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Psychology in Teacher Education: A Perspective from Singapore's Pre-Service Teachers

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This paper reports on Singaporean pre-service teachers' views of psychology and knowledge and the skills of psychology which are important for them. A total of 353 teachers taking the core module of educational psychology participated in the study. They rated the degree of appropriateness of items that described the discipline of psychology and responded to statements that described the sub-disciplines of psychology. They also rated the degree of importance of the items related to knowledge and skills for teachers. In general, the pre-service teachers of our study did not rate highly items related to knowledge. They rated moderately low general descriptions of the discipline of psychology. Three quarters to two thirds of them answered correctly descriptions related to counseling and general psychology, but possessed limited knowledge of the founders of psychology. The implications of the findings of our study for teaching of psychology and integrating psychology to teacher education are discussed.

Key Words: Singapore, pre-service teachers, knowledge, perception, psychology

Introduction

Psychology in Singapore's Teacher Education

Hume's (1879) article of the practical values of psychology to the teacher and Thorndike's (1910) advocate of the contribution of psychology to education seem to be challenged today. According to Hume, psychology has its values to the teacher in discovering the inter-relations of different lines of study (that is its interdisciplinary nature), in organizing and systematizing the teacher's mental life (that is through insightful reflection), and in guiding the process of bringing together the teacher and the learners. To him, psychology is a foundation of the mental sciences; is complementary to natural sciences; and is the introduction to the philosophical inquiries. Taking its stand as a science of intellects, character, and behaviour, psychology to Thorndike can contribute to education in three ways: clearer aims, understanding of human behaviour, and scientific methods. The positive views of psychology in education and for teachers elicited in the two articles of Hume (1879) and Thorndike (1910) set an inspiring tone for psychology to be accepted as part of teacher education.

Psychology in Singapore's teacher education was introduced in the early twentieth century, to the teachers as a subject or a component of a subject (Chang, 2002). The significant beginning of psychology in Singapore's teacher education granted the discipline an indispensable, but a yet fully recognized, academic status. Residing in a teacher educational institute, the department of psychology was first named as the Division of Psychological Studies (1991-1999) and later as the Psychological Studies Academic Group (since 2000). Organized under the education cluster of a teacher educational institute, the department's core business is to design programs and courses for the pre- and in-service teachers. Hence, all modules offered by this department are grouped under a category of "*educational studies*", and the

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contents of the modules are oriented in such a way that it is in line with the needs of schools of a fast changing Singaporean society. For the past one and a half decades, psychological models, theories and frameworks have been assimilated into professional programs such as the Diploma in School Advanced Diploma in Guidance and Counselling, Master in Arts (Applied Psychology) and Master in Education (Guidance and Counselling). Echoing the essence of "psychological studies", a term Koch (1993) struggled to recommend to replace the term "psychology", psychology modules in Singapore's teacher education do not reflect the expertise of "a single discipline but a collection of studies of varied cast" (p. 902). So too is the line-up of the faculty of this department. Faculty of the department comprise experts in academic and applied psychologies, counselling, social work and educational assessment. The modules are designed to include comprehensive, interdisciplinary but practical orientations relevant to classroom application and suitable for teachers.

On average, pre-service teachers enrolled into the diploma, postgraduate diploma or degree program in education attend two core modules in educational psychology; each lasting for about 24 or 36 hours. One of the modules focuses on learning and development. The other module highlights individual differences, instructional models, special education, and learning difficulties. Elective modules of educational studies run by colleagues of the Psychological Studies Academic Group are in areas such as assessment, counselling, motivation, thinking and creativity. The themes partly resemble those in the core educational psychology journals (1892-1992): cognitive strategies, attributional styles, active instruction, cognition and instruction (Mayer, 1992), educational initiatives and adaptive learning environments, and teacher expectations (Walberg & Haertel, 1992), but fail to include historical and practice-oriented themes such as historical perspectives of educational research and mathematics education, reading, and cognitive technologies (Walberg & Haertel, 1992).

