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Hong Kong Student Teachers' Personal Construction Of Teaching Efficacy[1]

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ABSTRACT *This study employed the repertory grid technique to investigate how a sample of 27 student teachers in Hong Kong developed a personal sense of teaching efficacy. The analysis indicated that the third year students' perceptions were more homogenous than were those of the first year students. The results also indicated that teaching efficacy was viewed in terms of the dimensions of concern for instructional participation and learning needs of pupils, communication and relationships with pupils, academic knowledge and teaching skills, lesson preparation, management of class discipline, teaching success, teaching commitment, and a sense of self-confidence. Experiences of teaching practice, electives, pupils, and teaching practice supervisors (Electives) were the major sources for the development of a sense of teaching efficacy. Implications of how those aspects of teacher training can be more effective in engendering a sense of efficacy in the student teachers are discussed.*

The assessment of student teachers' teaching competence can be made by means of external criteria involving classroom observations, performance tests, and evaluation by teaching practice supervisors and co-operative teachers (Brooks *et al.*, 1985; Dewalt & Ball, 1987; Salzman, 1989; Stolworthy, 1990; Vollmer & Creek, 1988; Wiersma *et al.*, 1983). Nonetheless, these measures on many occasions may be incompatible with the trainees' own idiosyncratic self-perceptions of their competencies, values and needs as a teacher. The success of teacher education relies to a large extent on whether a training curriculum can be realised in terms of student teachers' personal construction of educational thoughts and in their self-exploration and self-actualisation through practical teaching experiences (Costa & Garmston, 1987; Egar, 1974). After all, student teachers' beliefs and attitudes affect the way they learn to teach, and their perceptions, judgments, decision-making and actions in the classroom (Calderhead, 1991; Calderhead & Robson, 1991; Hollingsworth, 1989; Johnston, 1996; Richardson, 1996;

Wubbels, 1992). In this connection, teacher training effectiveness can be considered according to the development of student teachers' cognitive structure of teaching competence, a significant part of which is founded on a personal sense of teaching efficacy.

Studies in teacher efficacy have relied mainly on the use of questionnaires. In most cases, items are pre-designed for responses and they are summed to arrive at an aggregate score as a measurement of teacher efficacy. However, diversity in cultural, educational and training environment may result in differential perceptions of teaching efficacy. Under these circumstances, such teacher efficacy measures may not be adequate for reflecting different perceptions of teacher efficacy.

In planning this study, it was felt necessary to adopt a methodology that would enable the investigation of student teachers' personal views of teaching efficacy. The repertory grid technique, based on the theory of personal construct psychology of George A. Kelly (1955), seems to be appropriate for this purpose. Utilising the SOCIO computer program (RepGrid 2, 1993; Shaw, 1980, 1989), the cognitive constructions of student teachers' sense of teaching efficacy can be compared and the constructs that represent the commonest views of student teacher efficacy can also be identified. Furthermore, the technique has the advantage of preserving the original data for open analysis and examination. This study is an attempt to apply the repertory grid technique to study the impact of teacher education on student teachers' sense of teaching efficacy and to demonstrate that it has the potential to provide a basis for meaningful qualitative analysis of the sense of efficacy.

Student Teachers' Teaching Efficacy

Much recent research has been concerned with investigating teacher effectiveness in terms of teachers' sense of efficacy (e.g. Ashton, 1984; Deham & Michael, 1981; Rich *et al.*, 1996; Soodak & Podell, 1996, 1997). The majority of the research has been based on Bandura's (1977) theory of self-efficacy. According to this theory, self-efficacy is composed of two components: efficacy expectation and outcome expectation. This conceptualisation suggests that the confidence of performing an act is independent of expected outcomes being perceived. Gorrell (1990, p. 77) pointed out that research into self-efficacy has provided support for "the view of self-concept as a composition of specific beliefs about specific areas of one's life, as opposed to a global self-concept that changes with new experiences; it also supports the assumptions that changes in self-concept can be linked to changes in effort and achievement."

A direct measure of teacher efficacy, consisting of only two Likert scale items, was introduced by two Rand Corporation studies (Armor *et al.*, 1976; Berman *et al.*, 1977). This approach was the basis of several later conceptualisations of teachers' sense of efficacy (Ashton *et al.*, 1982; Deham & Michael, 1981; Dembo & Gibson, 1985). Following the publication of Bandura's (1977) theory of self-efficacy and building on the work of Ashton *et al.* (1982), Gibson and Dembo (1984) developed the Teacher Efficacy Scale. Their factor analysis results identified two factors: Personal Teaching Efficacy, which represents a teacher's belief that he or she possesses the skills and abilities to bring about student learning, and Teaching Efficacy, which appears to represent the belief that any teacher's ability to bring about change is restricted by factors external to the teacher, such as the home environment, family background and parental influences. A number of subsequent studies have supported this two-dimen-

sion structure of the Teacher Efficacy Scale (Anderson *et al.*, 1988; Enochs & Riggs, 1990; Riggs & Enochs, 1989; Woolfolk & Hoy, 1990; Woolfolk *et al.*, 1990).

However, there has been much controversy over the factor structure and construct validity of this latter scale. Woolfolk *et al.* (1990) argued that both the Rand items and the two dimensions of Gibson and Dembo (1984) only measured efficacy expectation, but not outcome expectation in Bandura's sense as they are concerned with performance capability. After revising the items of the Teacher Efficacy Scale based on a locus of control orientation, Guskey and Passaro (1994) found that the two factors as identified in the altered scale carried meanings somewhat different from the factorial interpretations made by the Gibson and Dembo's (1984) Study. The factors implied whether or not the beliefs of teachers themselves and teachers in general affected the learning of pupils. Woolfolk and Hoy (1990) suggested a three-factor model in which the personal efficacy factor of the Gibson and Dembo's (1984) Teacher Efficacy Scale could further be divided into a teachers' sense of responsibility for positive and negative student learning outcomes would be more appropriate.

In addition to supporting the cross-cultural validity of the Gibson and Dembo's (1984) scale as applied to a sample of Israeli teachers, Rich *et al.* (1996) demonstrated that an additional factor could be identified that assessed teacher efficacy for coping with student social relations. According to the study of Soodak and Podell (1996), a factor, subsequent to the inclusion of 18 items into the Gibson and Dembo's (1984) scale, could be interpreted as a dimension that specifically measured outcomes of effective teaching behaviour in terms of outcome expectations of Bandura's model of self-efficacy, besides the other two factors that would be considered as pertaining to Gibson and Dembo's (1984) scale.

