Can we use case method for all preservice teachers? The influence of preservice teacher's characteristics on case learning

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ABSTRACT
This study is to explore the influence of student characteristics on case learning. How do the influence of gender, experience, major and learning style on pre-service teachers' case learning? There are thirty-seven preservice teachers in the Elementary Education Program of Center for Teacher Education at National Dong-Hwa University in Taiwan participated in this study. The results show that there is difference between pre case discussion decision making and post case discussion decision making and decision making perspectives. There is no difference in the influence of pre-service teachers' gender, teaching experience, and learning styles on case learning. That is, case method is effective for all preservice teachers, no matter what characteristics are they. However, all learning styles except for assimilating learning style have more pre-service teachers changed than no changed. Does it indicate that assimilating learning style pre-service teachers might have difficulty to learn from case method because they in favor of abstract concepts instead of real case? More researches are needed for understanding the influence of pre-service teachers' learning style on case learning.

Key words: case method, preservice teacher, case learning, learning styles

INTRODUCTION
The school is a site of the clashing of modern and postmodern worlds, a clash which presents teachers with conflicting demands that make it increasingly difficult to form a professional identity. A case is a made for a respectful teacher education, one that focuses on self-formation process, engages beginning teachers in exploring their beliefs and the contexts within which they learn to teach in relationship to their moral responsibilities to care for and educate young people (Bullough, 1997).

Pre-service teachers must learn to deal with the many dilemmas they will encounter in the course of their work. They cannot come to understand the dilemmas of teaching only through the presentation of techniques and methods. Conditional knowledge and a way of knowing that reflect and address the complex context and moral embededness of teaching and learning are also required (Harrington, 1994; Houtown, 1990; Reynolds, 1989; cited from Harrington, 1995, p. 203). The case method has been recommended as an addition to pre-service programs which may overcome some of the limitations of field and clinical experiences while facilitating the professional development of teachers (Buchmann & Schwille, 1983; Doyle, 1977; Feiman-Nemser & Buchmann, 1986; Carter, 1988; Carter & Richardson-Koehler, 1989; Doyle, 1986; J. Shulman, 1987; L. Shulman, 1987; cited from Harrington, 1995, p. 203).

Cases represent the problems, dilemmas, and complexity of teaching something to someone in some context. Cases are richly detailed, contextualized, narrative accounts of teaching and learning (Levin, 1995). It conveys contextual knowledge to pre-service teachers and provides them with opportunities to develop an understanding of the situatedness of evidence, the interrelationship between theoretical and practical knowledge, and the moral nature of teaching (Fenstermacher & Richardson, 1991; Harrington & Garrison, 1992; Shulman, 1986; cited from Harrington, 1995, p. 203).

Cases based on dilemmas may meet these goals most effectively. Dilemmas present situations for which there are competing, often equally valid solutions. Using dilemma-based cases in pre-service programs helps students begin to understand and accept the tentativeness in knowing, with certainty, what action to take; provides opportunities to marshal and evaluate evidence for judging alternative interpretations and actions; and can illuminate the moral dimensions of teaching (Harrington, 1995, p. 204).

This paper explores how do gender, teaching experience, major and learning style of pre-service teachers influence on their dilemma-based case learning.

PERSPECTIVE

Research in teacher education classrooms has produced a number of early findings about the influence of cases on what teachers think. For example, researchers have discussed case use to develop multicultural perspectives (Noordhoff & Kleinfeld, 1991), knowledge about motivation (Richardson, 1993), formal authority (Barnett & Tyson, 1993a, 1994), and management (Stoiber, 1991). In addition, some research has focused on how cases can foster deeper understandings of theories and the relationship between theory and practice (McAninch, 1993). Finally, important work has examined the ability of cases to develop pedagogical content knowledge. (Barnett & Cwirko-Godycki, 1988, pp. 29-30; Bamett, 1991a, 1991b; Ingvarson & Fineberg, 1992; Kleinfeld, 1992a; Wilson, 1992; cited from Merseth, 1996, p. 730).

