Measuring the Level of Pedagogical Discontentment among Jordanian Science and Vocational Student Teachers

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ABSTRACT

The purpose of this study was to measure levels of pedagogical discontentment (PD) among science and vocational internship teachers at the Hashemite University in Jordan. A 38-item valid and reliable instrument named the Pedagogical Discontentment Questionnaire (PDQ) was used to collect data from a sample of 74 preservice teachers during the academic year 2005/2006. Results indicated that science and vocational preservice teachers expressed high levels of PD during their teaching experience, where vocational teachers demonstrated a higher level of PD compared with science teachers. Moreover, nonsignificant differences attributed to gender and GPA were found. Finally, reasons for that high level of PD were the lack of having sufficient pedagogical content knowledge, lack of well-established vocational curricula, and lack of support and encouragement from collaborative teachers and school administrators.

Introduction

In recent trends, the field of education has witnessed several calls for reforming science and vocational education and the whole process of teaching at schools (Tyack & Cuban, 1995). These two fields are considered extremely important in today's globalized society where science and vocations are the tools for economic, social, and environmental development (Altwasy, 2004). Related to educational reforms, for example, several documents were produced (i.e., *Project 2061: Science for All Americans* (AAAS, 1990), *The National Science*

Education Standards (NRC, 1996), and the *National Occupational Technology Standards* (NOTS, 1998) for the sake of reforming science and vocational teaching in the United States. Similarly, the same calls were observed in many other countries in the world; whereas, Jordan is one of these countries that has taken positive steps toward reforming its educational process since the mid eighties (Ministry Of Education, 1994).

Although the process of reforming science and vocational education, worldwide, started long time ago, most of these reform efforts failed in changing the traditional way of science and vocational teaching (Woodbury & Gess-Newsome, 2002). These authors attribute most of these failures in reform to the scant attention past reformers have given to teachers' thinking. Moreover, an argument was set by these authors that there has been a huge effort placed in precipitating educational change, but with little, resulting difference in classroom practices. This situation, however, has changed in recent years and currently the importance of addressing individual, personal aspects of teachers' thinking and beliefs are viewed as a cornerstone of the success of any reform effort (Battista, 1994; Bullough & Baughman, 1997; Clark, 2005; Clark & Peterson, 1986; Czerniak, Lumpe, & Haney, 1999; Pajares, 1997; Smith & Southerland, in review; Thompson, 1992).

Teachers' thinking is defined as teachers' knowledge and beliefs concerning teaching, teachers, learning, learners, schools, schooling, and subject matter. Teachers' thinking and practice is shaped by professional and life experiences, the nature and extent of teacher preparation, and continued professional learning (Ball, 2000; Fullan, 1991; Fullan & Hargreaves, 1996; Smith, 2005). Moreover, teachers' teaching is influenced by several personal and contextual factors (Gess-Newsome et al., 2003). Therefore, any prospective change or reform in teaching should "challenge the cultural traditions of schools" (Romberg & Price, 1983: 159).

Many researchers emphasize that changing education cannot be achieved without motivating teachers to be dissatisfied with their traditional teaching practices (Gess-Newsome et al., 2003; Gregoire, 2003). Woodbury & Gess-Newsome (2002), Sarason (1982), and Feldman (2000) suggest that if teachers are not dissatisfied with the curriculum they teach, they have little motivation to engage in idea of

reform and have little investment in making reform "work." Feldman (2000) argues that authentic transformation in education takes place when teachers "are *discontent* with their old practical theories and they find the new ones *sensible, beneficial, and enlightening*" (p. 613).

The concept of teacher's pedagogical discontentment (PD) can be defined as an *immediate* assessment of the teacher's *current* teaching practices (Sowell et al., in review). This concept, however, can be easily mixed with the concept of dissatisfaction. Evans (1997) discusses the problem associated with the definition of dissatisfaction. Traditionally, job dissatisfaction is known as an affective emotional reaction to a job that results from the mismatch between desired outcomes (Cranny et al., 1992). This ambiguity of defining job satisfaction results in methodological problems arising from conceptual haziness as Evans (1997) describes it:

> *Because there is lack of agreement over what is meant by job satisfaction, problems of construct validity potentially arise when researchers fail to provide a clear indication of what they mean by the term, or when they fail to clarify how research subjects interpret the concept (p. 321).*

However, Evans defines the concept of job satisfaction as "a state of mind determined by the extent to which individual perceives job-related needs to be being met" (p.328). Evans definition of job satisfaction gives a theoretical vein for further understanding of the concept of teachers' discontentment. Other researchers (Gess-Newsome et al., 2003) speak to the construct of teachers' discontentment. They define teachers' dissatisfaction as a promising precursor for teacher change. However, they indicate that the construct of dissatisfaction has two distinct dimensions: pedagogical (internal) that occurs when a teacher recognizes the mismatch between his/her teaching beliefs, instructional practices, goals and student learning outcomes; and contextual (external) that includes teachers' beliefs about different external aspects of their teaching (i.e., lack of administrative support, lack of supplies).

