Journal of Service Science and Management, 2014, 7, 201-210
Published Online June 2014 in SciRes. http://www.scirp.org/journal/jssm
http://dx.doi.org/10.4236/jssm.2014.73017

The Relationship among Teaching Beliefs, Student-Centred Teaching Concept and the Instructional Innovation

Mei-Hui Lin[1], Tsai-Fu Chuang[2*], Han-Pin Hsu[3]

[1]Department of Business Innovation and Development, MingDao University, Changhua, Taiwan
[2]Department of Design for Sustainable Environment, MingDao University, Changhua, Taiwan
[3]Ciaotou Elementary School, Yunlin, Taiwan
Email: [*]tfchuang@mdu.edu.tw

Received 31 January 2014; revised 28 February 2014; accepted 21 March 2014

Abstract

The objective of this study is to investigate the relationship among teachers' teaching beliefs, student-centred teaching concept and instructional innovation in Taiwan. The study was conducted with the participation of 538 teachers of elementary schools. A questionnaire of the "teaching beliefs and instructional innovation" designed by the authors was used as the data collection instruments. The descriptive statistics, Pearson product-moment correlation and multiple regression analysis were used in this study. Analysis results showed that: 1) There is a positive relationship between the teaching beliefs and the instructional innovation. 2) Teacher with a high degree of student-centred teaching concept would exhibit a higher level style of instructional innovation. 3) Multiple regression analysis can be used to infer causal relationships between the teachers' teaching beliefs and instructional innovation.

Keywords

Teaching Beliefs, Student-Centred Teaching Concept, Instructional Innovation

1. Introduction

Among all the countries, teaching is one of the most complicated jobs today. It requires broad knowledge of subject matter, curriculum, enthusiasm, and a love of learning, knowledge of discipline and classroom management techniques. Many studies showed the single most important factor determining the quality of the education

[*]Corresponding author.

How to cite this paper: Lin, M.-H., Chuang, T.-F. and Hsu, H.-P. (2014) The Relationship among Teaching Beliefs, Student-Centred Teaching Concept and the Instructional Innovation. *Journal of Service Science and Management*, **7**, 201-210.
http://dx.doi.org/10.4236/jssm.2014.73017

a child receives is the quality of his teacher. In order to improve the quality of teachers, many countries face a growing interest in the assessment of teachers [1]. Besides, it is generally assumed that only by becoming aware of their beliefs, teachers can further develop their repertoire [2]-[4]. Saroyan and Amundsen [5] even suggested that the most competent teachers conscientiously try to align their beliefs towards their actual teaching behavior with their behavior in an attempt to attain specific instructional goals.

In today's rapidly-changing world, "innovation" has become essential in our daily life. Bill Clinton, former president of the United States, has said "in the era of knowledge economy, we should use technology as our fuel and take innovation as our power". Since creativity is the fountainhead of innovation, the nurturing and promotion of creativity should be regarded as an important part of future education. For this reason, cultivating creative talents has become an important goal of education reform throughout the world. However, innovation can only be created through education that focuses on cultivating creativity for both teachers and students [6]. In January 2002, the Ministry of Education adopted "Republic of Creativity, ROC" as its vision and announced the "White Paper for Creative Education". The above publication positioned the role of creativity in education reform, devoting every effort to promote creative education, and pledging to use creative education as a key for future education reform. In order to equip students with creativity, teachers must adopt innovative and creative teaching methods [6].

It is generally believed that good teaching (the instructor side) comes with good learning (the student side). They are two sides of the same coin. Since teaching must help learners enhance their innovative abilities, "teaching innovation" is a crucial step to be taken. In general, the goal of teaching innovation is to increase students' knowledge, interest and wisdom, which means to impart knowledge in students who benefit from this knowledge, and cultivate a flexible, intelligent, and high-quality learning environment. Therefore, teaching innovation aims to provide students with valuable knowledge through an improved teaching process that betters the quality of students' learning and increases their motivation to learn [6].

In this study we try to investigate the relationship among teachers' teaching beliefs, student-centred teaching concepts and instructional innovation. The goals of this study were showed as follows:

1) Investigate the influence of teachers' teaching beliefs on the instructional innovation;
2) Investigate the relationship between student-centred teaching concepts and instructional innovation;
3) Investigate the causal relationships between the teachers' teaching beliefs and instructional innovation.