The literature identifies at least four aspects of cases that influence how teachers think. These include developing problem-solving and decision-making skills, increasing awareness of multiple perspectives and other educational settings, enhancing beliefs about personal authority and efficacy, and developing habits of reflection (Merseth, 1996, p. 731). This paper intends to explore how the case-based pedagogy influences pre-service teachers' problem-solving and decision-making skills, and their increasing awareness of multiple perspectives and other educational settings.

One widely acclaimed advantage of case-based pedagogy is its effectiveness in helping students develop skills of critical analysis, problem solving, and strategic thinking (Christensen & Hansen, 1987; Greenwood & Parkay, 1989; Hunt, 1951; Kowalski et al., 1990; McNair, 1954; Merseth, 1991b; Silverman et al., 1994; Wasserman, 1994). Hunt (1951, p.178; cited from Merseth, 1996, p. 732) offered a listing of specific problem-solving characteristics:

> *The power to analyze and to master a tangled circumstance by selecting*
> *the important factors... The ability to utilize ideas, to test them*
> *against the facts of the problem, to throw both ideas and facts into*
> *fresh combination , . for the solution of the problem....The ability to*
> *recognize a need for new factual material or the need to apply*
> *technical skills. . . . The ability to use the later experiences as a test*
> *of the validity of the ideas already obtained.*

In addition, cases can help teachers become aware of unfamiliar settings and that cases can help students of teaching appreciate perspectives other than their own (Noordhoff & Kleinfeld, 1991; Shulman & Colbert, 1987, 1988; Shulman & Mesa-Bains, 1990; cited from Merseth, 1996, p. 732).

Merseth (1991b, p. 17) observed:

> *"Good cases and skillful instruction work as an antidote to oversimplification, moving students toward greater sensitivity to context and uniqueness. This technique exposes learners to differing interpretations of complex situations*
> *and provides them an opportunity to examine and to rehearse the skills required of effective teachers."*

Two theories that have been used to describe how one learns from cases are based on the process of conceptual change and cognitive flexibility theory. The theory of conceptual change considers learning to be a process of inquiry through which students' conceptions change under the impact of new ideas and new evidence (Posner et al., 1982). According to Posner and his colleagues (1982), teachers must introduce new concepts and ideas in ways that create cognitive dissonance and counter the images and beliefs that novices already hold if they want students to modify their strongly held beliefs. In order for change to occur, students would then have to view their own existing conceptions with some dissatisfaction before seriously considering a new one. (Boling, 2007)

Cognitive flexibility theory has been used to describe how one learns from cases. Spiro et al. (1988) developed the theory of cognitive flexibility to describe how people acquire the advanced knowledge needed when dealing with complex conceptual materials in ill-structured domains. They argued that advanced knowledge acquisition is different in many important ways from introductory learning and that the characteristics of advanced learning are often at odds with the goals and tactics of introductory instruction. They claimed that during the learning process, novices frequently make oversimplifications and develop an overreliance on top down processing (Boling, 2007). The process of conceptual change and cognitive flexibility theory can be used to describe the various ways in which people learn from dilemma-based cases.

Although there are claims on the above advantage of dilemma-based case pedagogy, very few researchers have explored the veracity of the above claims (Merseth, 1996, p. 732). Kleinfeld (1991a) asserted that the students in the case section were able to spot issues in problematic situations and to identify possible alternatives for action. However, they did not rate the case methods class more favorably than the conventional discussion or control classes. Welty, Silverman, and Lyon (1991) conducted a small study to examine the ability of cases to help students appreciate a broader range of perspectives in certain educational dilemmas. They asserted that the greater use of phrases such as "could," "might have," and "perhaps," as well as the acknowledgment of more than one or two perspectives on a particular issue, could indicate broadened awareness. Merseth (1996) indicates that their methodological approach is experimental, therefore the results from this work were inconclusive.

The above literature indicates that the use of case might or might not influence on what teachers think and how teacher think. There are researches on the claims about the context in which individuals consider cases. It includes a small but growing body of literature about the method itself, exploring the role of the learning community and the influence of various factors, such as experience, age, or gender, on the experience of case users (Merseth, 1996, p.729). This

paper intends to address the influence of pre-service teachers' characteristics including gender, experience, major and learning style on case learning.