Contents

Nearly all pre-service teachers are graduates of various disciplines (e.g., accounting, arts, business, education, engineering, and science). They rarely have wide knowledge of psychology. As a matter of fact, psychology in Singapore has a unique history of development. Until recently, psychology was not taught as a subject to non-psychology major graduates. Even if psychology had been a common subject, the vast expertise of psychology would have challenged Singapore's curricular designers to set clear criteria and direction to select contents relevant for the teachers. More than a century and half ago, James (1899/1958) predicted this concern. He noted that psychology describes "the elements of the mental machine … and their workings" (James, 1899/1958, p. 26) and warned teachers that they can "deduce definite programs and schemes and methods of instruction for immediate classroom uses" (p. 23). As "a guiding science of the school" (Cubberly, 1920, p. 755), psychology for teachers has to undertake "the vision of the scientific study of human behaviour in educational settings" (Wittrock, 1967, p.4). Pintrich (2000) suggests that psychology for teachers or educational psychology should "always maintain … goals of developing scientific and fundamental understandings of learning, development, cognition, and motivation." (p. 225).

The contents of psychology identified for the Singaporean pre-service teachers are also influenced by the faculties' specialities. For instance, the core module of educational psychology include themes as follows: attribution theory, self concept, self-esteem, self-regulation, self determination, creative thinking, critical thinking, problem solving, information-processing models, behavioural theories of learning, biological development (e.g., brain development and physical development), Piaget's theory of cognitive development, Vygotsky's zone of proximal development and constructivist views of learning, Bandura's social cognitive theory, Gardner's multiple intelligences, resilience, and basic counselling skills. The contents are delivered by faculty in two modes: case-based learning and lectures. Faculty is assigned to a group of 25-30 students. The group meets regularly over three months, for a total of 10 to 13 sessions. Each session lasts for 2-3 hours. Prior to the delivery, coordinators of the modules of educational psychology of the Diploma, Post-graduate Diploma and Degree programs meet during the curricular review exercises (once every one to two years) and collectively prepare materials and activities of learning. Course materials in the form of power-points are either up-loaded to the e-learning platform (i.e., blackboard) or distributed in the print form to the students. Assessments are in multiple modes. The pre-service teachers attend lectures. During tutorials they work in groups of four to six. Before the end of the semester, they present their group learning outcomes verbally, and submit a reflective essay of 2000-2500 words.

Research Questions

Our study examined pre-service teachers' perceptions of psychology and skills and the areas of psychological knowledge which they considered to be important to them. Four research questions guided our study: (1) What is the Singaporean pre-service teachers' perception of the discipline of psychology? (2) What is the pre-service teachers' knowledge of psychology? (3) What skills and knowledge of psychology do pre-service teachers regard as important? (4) Are there gender differences in pre-service teachers' ratings of important skills and knowledge and perception of psychology?

Method and Results

Research Question 1

The participants (N = 353, 81% = women, 89.3% aged between 20-29 years) rated the degree of appropriateness of the terms to describe the discipline of psychology on a 7-point scale, with anchors of 1: extremely inappropriate, to 7: extremely appropriate. "Moderately appropriate" was included between 3 and 5 to avoid ambiguous responses such as "I do not know". The Cronbach's Alpha for the items was .89. The participants also answered questions related to professional psychologists (true versus false), and those of the history of modern psychology (one correct answer from 4 options).

Mean, standard deviation and cluster analysis were computed. The hierarchical agglomerative method, i.e., the Ward method, yielded two distinct clusters (see e.g., Aldenderfer & Blashfield, 1984). The distance between the two clusters was 6.9. Participants 296 or 84.3% were grouped into cluster 2, and 55 or 15.7% into cluster 1 (with two missing values). From mean values and the findings of pair t-tests, we learned that the participants rated psychology highly with respect to its professional status (versus academic), practice (versus theory), social science (versus natural science), research (versus social service), science (versus culture), and faculty of arts (versus science) (see Table 1). Eighty four percent of the participants (C2, n = 296) had such perceptions (with final cluster centers 5 and above). From the 2-independent sample t-tests, female pre-service teachers rated "science" as an appropriate term to describe the discipline of psychology (M = 5.3, SD = 1.4) significantly lower than male graduates (M = 5.7, SD = 1.5, t = -2.2, p < .05).