Some studies have focused on observing the changes in novice trainee teachers' sense of teacher efficacy in the course of pedagogic development. Soodak and Podell (1997) showed that the pre-service teachers had a higher level of personal efficacy than did practising teachers in their initial years of teaching, even though the latter group's sense of efficacy increased as their teaching experience accumulated; and that the secondary teachers also had a higher level of personal efficacy than did the elementary teachers, whereas only the elementary teachers, on the contrary, demonstrated a slightly greater belief in teaching efficacy than did the secondary teachers. Housego (1992) found that the student teachers' feelings of preparedness to teach increased only in the first two terms and their personal teaching efficacy in the first term. There was a general decline in their feelings of teaching efficacy. In another study, Martin (1989) found that a high sense of teacher efficacy began early in student teacher preparatory programmes. The study of Evans and Tribble (1986) showed that there was a low, but significant, positive correlation between efficacy and commitment to teach of a sample of pre-service elementary and secondary teachers.

To sum up, the Teacher Efficacy Scale (Gibson & Dembo, 1984) has been widely used by researchers in studies related to teacher efficacy. Thus, research in teacher efficacy relied largely on quantitative analysis. Besides the controversial measurement issues discussed earlier, such measurement of teacher efficacy is limited by the researchers' conceptualisation of this construct. During teacher education, student teachers are exposed to various pedagogic efficacy. The development may vary according to different personal experiences, value systems and training milieu. Hence, some aspects of mental organisation of a sense of student teacher efficacy may not be taken into account by conventional quantitative measures. There is a need to examine student teachers' sense of efficacy from the perspective of the novice teachers themselves.

Repertory Grid Technique

The psychology of personal constructs, founded by George A. Kelly (1955, Volume One), lays down a fundamental postulate which is further elaborated in 11 corollaries. According to the theory, each person construes (interprets) and anticipates the occurrence of events in accordance with one's own construction system of constructs. The construction system structures an individual's thinking and limits his or her access to the ideas of others at a particular moment of time. Persons may differ in their experiences. Thus, they may have different constructions of what may appear to be the same events. However, when two persons have a similar construction of events, their psychological processes in construing those events are similar to one another.

Repertory grid technique is a method, based on the theory of personal construct psychology, for exploring an individual's personal construction system (Fransella & Bannister, 1977). With this method, it is possible to examine the individual's world of meaning by analysing the organisation of constructs of the individual in any particular context. By means of a repertory grid form, data concerning an individual's perceptions in response to an intended problem of inquiry are collected through some procedures of construct elicitation (Pope & Keen, 1981). The form consists of constructs, a rating scale and elements. A construct is a bipolar abstraction that a person uses to distinguish similar and different perceptions among events (i.e. elements). On the grid form, the two poles—the similarity pole and the contrast pole—are put in columns at either end. Elements are rated in accordance with the extent they belong to either of the poles of a construct. The ratings are placed in a row of cells that come in between and correspond to the construct poles on the form.

Computer programs are available for processing repertory grid data. The RepGrid system (RepGrid 2 Manual, 1993; Shaw, 1989), which was selected for the analysis of this study, consists of three programs—FOCUS, PRICOM and SOCIO. Moreover, as the aim of this study is mainly concerned with comparison of perceptions among a group of student teachers, only the SOCIO program is introduced here. SOCIO is used to explore the similarities and differences in construing the same class of elements between members of a group within the same domain, and to make overt the conceptual network involved in the construct constructions of the group (Shaw & Woodward, 1990). It provides two main sets of output for analysis—socionets and mode constructs. A socionet is a graphical display showing the extent that the construct systems of persons within a group are similar to each other (see Fig. 1 as an example). Mode constructs represent those constructs that are highly similar in perceptual ratings with many other constructs within a set of grids (see Table I as an example). In the computer printout, they are clustered into construct modes, each of which represents a closely related pattern of construct ratings.

This section only offers a brief overview on the repertory grid technique. The design of the technique as to its application to this research will be explained in detail in the Method section.

Aims

The objectives of this study were:

- (1) To investigate teaching efficacy of student teachers who received training in colleges of education in Hong Kong from their own perspectives;
- (2) To analyse structural differences in teaching efficacy in terms of the student

TABLE I. Mode constructs analysis: Year 1 student teachers of NCE (NIP) and TTC (TIS)

Mode	Grids	Rating 1/		Common elements/Ratings											Rating 5/		
		Mode constructs	Mode constructs	1	2	3	4	5	6	7	8	9	10	11	12	Mode constructs	Mode constructs
1	IYY (TIS)	No relation to teaching		5	5	4	1	3	4	1	5	5	2	1	3	Adequate knowledge would enhance my confidence	
1	IYY (TIS)	No effect on me to improve pupils' performance		5	5	2	1	2	2	1	4	5	1	1	2	Enabling pupils to improve	
1	YYM (TIS)	Good relations developed		1	1	5	4	3	5	4	3	1	2	5	5	Comprehension of teaching skills enhanced confidence	
1	WYM (TIS)	No relation to teaching efficacy		4	5	1	1	3	2	1	4	5	2	3	2	To face pupils must accompany with confidence	
1	WYM (TIS)	No relations to managing pupils		4	5	1	1	2	1	1	4	5	3	1	2	If able to manage pupils	
1	CCY (NIP)	Offered knowledge and teaching skills		2	2	4	4	2	4	4	2	2	4	3	3	Western theories at variance with HK pupils' development	
1	WMY (NIP)	Challenging to teaching efficacy		1	1	2	4	3	4	4	2	1	4	5	3	Not challenging to teaching efficacy	
1	WMY (NIP)	Had confidence in teaching		1	1	2	4	3	3	4	4	1	4	5	3	Theories not necessarily suitable for teaching	
2	KCH (TIS)	Learning new knowledge for teaching		3	4	3	5	3	2	5	1	4	5	1	3	A good teacher model to follow	
2	WYM (TIS)	Caused me not serious about work		3	5	4	1	3	4	1	4	3	2	5	3	Caused me earnest in work	
3	IYY (TIS)	No relation to teaching		5	5	4	1	2	4	1	4	5	3	4	2	Pupils' performance affected teaching efficacy	
3	CCY (NIP)	Class discipline causing doubts about my teaching		1	2	3	3	2	3	5	2	1	3	2	4	No relation to class discipline	