Gender, age, and teaching experience

The influence of gender, age, and experience on learning stimulated by case discussions are explored by several researchers (Kleinfeld, 1991a; Levin, 1993; Lundeberg & Fawver, 1993). Lundeberg and Fawver (1993) found that women generated significantly more decisions and identified more issues than did men. They also found that older students generated more than twice the number of issues and decisions as did younger students. However, these results contradict those of Kleinfeld (1991a), who found no differences between traditional and non-traditional age students, and of Richardson and Kile (1992), who found greater benefits for traditional age students. Merseth (1996, p. 62) indicated that it is unclear, however, how readily a form of pedagogy developed for the graduate education of elite men at Harvard Business School can serve as a model for teacher education. The special challenges of promoting intellectual growth among primarily non-elite undergraduates, the majority of whom are women, have yet to be criteria for examining case methods in other fields.

Another context issue relates to the influence of previous professional experience on case users. Many case teachers in other professional fields, such as business, have suggested informally that case methods are more successful with practitioners who have had previous professional experience. Exploring this topic in education, Levin examined the differences elicited by case discussions in the thinking of eight student teachers, eight first-year teachers, and eight experienced teachers. She found that less experienced teachers exhibited thinking that was more declarative, critical, and less complex than the more experienced teachers: For very experienced teachers, discussion of the case seemed to be a catalyst for reflection and promoted meta-cognitive understandings of important issues in teaching and learning. For the less experienced teachers in this study the case discussion appeared to allow these teachers to clarify and/or elaborate their thinking about particular issues in the case. (Levin, 1993, p. 204).

Moje and Wade (1997) examined differences and similarities that appear between in-service teachers and pre-service teachers in their discussions of different cases. The in-service teachers connect the cases exclusively to their own teaching experiences and become emotionally involved. In contrast, pre-service teachers include their own experiences as students in the discussions; they also relate to course texts and theories that they have come across during their teacher education. Both groups point out that it is important for the teacher to understand the diversity of pupils' needs and abilities. At the same time, they describe knowledge and the intellectual abilities of pupils as something fixed and insusceptible. Moje and Wade (1997) state that it is also interesting what the participants in the study don't talk about and assert that neither the in-service teachers, nor the pre-service teachers mention gender, ethnicity or class in their discussions about the cases (Andersson, K. et al., 2009). Merseth (1996) suggested that additional research will help the field of teacher education examine the influence of prior professional experience on case learning. Such investigations will be particularly important for those who wish to use cases in professional development programs.

Learning styles

The idea that people learn differently is venerable and probably had its origin with the ancient Greeks (Wratcher, Morrison, Riley & Scheirton, 1997). Educators have noticed that some students prefer certain methods of learning more than others. These dispositions, referred to as *learning styles*, form a student's unique learning preference and aid teachers in the planning of small-group and individualized instruction (Kemp, Morrison & Ross, 1998, p. 40; cited from

Diaz & Cartnal, 1999, p. 130). Grasha (1996) has defined learning styles as "personal qualities that influence a student's ability to acquire information, to interact with peers and the teacher, and otherwise participate in learning experiences" (p. 41).

Among the different learning style instruments, Kolb's learning style inventory has been widely applied in education field (Mainemelis, Boyatzis & Kolb, 2002). Kolb (1984) defined learning styles as relatively stable attributes preferences, or habitual strategies employed by learners to process information for solving problem. Serving both a practical and academic, Kolb developed the learning style inventory (LSI). The LSI is a tool designed to help individuals to better understand their styles of learning and allows for advances in the study of experiential learning (Kolb & Kolb, 2005). Studies by Kolb as well as other researcher support four different learning styles, that is the diverging style (the creator), the assimilating style (the planner), the converging style (the decision maker), and the accommodator style (the doer).