2. Literature Review

2.1. Teacher Beliefs and Teacher Behavior

Teacher beliefs have been studied to understand teaching practices [7] since beliefs influence behaviors [8]. Teacher beliefs are considered to be an indicator for certain students' behaviors because of the mediating effects of beliefs on the ways of teaching via their impact on decision making [7] [9] [10]. For example, teachers who believe that collaborative learning brings greater benefits than learning alone would tend to include more group work than teachers who see little or no learning value in collaboration. Moreover, teacher beliefs are regarded as one of the most valuable constructs for teacher education [7] [9].

Beliefs may guide teacher behavior either deliberately or spontaneously. In a deliberate way beliefs are retrieved or constructed with a lot of effort in a certain context and they are assumed to guide goal setting and behavior. In a spontaneous way beliefs are activated by routine [11]. Goals can be conceived of as long-range goals for student learning [12] and as short-term mental structures that arise in interaction with events in the classroom [13]. Fazio [14] also proposed that under conditions of high motivation and sufficient cognitive ability, people can put effort in building their beliefs related to certain goals and intentions. Without those two conditions beliefs related to a goal or intention are only routinely activated.

2.2. Instructional Innovation

Teaching innovation is an education model that aims to cultivate creative talents and realize the heuristic method of teaching. The main focuses of this method are to increase students' creativity and cultivate talents through creativity [6]. The methods of teaching must improve with the development of society. This implies using modern, interactive, and special methods/contents to replace rigid teaching models in the hope of cultivating students' innovative spirit and ability. In general, most traditional school education focuses overly much on written tests, memorization, rote learning and recitation while neglecting practical evaluation and extracurricular performance.

The result of overemphasizing written tests is that the process of learning has been overlooked, causing the suffocation of originality and creativity in the learning process [16].

Bruce [15] suggested that instructional innovation means to "learn" the interactive relationship between the "learners" and the "learning environment", and adopt information technology in teaching by using proper strategic skills, in the hope of generating better teaching efficacy. Wu [16] also suggested that instructional innovation meant teachers adopted diversified and lively teaching methods/contents in the teaching process, expecting to arouse students' interest in learning, cultivating their proactive learning attitude, and improving their learning abilities. Lin [17] proposed that instructional innovation indicated teachers must be open-minded and have the ability of introspection. Also, they should have the ability of reflection, questioning, deconstruction, and reconstruction, using these abilities to guide students on the right learning path and cultivating students' judgment and creativity.

Ghaith and Yaghi [18] suggested that teachers' willingness to implement new instructional practices to the traditional teaching activities is a key factor influencing educational improvement. Most school improvement efforts involve implementation of new practices. These practices may require only minor changes in certain teaching activities or may mandate an entirely new curriculum or a very different instructional approach. Moreover, several variables were identified in the literature as determinants of teachers' willingness to implement instructional innovations. These variables include the degree to which the innovations are aligned with teachers' present practices (congruence) and teachers' estimates of the needed extra time and effort to implement the innovations (cost) [19]. The identified variables also include teachers' perceptions of the importance and difficulty of implementing innovations [20], and teachers' experience and sense of efficacy [21]. Therefore, it is important to understand what factors influence teachers' attitudes toward the implementation of recommended practices.

2.3. Student-Centred Teaching

Student-centered teaching is an approach to education focusing on the needs of the students, rather than those of others involved in the educational process, such as teachers and administrators. This approach has many implications for the design of the curriculum, course content and interactivity of courses [22]. However, teacher-centred teaching has the teacher at its centre in an active role and students in a passive, receptive role. Besides, student-centred learning requires students to be active, responsible participants in their own learning [23].

Rogers [23] identified the important precondition for student-centred learning as the need for: "... a leader or person who is perceived as an authority figure in the situation, is sufficiently secure within herself (himself) and in her (his) relationship to others that she (he) experiences an essential trust in the capacity of others to think for themselves, to learn for themselves".