Table 1. *Pre-service Teachers' Views of the Discipline of Psychology*

	M	*SD*	Rank	Pair t-test	Final cluster C1	Final cluster C2
Professional	5.8	1.2	1	16.7***	5	6
Academics	4.3	1.7	13		3	5
Experience	5.5	1.4	4	1.4	4	6
Experiment	5.4	1.4	7		4	6
Theory	5.1	1.4	9	-4.3***	4	5
Practice	5.5	1.5	4		3	6
Social science	5.5	1.4	4	8.7***	4	6
Natural science	4.6	1.7	10		3	5
Research	5.7	1.2	2	3.4**	4	6
Social service	5.4	1.4	7		4	6
Science	5.4	1.4	7	8.2***	4	6
Culture	4.5	1.6	11.5		3	5
Faculty of arts	4.5	1.7	11.5	2.5*	3	5
Faculty of science	4.2	1.7	14		2	5

* p < .01, ** p < .05, *** p < .001

Table 2. *Frequency of Correct Answers from the Pre-service Teachers*

	N	%
Counseling psychologists help people with mental problems to cope with and recover from their illness. (True, T)	259	73.4
Clinical psychologists help people deal with everyday problems that do not involve mental illness. (False, F)	147	41.6
Psychiatrists can prescribe medication. (T)	262	74.2
Psychologists are medical doctors with PhDs. (F)	251	71.1
Psychiatrists are awarded the Doctor of Psychology (PsyD). (F)	129	36.5
Psychiatrists are medical doctors with additional training in psychology. (T)	239	67.7
Educational psychologists counsel students with severe learning disabilities. (F)	90	25.5
School psychologists examine the effectiveness of a particular education policy (e.g., examination structure). (F)	105	29.7
When was modern psychology founded? (1879)	107	30.3
Who is the founder of modern psychology? (W. Wundt)	53	15
Who wrote the principles of psychology? (W. James)	47	13.3

Research Question 2

Frequencies for correct statements for professional psychologists, as well as general questions on the history of psychology, were computed (see Table 2).

Research Question 3

The participants rated the importance of knowledge and skills for teachers on a 7-point scale with anchors of 1: extremely unimportant and 7: extremely important. "Moderately important" was printed (placed between 3 and 5) to avoid ambiguous responses such as "I do not know" (see Tan & Lim, 2004, for partial analysis of the responses). The Cronbach's alpha for 67 items was .98. The hierarchical agglomerative method, i.e., Ward's method, yielded three distinct clusters (see Table 3, e.g., Aldenderfer & Blashfield, 1984). The distance between final cluster centers C1 and C2 was 9.13, C1 and C3 8.51, and C2 and C3 17.27. Participants 142 or 40.2% were grouped into C1, 66 or 18.7% into C2, and 145 or 41.1% into C3.

Research Question 4

On a 2-independent sample t-test, female pre-service teachers rated the following items statistically higher than their male counterparts at the $p < .05$ level: Enhancing language development in their students (#20, female: M = 6.07, SD = 1.07; male: M = 5.77, SD = 1.05, t = 2.05), measuring creativity in their students (#36, female: M = 5.66, SD = 1.21; male: M = 5.29, SD = 1.53, t = 2.16), and knowing psychological development of children or adolescents (#50, female: M = 5.89, SD = 1.16; male: M = 5.55, SD = 1.33, t = 2.13). On the same test, female pre-service teachers rated the item "leading the class effectively" (#31, M = 6.28, SD = .94) statistically higher than their male counterparts (M = 5.85, SD = 1.37, t = 3.06, $p < .01$).

Concluding Remarks

Perceived Discipline of Psychology

From the results of mean and cluster analysis, psychology was rated highly with terms such as "professional", "experience", "experiment", "practice", "social science", "research", "social service" and "science" (mean = 5 and above, cluster centers = 6). We infer the high ratings of the terms to the following reasons.

First, since its establishment, the Singapore Psychological Society's (SPS) leadership has been mainly undertaken by professional psychologists in the areas of clinical, organizational, and educational psychologies. Together with social service and medical professionals, the SPS has organized public education talks and psychological health seminars as well as developed health related social surveys. It

Table 3. *Pre-service Teachers' Ratings of Perceived Importance of Various Types of Knowledge and Skills for Teachers*

