to get into." However, he was still interested in teaching and sharing his knowledge, but not in a situation where people are forced to listen to someone.

David resented the amount of work he had to do in school especially writing tests and grading papers. He did not feel his responsibility should include "all the extra paper work." He also complained about the assignments and amount of time he had to devote to completing them.

I was really burnt out from staying up late, getting the things together and I really didn't have much to give at that point.

David had two major concerns throughout student teaching. One, as mentioned earlier was time. The other was survival.

.... my main goal was to just to get through ..... if I am able to function for all those days in class, I think I would have done just fine .. it's really an artificial thing anyway ... you are expected to do a certain performance. That's what I am doing.

As a latecomer to the teaching profession, David failed to exhibit maturity in his actions or behaviour or approached problems in a manner that showed understanding of human behaviour and human nature. He was not aware that he was a problem to both the cooperating teacher and university supervisor.

## Learn to Teach

As illustrated above, each student teacher experienced his/her student teaching differently. It depended on the relationships that were established with the cooperating teachers and pupils and opportunities for explorations and experimentations with ideas in attempting to learn to teach. It also depended on how the students made use of the opportunities available to them.

Only Susan was considered to have a successful student teaching experience. She was able to establish a good working relationship with the cooperating teacher and pupils. She had ample opportunities to try out new ideas, to put her knowledge into use and to improve on her teaching techniques and skills with the support of her cooperating teacher. Student teaching provided her with a good opportunity for learning to teach in a supportive and safe environment.

The other three participants, however, had a limited opportunity to learn how to teach. They were limited in their opportunity to explore and experiment with ideas and to work on their teaching skills. They were also limited in the opportunity to develop their own perspectives about teaching. Andy and Christie were observed to act in the manner that were required of them by the cooperating teachers and simply took ideas that were imposed on them. David, being older, was able to operate independent of the cooperating teacher, and "not do everything that she says." However, this caused a strain in their relationship.



Despite the tensions and frustrations, and the less than satisfactory student teaching experience, all four student teachers agreed that student teaching was the most important part of the programme because it was through experience and practice, however limited the opportunities might be that they learned to put their knowledge into use. Each student's appraisal of his/her performance as it reflects his/her experience in schools, is a product of learning. A student's awareness of his/her interests, relative strengths and weakness, satisfactions and dissatisfactions were among the products of learning.

It has been a difficult ten weeks, a struggle to say the least. Knowing that I stuck it out because I wanted to, not because I had to, makes me feel good about myself and what I can do. I've found out a lot about myself in the past ten weeks.

... it's hard, it's a lot of work. I know I like working with kids and that is still (kind of) dominant.

The student teaching experience brought them new personal and professional insights. It was an opportunity to assess their capabilities, interests, and motivation in the profession. It was a chance to see and experience the real situation, the uncertainties and complexities classroom life. They learned basically through trial and error, improving their techniques and approaches as they moved from one period to the next. They learned through role-playing, which included duties assumed in the classroom that were considered to be "teacher activities."

After the student teacher had taught for some time, there was a change in his/her focus of attention. The focus changed from his/her own acts and/or planning towards pupils act and/or thinking. There was also a change in the amount of information of knowledge, from trying to transmit large quantities of facts towards a reduction of quantity. The amount of information was adapted to what was apparently possible for pupils to achieve in terms of quantity. They learned through trial and error to determine the quantity of knowledge to be transmitted to pupils.

However, in teacher education, experience is not always a reliable or systematic teacher (Feiman-Nemser & Buchmann, 1985). Although unsystematic, it does have the advantage of focusing immediate attention on problems to be solved. Attending to the immediate requirements for action in established settings, however, does not foster the capacity to learn from further experience. By working on trial and error, teachers were often unaware of how they organize and conduct academic tasks for pupils. Learning from further experience presupposes acting from understanding. If significant change is to occur, requires a quality of experience that supports personal exploration, experimentation and reflection.

## **Influences on Teaching**

While the professional education courses might help shape their view and conceptions of science and science teaching, reality constraints forced some of the student teachers to exhibit behaviours that were contrary to what they learned. Cooperating teachers, pupils, and time were mentioned as having an influence on teaching. Other factors included their beliefs and mastery of content knowledge. The effects were observed either at the planning stage or exhibited behaviours in the classroom.



## **Cooperating teachers**

Student teachers were influenced by suggestions received from the cooperating teachers and other teachers in the school. Suggestions ranged from teaching techniques and organization of content to specific classroom management. However, student teachers still had a choice whether to follow or disregard the suggestions. Most tended to follow or accommodate the suggestions given by the cooperating teachers because they were teaching in his/her classrooms and because they felt that the cooperating teachers would know what worked best in their classrooms with that group of pupils.

## **Beliefs**

The student teachers' beliefs and perceptions about pupil characteristics influenced their judgement about pupil abilities. Based on these judgements, student teachers developed a set of expectations which guided the curriculum they offered and the instructional strategies they used. Their choice of teaching strategies and activities varied according to the perceived abilities, attitudes and behaviours of the group of pupils taught.

## **Pupils**

While the student teachers' beliefs and perceptions about pupils and curriculum influenced their planning and instructional strategies, the actual implementation of the strategies were influenced by pupils' reaction and responses to the approach. Student teachers indicated that they still looked at pupils' response as an indicator of their performance. A positive response from pupils indicated acceptance and would reinforce the use of such a behaviour and thus influence their planning for future teaching. A negative response indicated a need for change in their approach and methods of teaching.