Choice in the area of the learning is emphasised by Burnard [24], as he interprets Rogers' ideas of student-centredness as "students might not only choose what to study, but how and why that topic might be an interesting one to study". He also emphasises Rogers' belief that students' perceptions of the world were important, that they were relevant and appropriate. This definition therefore emphasises the concept of students having "choice" in their learning. Kember [25] supports many other authors' views in relation to student-centred view including: that knowledge is constructed by students and that the lecturer is a facilitator of learning rather than a presenter of information.

3. Methods and Materials

3.1. Research Questions

This study was designed to address the following research question:

1) Do teachers in the research area have a high degree of student-centred teaching concept in their teaching beliefs?

2) Do teachers in the research area have a high level style of instructional innovation?

3) Is there a positive relationship between the teaching beliefs and the instructional innovation?

4) Would teacher with a high degree of student-centred teaching concept exhibit a higher level style of instructional innovation?

5) Can multiple regression analysis be used to infer the causal relationships between the teachers' teaching beliefs and instructional innovation?

3.2. Participants

The study was carried out with a total of 600 teachers from 35 elementary schools in Yunlin County of Taiwan (**Figure 1**). The participants were stratified sampling selected from different six educational areas of Yunlin County. The number of returned questionnaires is 562, the returned rate is 93.67%, invalid questionnaires are 24, effective questionnaires are 538, and the returned rate of effective questionnaires is 89.67%, respectively. Of all the elementary teachers participating in the study, 339 (63%) are female and 199 are male (37%).

3.3. Instruments

A questionnaire was designed by the authors based on the literature review and our considerations. In particular, the student-centred teaching concept was considered in the above questionnaire to collect necessary data for teaching beliefs and instructional innovation. The above questionnaire was then divided into two parts. The first part included 4 sets of factors and 22 fill-in items aimed to explore the teaching beliefs. The 4 sets of factors are teaching material, teaching method, teacher's role and teaching assessment. The items of questionnaire are rated on a five-point rating scale of Liker Type including "fits me extremely well" with "5", "fits me very well" with "4", "fits me moderately" with "3", "fits me slightly" with "2", "fits me not at all" with "1" point.

The second part included 4 sets of factors, and 24 fill-in items aimed to explore the instructional innovation. Again, the 4 sets of factors are teaching material, teaching method, teacher's role and teaching assessment. The items are rated on a five-point rating scale of Liker Type including "extremely agree" with "5", "very agree" with "4", "moderately agree" with "3", "disagree" with "2", "extremely disagree" with "1".

To ensure and enhance the reliability and validity of the questionnaire, Cronbach's Alpha coefficient, corrected item-total correlation and factor analysis available in SPSS are selected in this study.

Cronbach's alpha determines the internal consistency or average correlation of items in a survey instrument to gauge its reliability. Nunnaly [26] has proposed 0.7 to be an acceptable reliability coefficient but lower thresholds are sometimes used in the literature. The item-total correlation is a correlation between the question score and the overall assessment score. It is expected that if a participant gets a question correct they should, in general, he should have a higher overall assessment score than participants who get a question wrong. Also, it is generally accepted that the minimum value for this (item-total correlation) is 0.3.

Factor Analysis is a technique for finding a small number of underlying dimensions from among a large number of variables. This technique was used in this study to explore the possible underlying factor structure. By performing factor analysis, the underlying factor is identified, and data reduction can be achieved. There are generally two steps in factor analysis: namely, the extraction of factors and the rotation of the factors. Principal component analysis (PCA) and Varimax rotation available in SPSS was selected in this study. PCA is a widely used method for factor extraction. Factor weights are computed in order to extract the maximum possible

Figure 1. Location of research area. Source: http://fangshiushiu.wordpress.com.

variance, with successive factoring continuing until there is no further meaningful variance left. The factor model must then be rotated for analysis.

The Cronbach's Alpha coefficient was 0.92 for the first part of the questionnaire, and this implies a substantial degree of reliability. The coefficients of the item-total correlation also shows acceptable coefficients for all the 22 variables ($P < 0.05$), ranging from 0.40 to 0.70.