Diverging learning style
Individuals that rely on concrete senses to understand an experience from many views and transform it into knowledge are classified as having a diverging learning style (Kolb & Kolb, 2005). Individuals with this learning style have been named "creators' for their strength in imaginative abilities (Kolb, 1976a). This strength in independence and creativity in thought or action has been identified as a useful skill in generating new ideas such as brainstorming sessions. Hudson's (1966; Kolb, 1976a) research on this learning style established that individuals dominant in the diverging style are imaginative, emotional, and interested in people and cultures. Additionally, they are inclined to specialize in the arts.

Assimilating learning style
The assimilating learning style includes individuals who prefer to understand a situation from a theoretical or conceptual standpoint without consideration of any specific example related to it. Similar to the Diverging style, observation as opposed to action is preferred in the process of transforming experiences into knowledge (Kolb, 1976b). Individuals favoring this style have been nicknamed 'planners' due to their strength for creating theoretical models. Grochow's (1973) research on this learning type found a strength for creating an integrated explanation from dissimilar observations. Kolb suggests the 'planners' concern in creating theoretical models is more focused on logical soundness than practicality. Additionally, these learners tend to be interested in people in favor of abstract concepts (Kolb, 1976b, 2000).

Converging learning style
The converging learning style, like the assimilating style, includes individuals who prefer to understand a situation from the theoretical or conceptual standpoint without considering related examples. However, opposed to the assimilating style, action is preferred over observation in the process of transforming experience into knowledge. Individuals favoring this style have been given the nickname 'decision makers' for their strength in applying ideas in a practical way (Kolb, 2000). Hudson (1966) described learners favoring an abstract-active learning style as being relatively unemotional people preferring to deal with things rather than people.

Accommodating learning style
The accommodating learning style, like the diverging style, includes individuals who prefer to understand a situation from concrete senses. However, unlike the Diverging style, action is preferred over observation in the process of transforming experience into knowledge. These individuals have been given the nickname the 'doer' for their natural orientation towards carrying out plans and getting involved in experiences (Kolb, 2000).

METHOD

Participants

Thirty-seven pre-service teachers in the Elementary Education Program of Center for Teacher Education at National Dong-Hwa University in Taiwan participated in this study. This 2-year teacher preparation program leads to an elementary teaching credential. Twenty-seven pre-service teachers are female, and ten are male. Twenty-two participants have teaching experiences, and fifteen have no teaching experiences. Thirteen participants major in educational management, twenty-two participants major in early child education, one major in art and one major in music. There are nine pre-service teachers are diverging learning styles, eight are assimilating learning styles, thirteen are converging learning styles, and seven are accommodating learning styles. All participants took the course of Principles of Teaching which was taught by the researcher.

Case materials and discussion questions

In this study, cases are opportunities to practice decision making and problem solving. Case materials are used to help teachers "think like a teacher". In this conception, cases are not used explicitly to exemplify theory but rather to present situations from which theory emerges. This use of cases works well with the conception of teaching as a complex, messy, context-specific activity. The cases present problematic situations that require analysis, problem solving, decision making, and action definition. With such cases, students can, within the confines and safety of a teacher education classroom, "practice such professional skills as interpreting situations, framing problems, generating various solutions to the problems posed and choosing among them" (Sykes & Bird, 1992, p. 482; Merseth, 1996, p. 728).

The case of *A Lily in the valley* was presented to the pre-service teacher. It was about an urban teacher who taught in a rural area. A lot of things happened among teacher Lily, her students, parents, and residents in the valley. One year later, after she had been gradually used to the life in the valley, she struggled between going back to city to live with her mother or stay in the valley to continue teaching students there.

The case discussion questions before class as assignments included all the following questions:
  (1) What challenges does teacher Lily meet when she teaches in the rural area? How does she face these challenges?
  (2) Will you choose to stay in the rural area or back to the city to teach if you were teacher Lily? Why?
  (3) What general capacity a rural teacher should possess? Would you teach in the rural area if you have the opportunity? Why?

However, the second question which required analysis, problem solving, and decision making, discussed in class.