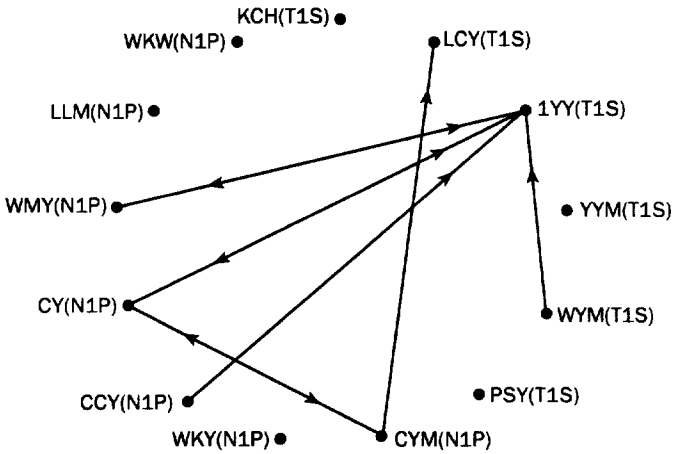
TABLE I. *Continued*

Mode	Grids	Rating 1/ Mode constructs	1	2	3	4	5	6	7	8	9	10	11	12	Rating 5/ Mode constructs
4	WYM (TIS)	Only taught teaching methods, little use	3	4	2	1	5	2	1	5	2	5	4	1	Taught how to teach subject matters
4	WKY (NIP)	Enabled to understand proper teaching methods	3	3	3	4	1	4	4	1	3	1	2	3	Not related to teaching academic subjects
5	WKY (NIP)	Pupils met our expectations	1	2	2	2	2	3	2	2	1	3	3	2	Not able to comprehend some knowledge learnt
5	CCY (NIP)	Teaching methods, more comprehensive	1	2	3	3	2	4	3	2	2	3	2	3	Not comprehensive for teaching

Mode constructs at 85.0; 16 out of 68 self-elicited constructs extracted from seven grids out of 13 grids of the NCE and TTC Year 1 student teachers.

Common elements:

- (1) Self-efficacy
- (2) TP experience
- (3) Education studies
- (4) Teachers' images
- (5) TP supervisors (Electives)
- (6) Methodology
- (7) Lecturers' images
- (8) Electives
- (9) Pupils
- (10) Form teachers
- (11) Lesson plans
- (12) TP supervisors (Methodology)



The acronyms such as KCH stand for a student teacher.
 (N1P) = The first year NCE student teachers teaching primary classes
 (T1S) = The first year TTC student teachers teaching secondary classes
 Arrows indicate construct lines (at least 50% over 80.0)

FIG. 1. The socionet of Year 1 student teachers ($n = 13$) from two teacher colleges.

teachers' training and teaching experiences accumulated in the course of study; and

- (3) To identify factors that would be responsible for the student teachers' development of teaching efficacy.

Within the context of this study, the sense of teacher efficacy represents confidence in performing the role of a teacher through the process of training. The rationale of this approach is that it makes use of an overall sense of teacher efficacy to elicit specific constructs of efficacy.

Method

The idiosyncratic teaching efficacy constructs of the students were elicited in relation to 12 selected common elements. The students' perceptions were compared in groups by means of socionets, while their most prevailing and representative group constructs were examined by using mode constructs. The data processing was done by means of the SOCIO computer procedures (RepGrid 2, Version 2.1b Release, 1993; Shaw, 1989; Shaw & Woodward, 1990).

Sample

The sample consisted of 27 student teachers, of which 13 belonged to the first year and another 14 to the third year (the final year) of the full-time 3 year courses of two colleges of education in Hong Kong. Seven of the first year and eight of the third year students enrolled in the Northcote College of Education (NCE), while the remaining

students of the respective year-group in Hong Kong Technical Teachers' College (TTC). The students, who volunteered to participate in the interviews, were randomly selected among a pool of students on the basis that covered the years of study, various combinations of electives and teaching practice performance evaluation. The students were arranged to teach different class levels during the teaching practice of the academic year (1993–1994). The NCE first year students taught primary classes, while the NCE third year students taught secondary classes from S1 to S3 levels. On the other hand, all the TTC students taught secondary classes; however, some of the commerce students taught commerce subjects up to S4 levels. As a whole, the female to male ratio was 4.6 to 1.

The Repertory Grid Form and Common Elements

A repertory grid form, consisting of elements, construct poles and a rating scale, was used to collect data. The 12 supplied common elements were selected on the basis of a pilot study with a sample of 15 students from the two colleges in April 1994. They served as contextual situations for eliciting constructs for the study. The descriptions of the 12 supplied elements were as follows:

- (1) *Self-efficacy*: This refers to the student teachers' generalised belief of their capability of coping with life events.
- (2) *Teaching practice*: This includes those experiences that the student teachers gained from their practical teaching at a school as part of their training in the (1993–1994) academic year.
- (3) *Education studies*: This was concerned with the course work done in the teacher training colleges that enabled the student teachers to have an understanding of educational ideas and principles, many of which were founded on such disciplines as psychology, sociology and philosophy.
- (4) *Teachers' images*: This refers to the student teachers' perceptions about the teachers who taught them during their previous primary and secondary schooling.
- (5) *Teaching practice supervisors (Electives)*: This refers to the college lecturers from elective departments who provided guidance and assessment for the teaching performance of the student teachers during their visits to schools in the 1993–1994 academic year. Their supervision emphasis would be placed on the adequacy of academic knowledge and teaching skills for teaching subject disciplines.
- (6) *Methodology*: This includes the college course work that prepared the student teachers for acquiring the knowledge of general applications of skills, strategies and methods to teaching.
- (7) *Lecturers' images*: This refers to the perceptions of the student teachers about the lecturers who taught them during their training in college.
- (8) *Electives*: The major aim of electives was to equip the student teachers with knowledge of subject matters, curriculum materials and teaching methods for teaching specialised subject disciplines. Each student teacher was required to specialise in two elective subjects throughout their course of study.
- (9) *Pupils*: The pupils in question were taught by the student teachers in their practising schools during the teaching practice in the 1993–1994 academic year.
- (10) *Form teachers*: The form teachers in question referred to the teachers whose

classes were taken up by the student teachers to teach during the teaching practice in the 1993–1994 academic year.