Items	*N*	K/S	*M*	*SD*	Rank	Cluster Centres		
						1	2	3
Making learning an enjoyable process for students (#35).	352	S	6.47	.90	1	7	5	7
Understanding attitudes of students (#3).	351	K	6.39	.89	2	6	5	7
Assessing students' learning (other than using the traditional school tests/exams) (#1).	349	S	6.35	.96	3	6	5	7
Making decisions effectively (#34).	352	S	6.30	.99	4	6	5	7
Maintaining discipline in the classroom (#33).	351	S	6.28	.95	5	6	5	7
Being creative in how to teach (#4).	351	S	6.26	.94	6.5	6	5	7
Encouraging helping behaviors/helpful attitudes in students (#19).	352	S	6.26	.96	6.5	6	5	7
Imparting moral values of students (#38).	350	S	6.24	1.06	8	6	5	7
Encouraging creative thinking in students (#18).	349	S	6.23	1.04	9	6	5	7
Leading the class effectively (#31).	352	S	6.20	1.04	10	6	5	7
Motivating students (#56).	352	S	6.17	1.13	11	6	5	7
Understanding cooperative, competitive and individualistic learning environments (#10).	350	K	6.03	1.04	12	6	5	7
Enhancing language development in students (#20).	352	S	6.01	1.07	13	6	5	7
Promoting critical thinking in students (#49).	352	S	5.98	1.11	14.5	6	5	7
Knowing effects of the family on the students (#21).	352	K	5.98	1.02	14.5	6	5	7
Ccounseling a student with serious problems (e.g., substance abuse / drug problems) (#11).	349	S	5.97	1.13	16	6	5	7
Delegating leadership responsibility to students (#13).	351	S	5.90	1.04	17	6	5	7
Fostering leadership skills in students (#22).	352	S	5.87	1.10	18	6	5	7
Understanding working effectively with the parents of students (#67).	352	K	5.86	1.19	19	6	4	7
Imparting social values of the community (#58).	350	S	5.85	1.27	20	6	4	7
Understanding effects of physiological impairments on learning (#17).	351	K	5.84	1.17	21.5	6	5	7
Using critical thinking in teaching methods (#64).	352	S	5.84	1.21	21.5	6	4	7
Knowing psychological development of children or adolescents (#50).	352	K	5.83	1.20	23	6	4	7
Understanding peer influence on students (#42).	352	K	5.82	1.19	24	6	4	6
Being able to change the attitudes of students (#8).	351	S	5.81	1.16	25	6	5	6

Table 3. *Continue*

Items	*N*	K/S	*M*	*SD*	Rank	Cluster Centres		
						1	2	3
Knowing physiological development of children or adolescents (#39).	351	K	5.79	1.16	26.5	6	5	7
Knowing components of critical thinking skills (#12).	351	K	5.79	1.07	26.5	6	5	6
Helping students remember and transfer knowledge and learning (#26).	351	S	5.76	1.17	28	6	4	7
Using problem-based learning techniques (students decide the questions to ask and how to learn) (#65).	352	S	5.72	1.21	29.5	6	4	6
Helping a student to deal with less serious psychological problems (e.g., test anxiety) (#25).	352	S	5.72	1.16	29.5	6	4	6
Knowing differences between compliance, conformity and obedience (#16).	350	K	5.70	1.25	31	6	4	7
Preventing and controlling aggressive behaviors (#47).	351	S	5.69	1.30	32	6	4	6
Understanding process of developing friendships (#48).	350	K	5.68	1.22	33	5	4	6
Understanding ways people function in groups (#66).	352	K	5.66	1.16	34	6	4	6
Knowing causal attributions of the students (how students explained their successes and failures) (#7).	351	K	5.65	1.18	35	6	4	6
Understanding boy-girl relationships among students (#5).	351	K	5.61	1.14	36	5	5	6
Knowing motivation theories (#40).	352	K	5.60	1.31	37	5	4	6
Measuring creativity in students (#36).	352	S	5.59	1.28	38	5	4	6
Understanding metacognition skills (how to think about thinking) (#37).	351	K	5.56	1.29	39	5	4	6
Teaching a multicultural/diverse student population (#60).	352	S	5.53	1.43	40	5	4	6
Conducting a study to test the effectiveness of their own teaching methods (#9).	351	S	5.51	1.30	41.5	5	4	6
Knowing theories on why students enjoy or do not enjoy learning (#63).	351	K	5.51	1.35	41.5	5	4	6
Referring a student to a professional psychologist/counselor for further help (#54).	352	S	5.50	1.28	43.5	5	4	6
Developing a good and effective test for students (#15).	351	S	5.50	1.35	43.5	5	4	6
Understanding language development (#30).	352	K	5.34	1.35	45	5	4	6
Knowing personality theories (#43).	351	K	5.33	1.40	46	5	4	6
Knowing learning theories (#32).	352	K	5.31	1.43	47	5	4	6
Knowing helping behaviors theories (#27).	351	K	5.24	1.35	48	5	4	6