Table 1 showed the results of the factor analysis for the purpose of validity test. The results indicated that the questionnaire can explain 61.57% of the total variance for the data. Also, the eigenvalues of the 4 factors are also acceptable (should be higher than 1.00). To investigate whether the factor model is appropriate, Kaiser-Meyer-Olkin Measure and Barlett's Test of Sphericity available in SPSS is adopted in this study. The value of Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) is 0.89, and this value can be considered to be acceptable (should be 0.6 or above). Finally, the test of the Barlett's Test of Sphericity is also significant ($P = 0.000$, $P < 0.001$).

The Cronbach's Alpha coefficient was 0.97 for the second part of questionnaire, and this implies a substantial degree of reliability. The coefficients of the item-total correlation also shows acceptable coefficients for all the 24 variables ($P < 0.05$), ranging from 0.59 to 0.81.

Table 2 showed the results of the factor analysis for the purpose of validity test. The results indicated that the

Table 1. Rotated component matrix after varimax rotation (validity statistics) of the instrument of teaching beliefs.

No. of Items	Constructs (factors) **Factor 1** teaching material	Constructs (factors) **Factor 2** teaching method	Constructs (factors) **Factor 3** teacher's role	Constructs (factors) **Factor 4** assessment for learning
1	0.89			
2	0.89			
3	0.76			
4	0.55			
5		0.56		
6		0.50		
7		0.52		
8		0.81		
9		0.78		
10		0.52		
11		0.54		
12			0.48	
13			0.72	
14			0.52	
15			0.61	
16			0.74	
17			0.61	
18				0.50
19				0.81
20				0.48
21				0.72
22				0.42
Total eigenvalue	3.88	3.87	3.42	2.37
% of variance	17.65%	17.62%	15.55%	10.75%
Cumulative % of variance	17.65%	35.27%	50.82%	61.57%
KMO = 0.89				

Bartlett's Test of Sphericity: df = 231, Chi-Square = 1847.04, $P = 0.000$ ($P < 0.001$).

Table 2. Rotated component matrix after varimax rotation (validity statistics) of the instrument of teachers' instructional innovation.

No. of Items	Constructs (factors) Factor 1 assessment for learning	Constructs (factors) Factor 2 teacher's role	Constructs (factors) Factor 3 teaching material	Constructs (factors) Factor 4 teaching method
23				0.71
24				0.79
25				0.80
26				0.67
27				0.78
28				0.62
29			0.54	
30			0.67	
31			0.75	
32			0.71	
33		0.67		
34		0.54		
35		0.70		
36		0.80		
37		0.62		
38		0.76		
39		0.57		
40	0.60			
41	0.64			
42	0.70			
43	0.73			
44	0.71			
45	0.75			
46	0.79			
Total eigenvalue	5.651	4.50	4.19	3.32
% of variance	23.55%	18.74%	17.46%	13.81%
Cumulative % of variance	23.55%	42.29%	59.75%	73.56%
KMO = 0.94				

Bartlett's Test of Sphericity: df = 276, Chi-Square = 3164.80, $P = 0.000$ ($P < 0.001$).

questionnaire can explain 73.56% of the total variance for the collected data. Also, the eigenvalues of the 4 factors are also acceptable (should be higher than 1.00). To investigate whether the factor model is appropriate, again, Kaiser-Meyer-Olkin Measure and Barlett's Test of Sphericity available in SPSS is adopted in this study. The value of Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) is 0.94, and this value can be considered to be acceptable (should be 0.6 or above). Finally, the test of the Barlett's Test of Sphericity is also significant ($P = 0.000$, $P < 0.001$).

3.4. Data Analyses

The descriptive statistics, Pearson product-moment correlation and stepwise multiple regression analysis available in SPSS Statistical Package were selected in this study. The descriptive statistics is used to provide a general understanding of the collected data. Pearson product-moment correlation is adopted to investigate the relationship between teaching beliefs and instructional innovation. Finally, the stepwise multiple regression analysis is

employed to infer the causal relationships between the teachers' teaching beliefs and instructional innovation.

4. Results and Discussion

4.1. General Information

The results for the descriptive statistical analysis on the teaching beliefs of teachers were shown in **Table 3**. The mean, standard deviation (SD) and coefficient of variation (CV) for the four factors of teaching beliefs were calculated. The mean scores for the four factors of teaching beliefs were 4.47, 4.33, 4.30 and 3.79, respectively. The overall average for the four factors of the teaching beliefs is 4.27. As mentioned before, five-point rating scale of Liker Type was adopted in this study. The above results imply that the most frequently ratings filled in by teachers are 4 and 5. That is to say, "fits me extremely well" and "fits me very well" are most frequently selected by teachers. In other words, most teachers in the research area have a high degree of student-centred teaching concept in their teaching beliefs.