Instruments

This study implemented Kolb's learning style inventory (LSI) to assess pre-service teachers' learning style. The LSI consists of twelve incomplete sentences that describe some area of learning. Each sentence provides four answers which is representative for one of the four stages of the idealized learning cycle—Concrete Experience (CE), Abstract Conceptualization (AC), Reflective Observation (RO), and Active Experimentation (AE). Participants must give a rank '1, 2, 3, 4' to each answer. While '1' represents 'least like you' and '4' represents 'most like you'. For example, the LS1 presents the beginning of a statement such as 'When I learn' with four possible endings as follows. 1. 'I like to deal with my feelings'; 2.'I like to think about ideas'; 3.'I like to do things'; and 4. 'I like to watch and listen'. Individuals will assign each

ending, which describes one of the four learning styles, with a score of 4 to 1 representing (ie '4= most like you', '1=least like you') (Kolb & Kolb, 2005).

Completion of this process will provide learners with a numerical result which is associated with the learning style that best characterizes them. These combined scores plotted on Kolb's two dimensional model presents a learner's preferred learning style. To ensure that response bias is minimal, the items in the inventory have been mized so the responses for the 12 items, measuring the four learning abilities, have been placed in different columns from question to question.

The other component of the questionnaire was related to the respondent's demographic characteristics. This information was used to summarize the overall characteristics for the sample population and examined whether demographic characteristics have any relationship with preferred learning styles. This information was necessary for making statistical comparisons regarding personal characteristics of gender, year of study and academic specialization.

Data Analysis

The primary data source for this study was a set of case question answers which participants completed as part of the requirements for the course of Principles of Teaching. All the 37 participants were required to complete analyses of each of the assigned case question before and after class discussion. The assigned case question for the case is: Will you choose to stay in the rural area or back to the city to teach if you were teacher Lily? Why? All participants' pre- and post-answers were analyzed to explore pre-service teacher' thinking. The pre-service teachers' reasons for staying in the valley or go back to city were classified as 'resources', 'environment adaptation', 'filial piety', 'special feeling', and 'important others'.

In order to achieve the purpose of this research and test the hypothesis, SPSS was employed to analyze the data. Scores on the LSI were calculated in accordance with Kolb and Kolb (2005). Four scale scores (CE, RO, AC, AE), and two composite scores (AC-CE) and (AE-RO) were obtained for each subject. Chi-square tests are employed to test the statistical significance of the relationship between categories assembled in cross tabulation analysis and presented in the contingency tables. A Chi-Square score of less than .05 identifies a significant relationship between variables.

RESULTS AND DISCUSSION

There is difference between pre case discussion decision making and post case discussion decision making. However, two columns less than 5, more researches are needed for understanding the influence of case discussion on decision making.

Table 1
The Contingency Table for Pre decision making Crossed With Post Decision Making
Pre Decision Making

Post decision making	Leave	Stay	Chi-square
Leave	16	2	.000
Within Post	89%	11%	
Within Pre	89%	11%	
Stay	2	17	
Within Post	11%	89%	
Within Pre	11%	89%	

Table 1 compares pre-service teachers' decision making according to pre-post case discussion. As shown in the table 1, there is difference between pre case discussion decision making and post decision making. There are 16 v.s. 17 participants remain the same decision making. However, after case discussion, two participants changed their decision making from leave to stay. And two participants changed their decision making from stay to leave. Case discussion changed participants' decision making. However, two columns less than 5, more researches are needed for understanding the influence of case discussion on decision making.

There is difference between pre and post discussion for decision making perspectives. However, only two columns more than 5, more researches are needed for understanding the influence of case discussion on decision making reasons.

Table 2
The Contingency Table for Pre-discussion Reasons Crossed With Post-discussion Reasons for decision making

Post-discussion Perspective	Pre-discussion perspective				
	Resources	Environment	Filial Piety	Special Feeling	Important Others
Resources	2	2	1	0	1
Within Post	33%	33%	17%	0%	17%
Within Pre	29%	33%	8%	0%	33%
Environment	2	1	0	1	0
Within Post	50%	25%	0%	25%	0%
Within Pre	29%	17%	0%	11%	0%
Filial Piety	3	0	9	0	0
Within Post	25%	0%	75%	0%	0%
Within Pre	43%	0%	75%	0%	0%
Special Feeling	0	1	2	5	2
Within Post	0%	10%	20%	50%	20%
Within Pre	0%	17%	17%	56%	67%
Important Others	0	2	0	3	0
Within Post	0%	40%	0%	60%	0%
Within Pre	0%	33%	0%	33%	0%