After distinguishing the concept of teachers' PD from Job satisfaction construct, the need of measuring that concept of teachers' level of PD appears to be essential. The present literature in education shows little research that measures teachers' level of PD. Only one study by

Sowell et al., (in review) began to measure teachers PD level. In conducting their study, they created an instrument that consisted of 38 items designed to help teachers show their level of discontentment with their pedagogical practices. This instrument was applied only to beginning American science teachers. However, no similar studies in Jordan could be found, demonstrating the need to unearth that concept and measure Jordanian science and vocational teachers' level of PD.

Statement of the Problem

Pedagogical Discontentment (PD) is a new concept to the area of education which can contribute significantly to improving the level of teachers' practices. Previous research has focused on teachers' job satisfaction while ignoring the importance of PD to teaching practices. To the best knowledge of the researchers, research in this area is limited internationally and locally. Specifically the problem of the study is: How preservice science and vocational teachers recognize and express a sense of discontentment with their existing teaching practices and goals?

Research Questions

The following research questions were formulated to guide this study.

1 - What is (are) the level(s) of pedagogical discontentment among Jordanian science and vocational teachers?

2 - Are there any significant differences in the levels of pedagogical discontentment of science and vocational student teachers that could be attributed to gender, grade point average (GPA) and field of teaching?

Importance of the Study

The field of preparing teachers has recently attracted lots of research efforts. This study is an investigation of the construct of pedagogical discontentment of science and vocational students' teachers. This study concerns predominately in finding any aspects of current practice/goals that preservice science and vocational teachers perceive to be ineffective.

Definition of Terms

Pedagogical Discontentment: Teacher's *immediate* assessment of his/her *current* teaching. It also means teacher's current experience of dissonance with regard to his/her science teaching goals and practices.

Science Education: Is the field that concerned with sharing science content and process with individuals not traditionally considered part of the scientific community (e.g. children, college students, or adults within the general public). Science Education comprises science content, some sociology, and some teaching pedagogy.

Vocational Education: Also called *Career and Technical Education* (CTE) is the science that prepares learners for careers that are based in manual or practical activities, traditionally non-academic and totally related to a specific trade, occupation or *vocation*, hence the term, in which the learner participates. It is sometimes referred to as *technical education*, as the learner directly develops expertise in a particular group of techniques or technology.

Methodology

Population and Sample

The population of the study included all the Hashemite University (HU) undergraduate preservice elementary teachers (N = 101), who participated in the university internship program during the academic year 2005/2006. All preservice elementary teachers at (HU) are required to teach all disciplines to elementary students (grade 1-4). However, for the purpose of this study, participants were surveyed to elicit their level of PD of teaching science and vocational education to their students. The total sample of the study included 94 students (40 science and 54 vocational). Twenty students were excluded from the actual sample for the purpose of participating in the pilot study. Moreover, seven students did not participate in the study. Therefore, the actual sample of the study included 74 "Science and Vocational Education" preservice elementary students. This sample size is considered acceptable and meeting the minimum required sample size in survey research (Hair et al., 1998).

Instrumentation

The instrument used to collect data in this study was a two-part

questionnaire named Pedagogical Discontentment Questionnaire (PDQ) adapted from Sowell et al., (in review) (see Appendix 1). The first part of the questionnaire collected demographic information related to students' gender, educational level, achievement level (GPA), and class type (science vs. vocational). The second part of the questionnaire included 38 items related to students' pedagogical discontentment (see Appendices 1 and 2). These items asked students to express their discontentment level on the various dimensions of their teaching activity (e.g. their discontentment on their teaching skills (e.g. item # 21, 2), knowledge (e.g. item # 12, 19), assessment (e.g. item # 24, 32) and classroom management (e.g. item # 1, 27). These items were rated on a Likert-type scale ranged as follow: 1 "No Discontentment", 2 "Slight Discontentment", 3 "Moderate Discontentment" 4 "Significant Discontentment", and 5 "Very high Discontentment". (see Appendix 2).

Validity and Reliability of the Instrument

The original English version of the PDQ was developed after an extensive review of the literature and consultation with field centers for teacher education (Sowell et al., in review). The PDQ was shown to have both content and face validity. For indication of reliability, the PDQ was studied with 74 students resulting in an acceptable reliability coefficient of 0.95.

Instrument Translation Process

To ensure equivalence of meaning of the items and constructs between the Arabic and English versions of the PDQ, a rigorous translation process was used that included forward and backward translation, subjective evaluations of the translated items, and pilot testing (Sperber, Devellis, & Boehlecke, 1994). The goal of the translation process was to produce an Arabic version of the PDQ with items that were equivalent in meaning to the original English version Two translators (faculty members) bilingual in English and Arabic translated the English version of the PDQ into Arabic (forward translation). These translators were instructed to retain both the form (language) and the meaning of the items as close to the original as possible but to give

priority to meaning equivalence. When the Arabic translation was finalized, the PDQ was then back-translated (from Arabic into English) by two other faculty members, bilingual in English and Arabic.