The coefficients of variation (CV) for the four factors of teaching beliefs were 0.11, 0.11, 0.11 and 0.14, respectively. This implies that the variances of the teaching beliefs filled in by teachers are very minor.

The results for the descriptive statistical analysis on the instructional innovation of teachers were shown in **Table 4**. The mean, standard deviation (SD) and coefficient of variation (CV) for the four factors of instructional innovation were calculated. The mean scores for the four factors of instructional innovation were 3.69, 4.02, 4.07 and 3.79, respectively. The overall average for the four factors of the instructional innovation is 3.98. The above results implied that the most frequently ratings filled in by teachers are 4. That is to say, "very agree" is most frequently selected by teachers. In other words, most teachers in the research area also have a high level style of instructional innovation. The coefficients of variation (CV) for the four factors of instructional innovation dimension were 0.17, 0.14, 0.13 and 0.17, respectively. This implies that the variances of the four instructional innovation dimensions filled in by teachers are very minor.

4.2. Relationship between Teachers' Teaching Beliefs and Instructional Innovation

The relationship between teachers' teaching beliefs and the instructional innovation was analyzed by Pearson product-moment correlation and multiple regression analysis. The correlation coefficients (r) between dependent variable (instructional innovation) and independent variables (teaching material, teaching method, teacher's role,

Table 3. Descriptive statistical data on the teaching beliefs of teachers.

Statistic	teaching material	teaching method	teacher's role	assessment for learning	aggregate of teaching beliefs
Mean	4.47	4.33	4.30	3.97	4.27
SD	0.47	0.47	0.48	0.55	0.43
CV	0.11	0.11	0.11	0.14	0.10
Minimum	2	2.43	2.50	2	2.48
Maximum	5	5	5	5	5

Table 4. Descriptive statistical data on the instructional innovation of teachers.

Statistic	teaching material of instructional innovation	teaching method of instructional innovation	teacher's role of instructional innovation	assessment for learning of instructional innovation	aggregate of instructional innovation
Mean	3.69	4.02	4.07	3.79	3.98
SD	0.61	0.56	0.51	0.66	0.52
CV	0.17	0.14	0.13	0.17	0.13
Minimum	1.33	2.00	2.29	1.29	2.07
Maximum	5	5	5	5	5

and assessment for learning) were 0.40, 0.51, 0.53 and 0.57, respectively (see **Table 5**). The above degree of correlation can be considered to be moderately correlated. Moreover, all the above correlation analysis is significant at the 0.01 level ($P < 0.01$). The above results suggested that teacher with a high degree of student-centred teaching concept would exhibit a high level style of instructional innovation.

The results of the multiple regression analysis were shown in **Table 6**. Three independent variables (teaching method, teacher's role, and assessment for learning) have been selected into the regression equation. **Table 6** showed that the value of R Square is 0.369 which implies that the regression equation can explain 36.90% of variance for the instructional innovation. The significance of the overall regression model is assessed by *F*-value statistics test. Higher *F*-values are associated with lower *P*-values. **Table 6** showed that the correlation is significant at the 0.001 level ($F(3, 537) = 103.877$, $P = 0.000$, $P < 0.001$).

Based on the aforementioned regression analysis, the following model can be postulated as a prediction tool.

Y (instructional innovation) = 0.182 * X_2 (teaching method) + 0.139 * X_3 (teacher's role) + 0.357 * X_4 (assessment for learning)

5. Conclusions and Recommendations

5.1. Conclusions

According to the above-mentioned analysis results, the following conclusions were drawn:

1) Teachers in the research area have a high degree of student-centred teaching concept in their teaching beliefs.

2) Teachers in the research area have a high level style of instructional innovation.

3) There is a positive relationship between the teaching beliefs and the instructional innovation.

4) Teacher with a high degree of student-centred teaching concept would exhibit a higher level style of instructional innovation.