Chi-square: .004

Table 2 compares pre-service teachers' decision making reasons according to pre-post case discussion. As shown in the table 2, there are 17 participants stay with the same perspectives, while there are 20 participants changed their perspectives for decision making. Case discussion changed participants' decision making perspectives. However, two columns more than 5, more researches are needed for understanding the influence of case discussion on decision making.

There is no difference between gender and change of decision making perspective. However, there are more female than male changed their decision making perspective after case discussion.

Table 3
The Contingency Table for Gender Crossed With Decision Making Perspective

Gender	Decision Making Perspective		Chi-square
	Change	No change	
Female	13	24	.091
Within gender	63%	37%	
Within decision making	85%	59%	
Male	7	10	
Within gender	30%	70%	
Within decision making	15%	41%	

Table 3 compares pre-service teachers' decision making perspective after case discussion according to gender. As shown in the table 1, there is no difference between gender and change of decision making perspective. However, there are 17 out of 27 female changed their decision making perspective after case discussion, while there are 3 out of 10 male changed their decision making perspective. In other words, 63% female changed while 30% male changed. And among the changed group, there 85% participants are female, while 15% are male. The result confirms that of Lundeberg and Fawver (1993). In some way, it might indicate that case method, a form of pedagogy developed for the graduate education of elite men at Harvard Business School can serve as a model for teacher education, which is traditionally dominated by middle class female. More researches are needed for understanding the influence of gender on case learning.

There is no difference between department and change of decision making perspective. However, there are more pre-service teachers from educational administration than that of early child changed their decision making perspective after case discussion.

Table 4
The Contingency Table for Department Crossed With Decision Making Perspective

Department	Decision Making		Chi-square
	Change	No change	
Educational Administration	10	3	.066
Within department	77%	23%	
Within decision making	50%	18%	
Early Child Education	8	14	
Within department	36%	64%	
Within decision making	40%	82%	
Music	1	0	
Within department	100%	0%	
Within decision making	3%	0%	
Arts	1	0	
Within department	100%	0%	
Within decision making	3%	0%	

Table 4 compares pre-service teachers' decision making perspective change after case discussion according to department. As shown in the table 2, there is no difference between department and change of decision making perspective. However, there are 10 out of 13 participants from educational administration changed their decision making perspective after case discussion, while there are 8 out of 22 participants from early child education changed their decision making perspective. In other words, 77% participants from educational administration changed, while 36% participants from early child education changed. And among the changed group, there are 50% participants from educational administration, while 40% from early child education. More researches are needed for understanding the influence of pre-service teachers' department on case learning.

There is no difference between teaching experience and change of decision making perspective.

Table 5
The Contingency Table for Teaching Experience Crossed With Decision Making

Teaching Experience	Decision Making		Chi-square
	Change	No change	
Yes	12	10	.603
Within experience	55%	45%	
Within decision making	60%	59%	
No	8	7	
Within experience	53%	47%	
Within decision making	40%	41%	

Table 5 compares pre-service teachers' decision making perspective change after case discussion according to their teaching experience. As shown in table 3, there is no difference between teaching experience and change of decision making perspective. The result contradicts to that of Levin (1993). More researches are needed for understanding the influence of prior professional experience on case learning.

There is no difference between learning style and change of decision making. However, there are less assimilating learning style pre-service teachers changed their decision making after case discussion.

Table 6
The Contingency Table for Learning style Crossed With Decision Making Perspective

Learning Style	Decision Making		Chi-square
	Change	No change	
Converging	8	5	.276
Within LS	62%	38%	
Within decision making	70%	29%	
Diverging	5	4	
Within LS	56%	44%	
Within decision making	25%	24%	
Assimilating	2	6	
Within LS	25%	75%	
Within decision making	10%	35%	
Accommodating	5	2	
Within LS	71%	29%	
Within decision making	25%	12%	

Table 6 compares pre-service teachers' decision making perspective change after case discussion according to their learning styles. As shown in the table 4, there is no difference between learning style and change of decision making perspective.