- (11) *Lesson plans*: During the teaching practice, the student teachers were required to prepare lesson plans for the teaching of each lesson.
- (12) *Teaching practice supervisors (Methodology)*: Their duties were supposedly concerned with guidance and assessment for the students' general teaching performance, such as maintaining proper interactions in instruction, managing class discipline, delivering suitable teaching approaches during the teaching practice in the 1993–1994 academic year. Also, they assessed the students' personality as a teacher. The lecturers, who mainly came from the Departments of Education and Educational Technology, undertook the supervision visits of these supervisors.

Elicitation Procedures

The interviews for construct elicitation took place during June 1994. The student teachers were interviewed individually. They were informed of the objective of the project and, at the same time, were reminded that the information disclosed by them was to be kept in strict confidence. Each interview lasted for less than 1 hour. The construct elicitation followed some particular procedures (Pope & Keen, 1981). At the beginning of elicitation, the interviewee was asked to identify the meaning of each element written on a card. When a meaning was different from that of the researcher's, the interviewee was further asked to make clarifications, which were then recorded. Five cards numbered from 1 to 5 were arranged in a line forming a scale in front of the interviewee, with the smallest number ascending from the left to five on the right. The smaller number indicated the tendency towards similarity pole perception, while the larger number represented the opposite. The numbers were not intended to stand for any quantitative magnitude.

The triad elicitation began with the shuffling of the cards. Three cards, randomly selected at a time, were put in front of the interviewee, who was then asked a question: "In what way are two of the three things indicated on the cards similar in engendering a sense of teaching efficacy in you that makes them different from the third?" The two responses were written on two 'labels'. The label indicating the similar perception was put at the left end pole of the scale, while the contrast was placed at the right. All the elements were then rated according to the extent they belonged to either pole. When an element was felt to have mixed feelings of the two poles, it was rated '3'. Those elements to which the construct could not be applied were excluded from rating; they were recorded as 'NA' on the grid form. Then, the construct and the respective rating for each element were entered into the grid form. The triad form of elicitation continued until all elements were involved in elicitation.

After the triad process was completed, the interviewee was further asked, in front of all elements, if any elements shared a similar perception that had not been mentioned, but would distinguish them from the rest. This was referred to the full context form elicitation. The rating and recording were performed as previously. Elicitation was completed when all relevant constructs had been elicited.

In some instances, the above process of elicitation was varied. An interviewee might express openly a number of constructs in one triad elicitation. The individual constructs were identified and the ratings of elements were allocated to the successive constructs. When an interviewee felt that all applicable constructs were exhausted

shortly after a number of triad elicitation, he or she could be guided to the full context form of elicitation without rigidly engaging in further triad elicitation.

SOCIO (Group Grids Analysis)

The SOCIO analysis, the focus of this study, was concerned with comparing the student teachers' construing of teaching efficacy over the effects of 12 common elements by means of socionets and mode constructs. The sample of 27 student teachers was divided into two groups on the basis of the students' year of study for the analysis.

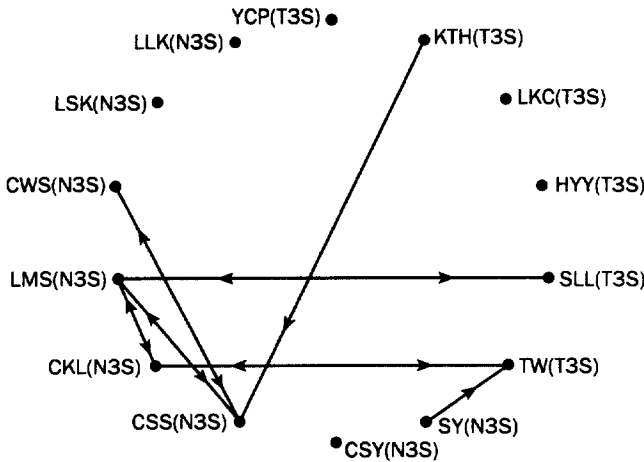
SOCIO, part of the RepGrid system (RepGrid 2 Manual, 1993), is used to explore the similarities and differences in construing between members of a group over some selected common elements (Shaw, 1989; Shaw & Woodward, 1990). It provides two main sets of output for analysis:

- (1) *Mode constructs and modes*: Mode constructs are the representative perceptions over a set of common elements within a group of persons. After a construct of a grid matches with the constructs of other grids, the highest match scores of the construct with other constructs of each other grid are selected and then averaged. The process continues for all constructs of the grids. Mode constructs are those constructs that have an average of the highest match values at or above a pre-determined match level with other constructs for the common elements. After the extraction of mode constructs, the analysis will proceed to have mode constructs with similar ratings clustered together to form construct modes. Thus, a mode suggests a cluster of mode constructs having similar construing over a set of common elements.
- (2) *Socionets*: SOCIO derives a sequence of diagrammatic socionets showing the extent that each person has common construing over a set of common elements with other persons in a group. Within each socionet, arrows link individuals with each other, indicating that their constructs are highly matched with each other under some pre-selected criteria. When an arrow points from one person to another, each construct of the person (the star) at one end of the arrow matches with the constructs of the person being pointed at. Then the pairs of constructs with the maximum match value are chosen. The arrow indicates that at least a proportion of the highest match pairs is over a certain match level. On the other hand, when a person (the isolate) is not linked with arrows, the match of constructs between that person and the other persons in the group is below the criteria. Thus, the 'isolate' barely has any common construing with the others.

For this study, the minimum match value for the socionets was set at 80 in order to enable construct links to be prominently displayed, whereas the minimum match value for the mode constructs was selected at a higher value of 85 so that interpretations could be simplified while, at the same time, retaining a considerable amount of constructs.

Results

In Fig. 1, the socionet obtained consisted of 13 first year students, of which seven belonged to the Northcote College of Education (NCE) and another six to Hong Kong Technical Teachers' College (TTC). Four of the NCE students had construct links,



The acronyms such as YCP stand for a student teacher.
 (N3S) = The third year NCE student teachers teaching primary classes
 (T3S) = The third year TTC student teachers teaching secondary classes
 Arrows indicate construct lines (at least 50% over 80.0)

FIG. 2. The socionet of Year 3 student teachers ($n = 14$) from two teacher colleges.

three of which were connected with the constructs of the TTC student, IYY(TIS), one was matched to another TTC student, while the remaining construct link was between two NCE students, CY(NIP) and CYM(NIP). Also the constructs of IYY(TIS) were matched by another TTC student, WYM(TIS). The constructs of LCY(TIS) were matched by the NCE student, CYM(NIP). The remaining six first year students in the socionet were isolates.