5) Multiple regression analysis can be used to infer causal relationships between the teachers' teaching beliefs and instructional innovation.

5.2. Recommendations

The author proposes the following recommendations for schools and teachers who would like to engage in instructional innovation.

Table 5. Correlations between the instructional innovation and independent variables ($N = 538$).

Variables	Inter correlations					Mean	SD
	X_1	X_2	X_3	X_4	Y		
teaching material (X_1)	1	0.78**	0.69**	0.47**	0.40**	3.89	0.519
teaching method (X_2)		1	0.78**	0.61**	0.51**	4.47	0.47
teacher's role (X_3)			1	0.69**	0.53**	4.33	0.47
assessment for learning (X_4)				1	0.57**	4.30	0.48
instructional innovation (Y)					1	3.97	0.55

**Correlation is significant at the 0.01 level (2-tailed).

Table 6. Results of multiple regression analysis ($N = 538$).

Variables	Regression coefficients Standardized coefficients (Beta)	R^2	Adjusted R^2	Std. error of the estimate	*t*-value
assessment for learning (X_4)	0.357	0.319	0.318	0.43	7.42***
teaching method (X_2)	0.182	0.362	0.360	0.42	3.26**
teacher's role (X_3)	0.139	0.369	0.365	0.41	2.27*
$F(3, 537) = 103.877$***					

***Correlation is significant at the 0.001 level (2-tailed). **correlation is significant at the 0.01 level (2-tailed). *Correlation is significant at the 0.05 level (2-tailed).

1) Beliefs are the guidance of action. Teachers' beliefs influence their goals, teaching materials, patterns of classroom interaction, their roles, classroom practices, etc. Therefore, updating the teaching beliefs is the prerequisite of instructional innovation. Teachers have to update and renew their beliefs and adopt new teaching models to meet the demands of innovation.

2) The teaching beliefs are important factors to improve the instructional innovation. Therefore, the author suggested that the teaching beliefs should be included in the teacher education program.

Student-centred teaching implies that is a method of learning or teaching that puts the student at the center. To reinforced students' interests in learning interest and motivation, teachers have to create new teaching styles, broadening their thought parameters, and bringing knowledge, vividness, interests, and practicability into the classroom.

References

[1] Cochran-Smith, M. and Fries, M.K. (2001) Sticks, Stones, and Ideology: The Discourse of Reform in Teacher Education. *Educational Researcher*, **30**, 3-15. http://dx.doi.org/10.3102/0013189X030008003

[2] Borko, H. and Putnam, R.T. (1996) Learning to Teach. In: Berliner, D.C. and Calfee, R.C. (Eds.), *Handbook of Educational Psychology*, Macmillan, New York, 673-708.

[3] Cochran-Smith, M. and Lytle, S.L. (1999) Relationships of Knowledge and Practice: Teacher Learning in Communities. In: Iran-Nejad, A. and Pearson, C.D., Eds., *Review of Research in Education*, **24**, 249-305.

[4] Shulman, L.S. (1996) Paradigms and Research Programs in the Study of Teaching: A Contemporary Perspective. In: Wittrock, M.C., Ed., *Handbook of Research on Teaching*, 3rd Edition, Macmillan, New York, 3-36.

[5] Saroyan, A. and Amundsen, C. (2001) Evaluating University Teaching: Time to Take Stock. *Assessment and Evaluation in Higher Education*, **26**, 337-349. http://dx.doi.org/10.1080/02602930120063493

[6] Lee, Y. (2008) A Study of the Influence of Instructional Innovation on Learning Satisfaction and Study Achievement. *The Journal of Human Resource and Adult Learning*, **4**, 43-54.