Table 3. *Continue*

Items	*N*	K/S	*M*	*SD*	Rank	Cluster Centres		
						1	2	3
Enhancing self-concepts of students (#45).	351	S	5.23	1.44	49	5	4	6
Guiding a student in career issues (#24).	352	S	5.20	1.28	50	5	4	6
Knowing issues about prejudices and discrimination (#29).	352	K	5.09	1.39	51	5	4	6
Attending education conferences (#2).	351	K	4.97	1.27	52.5	5	4	6
Giving reasons for aggressive behaviors (#52).	352	K	4.97	1.44	52.5	5	3	6
Knowing theories on leadership (#62).	352	K	4.92	1.46	54	5	4	6
Providing reasons why people help or do not help (#53).	352	K	4.79	1.47	55	4	3	6
Knowing physiological components of the brain related to learning and memory (#44).	351	K	4.72	1.54	56	4	3	6
Knowing theoretical perspectives of psychology (#61).	352	K	4.69	1.52	57	4	3	6
Reading and understanding scientific papers published in psychology or education journals (#51).	352	K	4.59	1.55	58	4	3	6
Knowing functions of the parts of the brain (#23).	352	K	4.52	1.44	59	4	3	5
Knowing sources of power (theories) (#59).	352	K	4.45	1.62	60	4	3	6
Knowing scientific theories on intelligence (#57).	352	K	4.34	1.65	61	4	3	5
Designing a questionnaire for research (#14).	351	S	4.27	1.42	62	4	3	5
Knowing scientific method of conducting research (#55).	352	K	4.18	1.62	63	4	3	5
Calculating statistics to analyze research data (#6).	351	S	4.11	1.46	64	4	3	5
Knowing history of formal education (#28).	349	K	4.06	1.55	65	4	3	5
Presenting a paper at an education or a psychology conference (#46).	352	K/S	3.86	1.67	66	3	3	5
Naming parts of the brain (#41).	351	K	3.81	1.54	67	3	2	5

is not surprising to learn that psychologists in Singapore were perceived as professionals who provide social services and counseling (Tan & Lim, 2002).

Second, psychology in Singapore is an academic discipline in the fields of arts or social sciences. Started as the joint-department in 1986 with social work, the Department of Psychology at the National University of Singapore (NUS, 2005) offers its degrees in psychology in social sciences and arts. The new School of Humanities and Social Sciences of the Nanyang Technological University (NTU) gave birth to an independent, new division of psychology (2004). The Division of Psychology at NTU first enrolled students of various schools (e.g., engineering and business) to its minor program in psychology; and later in July 2005, to a full time bachelor degree program in arts specialized in psychology. The two departments of psychology offer a comprehensive list of modules: biological psychology, child psychology, adolescent psychology, organizational psychology, social psychology, positive psychology, cultural psychology, research methods, to name but just a few. They emphasize research,

experimentation, and culturally relevant contents.

Third, the establishment of the Division of Psychology at the NTU called for the repositioning of psychology in teacher education. A distinct mission and vision of the Psychological Studies Academic Group is yet to be outlined collectively. Since 2003, psychology in teacher education has employed a problem-based approach to teaching and learning. This innovative pedagogy aims to narrow the gap between teachers' perceived importance of applying what they learn in teacher education including from the psychological modules to practical classroom experiences with children of varying backgrounds and abilities.

Knowledge of Psychology

Our findings confirmed the unique patterns of the growth of psychology in Singapore's teacher education including the recent national initiative to deploy one counselor for each school. Almost three quarters of the participants were able to correctly answer questions related to counseling psychologists, while only a quarter were able to do so for questions related to educational or school psychologists. This observation is in line with the responses found in one of our studies, where the participants rated highly roles of psychologists in providing helping and social services (Tan & Lim, 2002). The participants did not show a high level of competence in answering general questions related to psychology. As the participants attend psychology under the setting of educational studies, they did not have ample opportunities to learn about the discipline of psychology.