In Fig. 2, the socionet was composed of 14 third year student teachers, of which eight were NCE students and another six were TTC students. Four of the NCE students were connected with reciprocal links among themselves, that is, CSS(N3S) with CWS(N3S) and LMS(N3S), and LMS(N3S) with CKL(N3S). Furthermore, the constructs of CSS(N3S) were matched by those of the TTC student, KTH(T3S), while those of another two NCE students were connected separately with another two TTC students, that is, LMS(N3S) with SLL(T3S), and CKL(N3S) with TW(T3S). The constructs of TW(T3S) were matched by those of SY(N3S). There was little similarity in teaching efficacy construing among the TTC students. The remaining six third year students in the socionet were isolates.

Another part of the SOCIO analysis was concerned with identifying the most prevalent or representative views of the student teachers' sense of teaching efficacy through the extraction of mode constructs. In Tables I and II, each row represents a mode construct obtained from the grid of a student teacher along with ratings for the 12 common elements indicating their inclination towards either of the two poles of the mode construct. Moreover, the mode to which certain mode constructs belong is shown at the farthest left-hand column.

Table I depicted the mode clusters of the first year students of the two colleges. A total of 16 mode constructs were extracted from seven of the 13 grids, which contained

TABLE II. Mode constructs analysis: Year 3 student teachers of NCE (N3S) and TTC (T3S)

Mode	Grids	Rating 1/ Mode constructs	Common elements/Ratings										Rating 5/ Mode constructs				
			1	2	3	4	5	6	7	8	9	10		11	12		
1	YCP (T3S)	Afraid of not making communication with pupils	1	3	5	2	5	5	4	2	2	4	2	4	2	4	No relation to confidence
1	KTH (T3S)	No relation to teaching efficacy	5	5	2	3	4	2	2	4	4	1	4	3	3	3	More teaching experience
1	HYY (T3S)	1st teaching experience, significant	1	1	5	2	5	4	5	2	1	4	2	5	2	5	No relation to practice
1	SY (N3S)	Gave successful feelings	1	2	2	3	2	2	2	4	3	3	3	1	1	1	Feared teaching plans not achieved
1	CSS (N3S)	No effect on teaching	3	4	2	3	3	3	2	5	4	2	4	3	3	3	Had effect on teaching
1	CSS (N3S)	Not much influence on my teaching moods	4	4	3	1	3	3	1	4	4	2	4	3	3	3	Pupils' emotions affected my teaching moods
1	CSS (N3S)	Guidance not reflecting needs for teaching academic subjects	5	3	2	2	4	3	3	5	3	4	4	3	3	3	More academic knowledge enhanced teaching efficacy
1	CSS (N3S)	Not much relation to pupils' respect for my teaching	4	4	2	1	2	2	1	4	5	3	3	2	2	2	Pupils not fulfilled my expectations
1	CSS (N3S)	Not much relation to pupils' respect towards me	5	4	2	3	2	2	1	4	5	3	3	2	2	2	Pupils' respect would strengthen efficacy
1	LMS (N3S)	No effect on teaching	4	4	3	2	4	3	2	5	4	2	3	3	3	3	Subject matters learnt useful for lesson planning
1	LMS (N3S)	No relation to teaching preparation	5	4	2	1	4	3	2	5	4	3	3	3	3	3	Preparations enabled development of confidence
1	LMS (N3S)	No relation to subject matters and pupil academic ability	5	4	3	1	4	2	1	5	5	3	3	3	3	3	Pupil and teacher's academic ability affected confidence

1	CWS (N3S)	Pupil responses affected teaching efficacy	2	4	4	4	4	4	3	2	3	3	4	I was not prepared with adequate teaching skills
2	LKC (T3S)	Their comments helped to improve teaching	3	1	3	5	1	3	5	2	2	5	4	Their performance as a reference for me
2	TW (T3S)	Practice affirmed teaching efficacy	1	1	2	5	1	2	2	1	1	5	2	No relation to teaching
2	TW (T3S)	Their assessment affected efficacy	1	1	2	5	1	2	2	1	1	5	1	No relation to assessment
2	TW (T3S)	Pupil discipline undermined confidence	1	1	2	5	2	2	2	2	1	5	2	No relation to class management
2	TW (T3S)	Self-confidence affected teaching efficacy	1	1	2	5	1	2	5	2	1	5	2	No relation to teaching confidence
2	SY (N3S)	Communication with pupils caused to have confidence	1	1	1	5	2	1	3	3	1	5	3	Teachers lacked teaching ideals
2	SY (N3S)	To become a committed teacher	1	1	2	4	4	2	2	3	1	5	3	Not influenced my fervour for teaching
2	CKL (N3S)	Pupils liked me teaching them	1	1	3	5	2	3	3	1	1	5	1	No relation to pupils' liking of my teaching
3	LMS (N3S)	No effect on class discipline	5	4	3	3	3	4	2	3	5	4	2	Class discipline affected my teaching efficacy
3	CWS (N3S)	Teaching progress would be interrupted by discipline	2	3	4	3	3	2	2	3	2	2	3	Understanding child psychology facilitated teaching

Mode constructs at 85.0; 23 out of 71 self-elicited constructs extracted from 10 grids out of 14 grids of the NCE and TTC Year 3 student teachers.

Common elements:

- (1) Self-efficacy
- (2) TP experience
- (3) Education studies
- (4) Teachers' images
- (5) TP supervisors (Electives)
- (6) Methodology
- (7) Lecturers' images
- (8) Electives
- (9) Pupils
- (10) Form teachers
- (11) Lesson plans
- (12) TP supervisors (Methodology)

a total of 68 constructs. They were clustered into five modes. In Mode 1, the eight-mode constructs were derived from the grids of three TTC students and two NCE students. The construct poles suggesting the construing with effective teaching efficacy included the perceptions of the needs of adequate knowledge and comprehension of teaching skills, enabling pupils to improve learning performance, ability to manage pupils, confidence in facing pupils and challenges to teaching efficacy. These poles were mainly associated with the elements of self-efficacy, teaching practice experience, electives and pupils. The remaining eight elements were sparsely related to the effectual construct poles. In particular, however, the elements, including education studies, methodology, preparation of lesson plans, the images of previous teachers and lecturers and form teachers, predisposed the students to have the idea that the applicability of educational theories to teaching and pupils' development in Hong Kong situation would be in doubt.