## **Content knowledge**

Another source of influence was command or mastery of content knowledge. Student teachers reported feelings of inadequacies and uncertainties due to the lack of subject matter knowledge which influenced their planning and the type of instructional activities chosen for teaching content. The instructional emphasis tended to be learning science facts, completing exercises and answering questions in the book rather than learning for understanding. They were more creative in their planning and use of instructional materials when they had a good grasp of content knowledge.

## **Time**

Time was one element that was frequently mentioned by the student teachers, cooperating teachers and university supervisors. Time was looked upon as a constraint on the effective performance of their roles and responsibilities.

Student teachers talked about time as it related to their roles and responsibilities as students at the university and as student teachers. They talked about the amount of time they had to spend on planning and preparing materials for their teaching. Each student responded differently to the time constraint depending on how effectively they could organize their work and manage their time.



Susan, for instance, was well organized and managed her time effectively. She was therefore able to implement her plans smoothly and to include hands-on activities in her teaching strategies. Andy wanted to have lots of activities in his teaching but had problem in organizing and managing his time. Consequently, he had problems with his preparations and implementation of plans. However, he persisted and tried, putting his creativity to work, coming up with fun activities for the pupils. Creativity is important in teacher education. However, creativity alone is not enough. Also important is the ability of the individual to carry out that particular strategy. Christie decided not to put an additional burden on her time, so she chose to do the minimum that was required of her. David thought that he done an adequate preparation for his teaching and since his time was limited, was not able or willing to come up with materials of his own. He considered the commercially prepared curriculum materials to be sufficient for his purposes.

Student teachers also mentioned the amount of time they had to spend on their student teaching assignments. Some believed that these extra "paper work" took away precious time that could be spent on preparing their lessons. In order to make up for the shortage of time, some chose to spend their "free" time in school to work on the assignments, thus neglecting some of their responsibilities in the preparation for teaching. As one cooperating teacher explained,

they spend all their time writing .. I know they have to do them (assignments) ... but like the labs we are doing now, I still have to mix everything. She's (student teacher) worried about getting the assignments done .... doesn't have time to worry about mixing solutions.

Another issue is related to the time of student teaching. The student teaching was done towards the end of the school academic year. Both the cooperating teachers and student teachers felt that the time was not conducive for student teaching. Routines had already been established and pupils were not willing to accept any "drastic" changes to their already set routines. Also related to student teaching is the length of time for full time teaching in the classroom. Both the cooperating teachers and student teachers thought that the time (ten days) was too short for them to learn about classroom practices and to improve on them. As one student teacher said, "we need to do more than two weeks of full time teaching."

Both the cooperating teachers and university supervisors mentioned time as affecting their performances in supervision, especially conferences. Interactions between some cooperating teachers and student teachers were also limited because of the limited time available to them. Due to other responsibilities, they were not able to spend that much time in conferences or gave extra attention to the student teachers, as was required.

... if I could spend more time with them I would probably ask them, "well, tell me what you would do differently about this?" but these kind of conferences wind up being several hours long and I guess at this point, unfortunately, I don't have the time to spend with them ... (university supervisor)

... busy ... lot of commitments and responsibilities ... did not spend enough time with the student teachers ... I wish I had more time to work with the student teachers to teach what they need to know .... (cooperating teacher)



Time is one of the most important resources required to support professional development. However, time was one element that was not readily available to the participants in the study. Growing takes time. Time is necessary for reflection, for absorption, for application and for playing with ideas, both individually and with colleagues.

One possible solution as suggested by one of the cooperating teachers is to reduce the number of preparations, including assignments, so as to make time available for reflections and interactions. The interaction opportunities would lead to further stimulation and growth in professional development. Prior to student teaching, time should be made available for student teachers to explore and plan for their learning experiences and to become familiar with the context where the student teaching experience would take place.

Another possible alternative is to utilize the time allocated for seminars for the purposes of discussing common problems observed by supervisors and experienced by student teachers. Student teachers mentioned that they did not find the seminar particularly useful because it did not allow for opportunities to share and talk about their experiences in schools. Discussions on problems and practices could help student teachers reflect on their experiences and the stimulating interchanges of minds could result in intellectual ideas for improvement of professional practices. As one student teacher observed, "it's more interesting and more helpful to hear about what other people are experiencing." It was a sentiment shared by the majority of the student teachers.

## Conclusion

The findings reinforced the perceived value of student teaching as the most important part of the students' preparation. However, opportunities for learning to teach depended on the cooperating teacher's attitude towards the student teachers, their beliefs about learning to teach, and their willingness to let the student teachers explore and experiment in their classes. Only one student teacher had the opportunity to fully utilize the student teaching period to learn how to teach with the support of the cooperating teacher. The other three student teachers were afforded varying degrees of freedom to explore and experiment and were therefore limited in terms of the activities they could do in the class with the pupils. In addition, they were often frustrated in their attempts since they did not get support from either the pupils or cooperating teachers. The student teachers still learn to teach by teaching and through trial and error, and that ecological classroom conditions act as constraints on their actions, and exert pressures to act in certain ways. Responses to the constraints not only depended on their personalities, but also on their motivation and other demands that were placed on them.

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