Perceived Important Knowledge and Skills

In general, the pre-service teachers of our study rated higher items describing skills (S) than those describing knowledge (K). Nine out of ten of the first highest ranks (rank 1 to rank 10) belonged to the category of skills. Fifteen out of seventeen lowest ranked items (rank 51 to rank 67) belonged to the category of knowledge. Pre-service teachers taking part in this study gave moderate ratings to theoretical knowledge (e.g., # 32, #40 and #62) and research skills (e.g., #14, #46 and #55). Cluster analysis confirmed these observations. The majority of the pre-service teachers (C1 and C3, about 80%) perceived the importance of practical skills (with cluster centers of 6 and 7).

Our findings showed the contrary, that is, Singapore's pre-service teachers were less inclined to rate highly theoretical knowledge as well as research related skills and competence (*M* lower than 5).They affiliated less with theoretical orientations and scientific approaches to teaching and learning. Most pre-service teachers were contract teachers for a couple of months before they joined the teacher educational institute. We could attribute high ratings of items related to "skills" to the pre-service teachers' desired or practical experiences in the classroom.

Gender Difference

Like most of our studies on perceptions (e.g., see Tan & Lim, 2002), there were few significantly different findings between female and male participants. In this study, female pre-service teachers rated several items higher than their male counterparts on the importance of enhancing language development in students, measuring creativity in their students, knowing psychological development of children and adolescents, and leading the class effectively. They also rated significantly higher than their male counterparts on the appropriateness of describing psychology as a science. The present studies did not elicit factors that cause these differences. Future research should include various research methods such as interviews or open-ended questions to find out the reasons for such different views in terms of gender.

Limitations and Recommendations

The study was preliminary and exploratory. It investigated content knowledge included in the core module of educational psychology. Contents taught in elective modules of psychologically oriented modules were more in-depth. They deserve attention in future studies. The same study can be replicated by inviting psychology major students to find out if knowledge and ample exposure of psychology can alter the perceptions of a person of the discipline.

Psychology modules for pre-service teachers should help them develop contemporary psychological perspectives and up to date conceptualizations of teaching. The sub-discipline of educational psychology is not a foundation but one of the several resources (Doyle & Carter, 1996); other resources are such as developmental psychology, clinical psychology, counseling psychology, social psychology, cultural psychology, cognitive psychology, and instructional psychology. Due to its broad coverage, educational psychology should be taught as a core subject and an elective for at least two semesters (Snowman, 1997). What teachers need to learn from the educational psychology modules is to understand, value, and use the knowledge and processes involved (Hoy, 1996). As a

guide, the following six principles (Kiewra & Gubbels, 1997) can be useful to design curricula of psychology in teacher education: being driven by teaching models, integrating theory and practice, providing opportunities to practice teaching skills, presenting an integrated model for instructional planning, preparing teachers to teaching learning strategies, and helping students learn. Students use their experiences as a basis for thinking about reading, classroom activities, and long-term assignments, and for generating their own models of learning (Renninger, 1996). The multicultural and multiethnic features of today's classroom call for educational psychology modules to deal not only with issues of diversity and equity but also with content that reflects variations which may be a function of cultural differences (Marshall, 1996). It is important to notice that variations among teachers will affect the dynamics of a classroom (Rocklin, 1996).

Teacher educators and teachers should be reflective practitioners (Schon, 1983) and be in touch with the current literature of educational psychology and of other sub-disciplines. They should learn to be professional through conducting action research, reading term papers, attending conferences, organizing seminars and similar activities. Psychology in Singapore's teacher education will remain a phenomenon primarily of discussion but will not able to assist teachers to transform or to become professionals and scientists if it is only recognized as a knowledge pool to complement education, teaching and learning, and not as a foundation of mental science (Hume, 1897) or a guiding science of the school (Cubberly, 1920). Psychologists in teacher educational institutions shall persist in discovering coherence in psychology, education, and instruction (Burden, 2000) by designing curricula beyond epistemology but including ontology (Packer & Goicoechea, 2000). Teachers in the twenty first century should continue cultivating the positive spirit of psychology through investigative inquiries into phenomena such as "how do people learn? What make a good teacher? Do babies, children, and adults learn in the same way?" (Burden, 2000, p. 466)

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