Mode 2, whose constructs were extracted from the grids of two TTC first year students, suggested the meanings of work earnestness, the importance of a good teacher model and learning new knowledge for teaching. The teaching practice caused the students to feel the strong need to be a good teacher and to work in earnest. However, the students held contradictory impressions of their previous teachers, college lecturers and form teachers for the mode constructs in that one of them saw the mentors as a good model to follow, whereas the other one thought that the mentors caused them to become less serious about work. Methodology, electives and preparation of lesson plans predisposed the students to realise the importance of learning new knowledge for teaching and working in earnestness. Education studies inculcated the attitude of work earnestness in the student. Self-efficacy, teaching practice supervisors were related to mixed pole feelings of the mode constructs.

Mode 3, consisting of two mode constructs, were derived from one NCE and another TTC first year students. The two students were of the opinion that the elements of self-efficacy, teaching practice experience, electives, pupils and preparation of lesson plans were related to the effects of pupil performance and class discipline on their teaching efficacy. The other elements were either variably associated with or bore no relation to the effects.

Modes 4 and 5, extracted from the grids of one TTC student and three NCE students, appeared to be similar in meaning, suggesting the relation of teaching efficacy to understanding of teaching methods, teaching academic subjects, enabling pupils to learn and to meet instruction expectations and comprehensive teaching methods. These perceptions were largely associated with the effects of teaching practice experience, teaching practice supervisors (Electives), electives and preparation of lesson plans. The remaining elements were diversified in their relationship with the effectual construct poles.

Table II shows the mode constructs of the third year students. A total of 23 mode constructs, obtained from 10 grids, were extracted from 71 constructs in 14 grids of the students. These constructs were clustered in three construct modes. In Mode 1, the 13 mode constructs were derived from seven grids, of which three grids belonged to the TTC students and another four grids to the NCE students. They represented a conglomeration of constructs, in relation to the sense of efficacy, conveying the meanings of making communication with pupils, the importance of teaching practice, teaching success, the effect of pupils' emotions on teaching moods, the needs of academic knowledge for teaching, pupils not fulfilling the teacher's expectations, pupils' respect towards the teacher, knowledge learnt being useful for lesson planning,

the effect of lesson preparations on confidence, academic ability of pupils and the teacher and inadequacy of teaching skills. These mode constructs were predominantly related to the effects of the elements of self-efficacy, teaching practice experience, electives and pupils. The work of teaching practice supervisors (Electives) was associated with the students' feelings of gaining more teaching experience, teaching success, the needs of academic knowledge, lesson preparations and being not prepared with adequate teaching skills. The students' preparation of lesson plans posed a strong relation to making communication with pupils, gaining more teaching experience, the effect of pupils' emotions and the needs of academic knowledge. The other elements bore relatively little relation to most of the construct poles indicating the effectual effects on the sense of efficacy.

Mode 2 consisted of eight mode constructs, of which two belonged to two TTC and another two NCE students. It implied a series of meanings that involved constructive comments for teaching improvement, referential performance, the importance of practice, teaching practice assessment, pupil discipline problems, self-confidence, communication with pupils, teachers lacking teaching ideals, teaching commitment and pupils' acceptance of the teacher's teaching. Except for the elements of the students' previous teachers and lecturers, the other elements possessed substantial relation to the effectual efficacy construct poles.

Mode 3, derived from the grids of two NCE third year students, mainly suggested the effect of class discipline on teaching. The elements of self-efficacy, teaching practice experience, methodology, pupils and form teachers were to have a stronger relation to the management of class discipline than the other elements.

Discussion

The comparisons of the student teachers' idiosyncratic views of teaching efficacy were shown in two diagrammatic sociocnets. Referring to the sociocnet of the 13 first year students in Fig. 1, there were construct links between two TTC students and four NCE counterparts, whereas only one pair of TTC students and another pair of NCE students had construct correspondence within the same college. From this observation, it is therefore interesting to find that fellow students, supposedly receiving similar training at the same college, shared less common views, regarding the effects of teaching experiences and curriculum training on the sense of teaching efficacy, than did students between the two different colleges.

The first year students of the two colleges underwent somewhat different training emphases. The focus of training for the NCE students was on primary curriculum and they taught in primary schools during the teaching practice, whereas that for the TTC students was on secondary curriculum and they taught in secondary schools during the practice. Apparently, the diversity of views, especially among students of the same college, would suggest that the college curricula and teaching practice guidance, occupying the majority of the common elements, were at least far from being salient in engendering a coherent sense of teaching efficacy. Among the 12 common elements, only electives of the college curricula, together with the other three common elements (self-efficacy, teaching practice and pupils), shared relatively similar influence on the students' sense of efficacy (see Table I). Maybe, the first year students were only given a brief orientation to teaching due to their initial teaching practice experience and short period of time in college. The educational ideas and teaching methods that the students

had learnt so far appeared to remain sketchy and to be of little influence to them. It may be premature at such an early stage to expect many of the students to have integrated what they had gained from the teacher education courses and guidance of supervisors into their teaching experiences, in order to realise the effects of the learning on their sense of teaching efficacy.

The analysis of the socionet of the 14 third year students (see Fig. 2) revealed that there was common teaching efficacy construing among half of the NCE students as well as between a number of students of the two colleges, but barely any among the TTC students. After 3 years of study, it would be expected that the third year students of the colleges should have received similar training. Except for the teaching practice arrangement in the first year course of study, both the third year students of the two colleges had been prepared with a focus on secondary curricula and they had engaged in teaching secondary classes during the teaching practices in the last 2 years of study. It can be speculated that the increasingly prominent construct links among the third year students, as compared with the first year students, may suggest professional maturity. Many of the sketchy ideas, as mentioned earlier, that had been acquired in the previous course of study appeared to become more integral to some of the third year students, especially to the NCE students, as the students gained more training and teaching experiences. Thus, the third year students should be more likely to share common views as to what training and teaching experiences contributed to their development of teaching abilities and, hence, to teaching efficacy.

The previous observations are also supported by the mode analysis of the third year students (see Table II) in that the students perceived more college curricula, in addition to the elements of self-efficacy, teaching practice and pupils, contributing to development of their sense of teaching efficacy than did the first year students. The curriculum elements included teaching practice supervisors (Electives), electives and preparation of lesson plans. Thus, it appears that the length of college training and teaching experiences warranted the commonality among the third year students' teaching efficacy construing.