CONCLUSION

The results show that there is difference between pre case discussion decision making and post case discussion decision making and decision making perspectives. There is no difference in the influence of pre-service teachers' gender, teaching experience, and learning styles on case learning. That is, case method is effective for all preservice teachers, no matter what characteristics are they.

However, all learning styles except for assimilating learning style have more pre-service teachers changed than no changed. The assimilating learning style includes individuals who prefer to understand a situation from a theoretical or conceptual standpoint without consideration of any specific example related to it. Does it indicate that assimilating learning style pre-service teachers might have difficulty to learn from case method because they in favor of abstract concepts instead of real case? More researches are needed for understanding the influence of pre-service teachers' learning style on case learning.

References

Andersson, K., Hussenius, A. & Gustafsson, C. (2009). Gender theory as a tool for analyzing science teaching. *Teaching and teacher education, 25*, 336-343.

Bullough,J. R. (1997). Becoming a teacher: self and the social location of teacher education. In B. J. Biddleetal (eds.). International handbook of teachers and teaching, pp. 79-134. Netherlands: Kluwer academic publishers.

Boling, E. C. (2007). Linking technology, learning, and stories: implications from research on hypermedia video-cases. *Teaching and teacher education 23*, 189-200.

Diaz, D. P., & Cartnal, R. B. (1999). Students' learning styles in two classes: Online distance learning and equivalent on-campus. *College Teaching, 47(4)*, 130-135.

Gardner, H.（1983）. *Frames of mind: The theory of multiple intelligences*. New York: Basic Books.

Gardner, H. （1999）. *Intelligence reframed: Multiple intelligences for the 21st century*. New York: Basic Books.

Grasha, A. F. (1996). *Teaching with style- a practical guide to enhancing learning by understanding teaching and learning styles*. CA: Alliance Publishers.

Harrington, H. L. (1995). Fostering reasoned decisions: case-based pedagogy and the professional development of teachers. *Teaching & Teacher Education, 11(3)*, 203-214.

Hruska-Riechmann, S., & Grasha, A.F. (1982). The Grasha-Riechmann Student Learning Style Scales: Research findings and applications. In J. Keefe (Ed.), *Student learning styles and brain behavior.* VA: NASSP.

James and Gardner (1995).

Kleinfeld (1991). Changes in problem solving abilities of students taught through case methods. Paper presented at the annual meeting of the American Educational Research Association, Chicago.

Lazear, (1999).

Levin, B. B. (1993). Using the case method in teacher education: the role of discussion and experience in teachers' thinking about cases. Unpublished doctoral dissertation, University of California, Berkeley.

Liu, W. Y., & Teele S. (2009). A study on the intelligence profiles of Taiwan indigenous pupils—the case of second grade pupils. *Australian Journal of Indigenous Education, 38,* 83-93

Lundeberg, M. A. & Fawver, J. E. (1993). Cognitive growth in case analysis. Paper presented at the annual meeting of the American Educational Research Association, Atlanta.

Merseth, K. K. (1996). Cases and case methods in teacher education. In T. J. Buttery, E. Guyton, & J.P, Sikula (eds.), *Handbook of Research on Teacher Education, 2nd Ed*. (p,722-744). NY: MacMillan Publishers.

Merseth (1991). The early history of case-based instruction: insights for teacher education today.

Richardson, V. & Kile, S. (1992). The use of video cases in teacher education. Paper presented at the annual meeting of the American Educational Research Association, San Francisco.

Sykes, G. & Bird, T. (1992). Teacher education and the case idea. In G. Grant (Ed.), Review of research in education (Vol. 18, pp. 457-521). Washington, D. C.: American Educational Research Association.

Welty, W. M., Silverman, R., & Lyon S. (1991). Student outcomes from teaching with cases. Paper presented at the annual meeting of the American Educationl Research Association, Chicago.