[7] Pajares, M.F. (1992) Teachers' Beliefs and Educational Research: Cleaning Up a Messy Construct. *Review of Educational Research*, **62**, 307-332. http://dx.doi.org/10.3102/00346543062003307

[8] Ajzen, I. and Madden, T.J. (1986) Prediction of Goal-Directed Behavior: Attitudes, Intentions, and Perceived Behavioral Control. *Journal of Experimental Social Psychology*, **22**, 453-474. http://dx.doi.org/10.1016/0022-1031(86)90045-4

[9] Kagan, D.M. (1992) Implications of Research on Teacher Belief. *Educational Psychologist*, **27**, 65-90. http://dx.doi.org/10.1207/s15326985ep2701_6

[10] Kane, R., Sandretto, S. and Heath, C. (2002) Telling Half the Story: A Critical Review of Research on the Teaching Beliefs and Practices of University Academics. *Review of Educational Research*, **72**, 177-228. http://dx.doi.org/10.3102/00346543072002177

[11] Marieke, F., Stokking, K.M. and Verloop, N. (2008) Teacher Beliefs and Teacher Behaviour in Portfolio Assessment. *Teaching and Teacher Education*, **24**, 1691-1704. http://dx.doi.org/10.1016/j.tate.2008.02.021

[12] Clark, C.M. and Peterson, P.L. (1986) Teachers' Thought Processes. In: Wittrock, M.C., Ed., *Handbook of Research on Teaching*, 3rd Edition, Macmillan, New York, 255-296.

[13] Saxe, G.B. (1991) Culture and Cognitive Development: Studies in Mathematical Understandings. Lawrence Erlbaum, Hillsdale.

[14] Fazio, R.H. (1990) Multiple Processes by Which Attitudes Guide Behavior: The MODE Model as an Integrative Framework. In Zanna, M., Ed., *Advances in Experimental Social Psychology*, Academic Press, San Diego, 75-109.

[15] Bruce, R. (1989) Creativity and Instructional Technology: Great Potential Imperfectly Studied. *Contemporary Educational Psychology*, **14**, 241-256. http://dx.doi.org/10.1016/0361-476X(89)90013-1

[16] Wu, Q.S. (2002) The Essential Concepts and Implementing Strategies of Creative Teaching. *Taiwan Education Bimonthly*, **614**, 2-8. (in Chinese)

[17] Lin, Y.M. (2002) Creative Teaching-Start from the Professional Ethics. *Secondary Education Bimonthly*, **4**, 36-49. (in Chinese)

[18] Ghaith, G. and Yaghi, H. (1997) Relationships among Experience, Teacher Efficacy, and Attitudes toward the Implementation of Instructional Innovation. *Teaching and Teacher Education*, **13**, 451-458. http://dx.doi.org/10.1016/S0742-051X(96)00045-5

[19] Doyle, W. and Ponder, G. (1977) The Practicality Ethic and Teacher Decision-Making. *Interchange*, **8**, 1-12. http://dx.doi.org/10.1007/BF01189290

[20] Sparks, G.N. (1983) Synthesis of Research on Staff Development for Effective *Teaching. Educational Leadership*, **41**, 65-72. http://dx.doi.org/10.1016/0742-051X(88)90025-X

[21] Guskey, T.R. (1988) Teacher Efficacy, Self-Concept, and Attitudes toward the Implementation of Instructional Innovation. *Teaching and Teacher Education*, **4**, 63-69.

[22] Bender, B. (2003) Student-Centered Learning: A Personal Journal. *EDUCAUSE Center for Applied Research. Research Bulletin*, **2003**, 1-12.

[23] Rogers, C.R. (1983) The Politics of Education. In: *Freedom to Learn for the* 80's, Charles E. Merrill Publishing Company, Columbus.

[24] Burnard, P. (1999) Carl Rogers and Postmodernism: Challenged in Nursing and Health Sciences. *Nursing and Health Sciences*, **1**, 241-247. http://dx.doi.org/10.1046/j.1442-2018.1999.00031.x

[25] Kember, D. (1997) A Reconceptualisation of the Research into University Academics Conceptions of Teaching. *Learning and Instruction*, **7**, 255-275. http://dx.doi.org/10.1016/S0959-4752(96)00028-X

[26] Nunnally, J.C. (1978) Psychometric Theory. 2nd Edition, McGraw-Hill, New York.

Scientific Research Publishing (SCIRP) is one of the largest Open Access journal publishers. It is currently publishing more than 200 open access, online, peer-reviewed journals covering a wide range of academic disciplines. SCIRP serves the worldwide academic communities and contributes to the progress and application of science with its publication.

Other selected journals from SCIRP are listed as below. Submit your manuscript to us via either submit@scirp.org or Online Submission Portal.