On the whole, the impact of course curricula and teaching practice experiences varied more for the TTC students' development of teaching efficacy than the NCE students'. These results would be due to a situation in which the TTC students might have undergone their learning experiences in a much less advantageous position than the NCE students. It is possible to infer this latter assumption from the data of a quantitative analysis concerning a large sample of about 600 first and third year full-time 3-year course student teachers from the four colleges of education in Hong Kong (Yeung, 1997), of which the present sample was a part. Some observations regarding the views of the entire sample of TTC students on their training conditions in comparison with those of the NCE students are summarised as follows: they considered their teaching abilities being not quite adequate; the pupils taught by them were of low and wide range of academic abilities; they were not quite respected by the pupils; and their learning from such sources as methodology, education studies, electives, guidance by electives and methodology teaching practice supervisors only played a marginally effective role in classroom instruction. These unfavorable factors might have prevented many of the TTC students from encountering teaching success. As a result, it would be difficult for the students to make use of the opportunity for integrating what had been learnt from training into their teaching experiences. Accordingly, the present sample of TTC students' lack of teaching success and effective learning in college curricula, as alluded from the quantitative analysis, might not lead

to the formation of coherent views concerning the efficacy of various pieces of course work and guidance. Hence, the construing of teaching efficacy of the TTC students was more diversified than that of the NCE students.

Before discussing the contents of the student teachers' sense of teaching efficacy, it should be noted that the constructs of the first year students were clustered into more modes, but fewer mode constructs within each mode than those of the third year students (see Tables I and II). This suggests that there were more variations in the influence of the common elements on the first year students' development of teaching efficacy than on the third year students'. In other words, the first year students, as discussed earlier, were more variously susceptible to the effects of college curricula and teaching and supervisory experiences than were the third year students.

The mode constructs depicting the commonest perceptions of teaching efficacy in relation to the effects of the 12 common elements were analysed separately for the first year and third year students (see Tables I and II). The contents of the first year students' mode constructs centred on the adequacy of their teaching skills in general, their knowledge and teaching of academic subjects, their concern for pupils' learning, their management of class discipline, and their work commitment. It appears that these perceptions were based more on concerns of their own competence than on their pupils' learning outcomes. On the other hand, the mode constructs of the third year students tended to show more varied, substantial and pupil-centred conceptions than those of the first year students. There were indications that showed their concern for their pupils' reactions to their teaching, such as communicating with pupils, the effect of pupils' emotions on their teaching, the pupils' respect shown to them, the pupils' fulfilment of the teacher's expectations and the pupils' acceptance of the teacher's teaching. Other perceptions relating to their sense of efficacy included the importance of academic knowledge and skills for teaching, lesson planning and preparation, teaching success, outside constructive comments for teaching improvement, teaching practice assessment, managing discipline problems and teaching commitment. A number of views were expressed about the significance of teaching practice to the development of teaching efficacy. Altogether, these conceptions seemed to be composed of the meanings of self-concern of competence and external institutional demands. They also suggested the third year students' capability of differentiating between college demands on training fulfilment and indigenous classroom learning needs.

Research into teachers' sense of teaching efficacy has relied heavily on the use of structured questionnaire for quantitative analysis (e.g. Gibson & Dembo, 1984). This approach undermines the unique, diversified, phenomenological views that may be involved in teacher efficacy. For this study, however, the mode constructs preserved the idiosyncrasy of the student teachers' thoughts relating to teaching efficacy. At the same time, the diversified meanings as implied in the mode constructs would suggest possible dimensions of training experiences that were related to the development of a sense of teaching efficacy. Taking into account the overall views of the two year-groups, we may classify the mode constructs into a number of dimensions that denote the meanings of adequacy of pedagogical skills and knowledge, pupils' instructional participation and learning needs, communication and relationships with pupils, management of class discipline, teaching success, instructional preparation and teaching commitment. Rarely do we find a tailor-made instrument for measuring student teachers' sense of teaching efficacy. Views such as those reported in this study could serve as a framework for the formulation of a student teacher efficacy measure which reflects the student teachers', rather than a researcher's, perspective. It is possible that a

questionnaire design based on the mode constructs of this study may suggest that there exists dimensions of teacher efficacy that go beyond the conceptualisation of the two dimensions identified in the Gibson and Dembo's (1984) study. This echoes the conclusions arrived at by such studies as Woolfolk and Hoy (1990), Rich *et al.* (1996) and Soodak and Podell (1996), discussed earlier.

As regards the effects of the common elements, only the student teachers' self-efficacy, teaching practice experience, electives and pupils suggested a major influence on teaching efficacy for both the first year and third year students. Self-efficacy is likely to be developed from daily life experiences and personal relationships. Its influence would also be felt in teaching situations. Thus, the development of teaching efficacy should partly be attributed to the students' capability as well as confidence in dealing with daily matters and relationships. Teaching practice also played a significant role in developing the student teachers' teaching efficacy. In fact, the analysis of mode constructs showed that beliefs about teaching capability were mainly acquired through their teaching and observations of pupils' learning. Among the course work undertaken in college, the learning from electives seemed to contribute more to developing the students' sense of efficacy than did subjects such as education studies and methodology. As school teaching in Hong Kong concentrates mainly on learning academic subject matters, the instructive approach adopted by electives, offering opportunities for learning how to integrate teaching methods and academic subject matters, was effective in the students' practice teaching.

On the other hand, the teachings of education studies and methodology appeared to have less effect on the students' sense of efficacy. This may be because such studies were too theoretical and overly based on Western research. They would thus easily be perceived as less applicable to local classrooms. This view was expressed either explicitly or implicitly by a number of students in the mode constructs. It seemed that the college curriculum planning in these areas followed the intention of equipping the student teachers with a repertoire of educational knowledge and skills so that the students could flexibly master different instructional conditions (Darling-Hammond & Hudson, 1988; Joyce *et al.*, 1981; Wolfgang & Glickman, 1986). If development of teaching efficacy in student teachers is an important aim of teacher education, the selection of educational theories, knowledge and teaching skills should serve the purpose of not only broadening the knowledge base of student teachers, but also of promoting applicability of what is learnt from the college curricula to teaching preparation that adequately reflects local classroom learning needs. In doing so, the concern for enhancing student teachers' professional competence and, hence, their sense of teaching efficacy would be given due consideration. To achieve this objective, local research in student teaching and learning of pupils has to be encouraged in order to obtain findings to justify if a curriculum decision works within the framework of teaching effectiveness.

Despite the above analyses of the college curriculum problems, the three subjects (elective subjects, education studies and methodology) also influenced the development of a number of teaching efficacy constructs, but somewhat differently for the first and third year students. For the first year students, the subjects were related to a number of perceptions that suggested a need of adequate knowledge and comprehension of teaching skills, enhancing the student to work in earnest, and pupils' performance in learning. In the case of the third year students, the subjects predisposed the students to the opinions relating to inculcating teaching commitment, assessment, support for developing self-confidence and the influence on communication with pupils. As far as

management of class discipline was concerned, the problem, as raised by a number of students of the two year-groups, produced undesirable effects on the sense of teaching efficacy. The subjects should have paid sufficient attention to preparing students to cope with class discipline problems.

During the teaching practice, the supervisors (Electives and Methodology) offered guidance and assessment for the students' teaching performance while visiting them in schools. Over the span of about 1 to 2 months, they were expected to coach student teachers for at least two visits each, totalling more than 60 visits for each supervisor in most circumstances. Two supervisors of different elective subjects and a methodology supervisor would visit each student teacher on the average. As noted in the analyses of mode constructs (see Tables I and II), the supervisors were much less influential in developing the students' sense of efficacy than were the electives.

Given an average of two classroom observations, the supervisors' evaluation and guidance were based on a small segment of the lessons taught by the students. Would they be able to cover the major concerns and problems of the student teachers' teaching as teaching performance is contingent on unique and multifaceted factors? If they were able to, did they offer sufficient follow-up work to ensure the extent that their comments and suggestions were conducive to teaching improvement? In addition to the supervision workload, many supervisors were also having other teaching and administrative duties during the practice period. Would they manage to engage sufficient time and effort to hold detailed discussions with the student teachers after each class observation? Given the subjectivity nature of supervision, would the supervisors be aware of the extent to which the student teachers accepted their suggestions? It is sensible to realise that any suggestions and comments from the supervisors would become part of the student teachers' core belief structure of competence under the circumstances that those teaching approaches and strategies as suggested by the supervisors can be testified in classroom reality by way of helping the students rectify instructional problems and improve teaching performance. Thus, to ensure supervision is functional, substantial advice should be built on thorough understanding of student teachers' instructional concerns through detailed and open discussion after each supervision visit accompanied by careful monitoring of teaching progress.

Although the teaching practice supervisors (Electives) at the same time provided instruction through their respective elective subject as well as on-the-spot classroom practical guidance for the student teachers, they were not considered as effective as the influence of elective subjects themselves in developing the student teachers' sense of teaching efficacy. Nonetheless, they were more effective in engendering the sense of efficacy in the students than the methodology supervisors. Perhaps the elective supervisors were, to some extent, in a more advantageous position as they would put into effect ideas, suggestions and comments with an emphasis on teaching academic subject matters that could be useful for lesson planning, teaching improvement and pupils' learning. This raises the query of whether there is a need for the demarcation of 'specialised subject' and 'general' supervisions in teaching practice.

The third year students in particular often stressed the profound effects the elective and methodology supervisors had on their development of teaching efficacy. It might be suggested that the third year students, having more educational knowledge and teaching experience, were able to discriminate and affirm the effects of the supervisors' (Electives and Methodology) guidance. However, it appeared that both the supervisors needed to consider effective remedies for coping with class discipline as a number of the students expressed concern that class discipline was a handicap to their teaching.

Regarding the effect of preparation of lesson plans on the development of teaching efficacy, the students varied in their opinions. Those students who advocated the importance of writing lesson plans to the development considered that the work was effective in comprehension of teaching skills, teaching academic subjects, and enhancing work earnestness and teaching commitment.

On the whole, the impressions of the student teachers' previous school teachers, college lecturers and form teachers played a rather insignificant role in the development of teaching efficacy. Only a few constructs of the students implied positive effects of the mentors on the development. Even though quite a lot of the students' learning should be derived from their lecturers and school teachers of the past, it seemed that they made distinctions between the attribution of the learning to the teaching and the personal entity of the mentors. Many of them tended to attribute the learning of knowledge, teaching methods and educational ideas to college course studies rather than to the lecturers. As regards the form teachers in practice schools, they were under no obligation to offer guidance and supervision for the students. How much assistance they gave to the students depended very much on the individual arrangement of the schools. It should be noted that if sufficient provision of guidance and assistance from school teachers had been made available to trainees while the practice was taking place in school, the learning opportunities offered by the veteran teachers would have been invaluable to the novices.

Conclusions

The SOCIO analysis of repertory grid technique has demonstrated its capacity in this study for investigating the development of teaching efficacy of a sample of student teachers. It provided a three-dimensional analysis, which included mode constructs depicting idiosyncratic perceptions, comparison of construing among the grouping of students within diagrammatic socionets, and factors responsible for the development. The contents of mode constructs, suggesting diversified views associated with the effects of the common elements, could be categorised into a number of domains, namely adequacy of teaching skills and knowledge of subject matters, concern for pupils' learning, reactions of pupils towards the teacher and teaching, communication and relationships with pupils, management of class discipline, teaching success, lesson preparation and teaching commitment.

As noted in the analysis of mode constructs and socionets, professional maturity evolved in the course of training as some of the third year students, in comparison with the first year students, revealed the capability of devoting substantial attention to learning needs of and relationships with pupils in addition to the concern of self-competence in teaching. These students appeared to become more child-centred, at the same time possessing confidence in meeting institutional demands on their teaching performance.

Among the elements that belonged to the college curricula, elective subjects were exclusively considered by the students as effective in engendering the sense of teaching efficacy in them. On the contrary, the teaching of education studies and methodology played a rather minor role in the development.

It is beyond doubt that the teaching practice was significant to the students' development of teaching efficacy. Nonetheless, quality of school pupils taught by the student teachers during the practice appeared to play a rather decisive factor for the development. As far as the effect of teaching practice supervisors (Electives and

Methodology) is concerned, only a few of the students perceived the supervisors as effective in helping them to cope with their teaching concerns, such as improvement of teaching performance and management of class discipline. Lastly, the school form teachers' insignificant role in the development of teaching efficacy was clear, and it may be well be due to their not being asked to provide guidance to the student teachers.

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NOTES

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