The back-translated items were then evaluated by a group of five faculties from the Hashemite University who did not participate in the backward and forward translation process to ensure that the item meanings were equivalent in both the original English version and the back-translated version. Moreover, this panel was also asked to ensure that the items of the instrument are culture free. If differences in meaning were found between items, those items were put through the forward and back-translation process again until the faculties were satisfied that there was substantial meaning equivalence. The Arabic version of the PDQ was then pilot tested with a group of 20 students and 10 faculties to collect feedback about instrument content and usage. The feedback from the students did not lead to any substantive changes. The feedback from the faculties emphasized that the items are culture free.

Instrument Standardization

The instrument was pilot tested with a group of 20 students, who taught either science or vocational education to elementary students. These students were excluded from the main sample of the study. Changes recommended by the validation panel and those identified as needed during the pilot test were incorporated into the instrument. These changes occurred only in the wording of items. The internal consistency of the instrument was estimated through the responses of the same group of students used in the pilot study. The 38-item instrument based on the pilot test yield a Cronbach's alpha of 0.92. This figure suggests that the instrument is suitable to measure students' levels of pedagogical discontentment.

Data Collection

During the last two weeks of the second semester of the academic year 2005-2006, the instrument was handed by the researchers to students in university internship program. Twelve percent of the respondents were males and 88% were females. This is a dominant female sample due to the nature of the teacher education program at the HU which encompasses mostly females. All respondents were in

their fourth year of study where there were 29 (39.2%) science student teachers and 45 (60.8%) vocational student teachers. Finally, 11% of Students' had an overall grade-point average between 3.5-4.0; 32% of students had a GPA between 3-3.49; 42% of students had a GPA between 2.5-2.99; and 15% of students had a GPA between 2-2.49.

Data Analysis

To answer the first research question, descriptive statistics were used to compute means and standard deviations for the overall scale of the PDQ instrument for the two groups of teachers. The SPSS statistical program was employed to carry out these analyses. The second research question was answered using independent t-tests and one-way analysis of variance (ANOVA). The t-test statistic was used to determine differences in students' levels of pedagogical discontentment based on gender and class type. In the case where the independent variables in the study had three or more levels (e.g., GPA), the ANOVA statistic was utilized. Alpha level was set at.05 a priori.

Results

An accuracy check of data entry was performed by inspecting the minimum and maximum values for each variable. Moreover, an examination of these values showed that no "out of range" values were entered. In addition, missing subjects were not detected either.

Results Pertaining to Research Question 1

Research question 1 inquires about the level(s) of pedagogical discontentment among Jordanian science and vocational student teachers. To answer this question, means and standard deviations were calculated for the overall scale to each group of teachers. Each of the 38 items; then the average of these means and standard deviations was found. Table 1 shows the mean and standard deviations of responses for science and vocational student teachers. As it appears in Table 1, the mean for overall level of pedagogical discontentment of science teachers (N = 29) was 1.96; whereas, the mean for overall level of pedagogical discontentment of vocational teachers (N = 45) was 2.81, indicating a higher level of pedagogical discontentment for vocational teachers.

Table 1: Means and Standard Deviations for Science and Vocational Student Teachers on Their Pedagogical Discontentment (PD)

Level of PD	N	Mean	Average std. Deviation
Science Student Teachers	29	1.96	1.01
Vocational Student Teachers	45	2.81	1.13

Results Pertaining to Research Question 2

Research question 2 asks about significant differences in levels of pedagogical discontentment of science and vocational student teachers that could be attributed to gender, grade-point average (GPA), and field of teaching. T-test was used to examine differences in the level of pedagogical discontentment based on gender and field of teaching whereas one-way analysis of variance (ANOVA) was utilized to examine differences in the level of pedagogical discontentment based on GPA. As shown in Table 2 significant differences in the level of pedagogical discontentment were not detected between both participants' based on gender.

Table 2: The t-test Results for Comparing Male and Female Student Teachers on Their Pedagogical Discontentment

	N	Mean	Std. Deviation	t	df	Sig. 2-tail
Male	9	2.5439	.43101	.376	72	.708
Female	65	2.4680	.58207			

However, Table 3 shows significant differences in the level of pedagogical discontentment based on field of teaching (science versus vocational). Table 3 indicates a significant difference between the participants' field of teaching and their level of pedagogical discontentment to the favor of science teachers since they had a lower mean value than that of vocational teachers.

Table 3: The t-test Results for Comparing Science and Vocational Student Teachers on Their Pedagogical Discontentment

	N	Mean	Std. Deviation	t	df	Sig. 2-tail
Science	29	1.9564	.48023	-8.615	72	.000
Vocational	45	2.8129	.29477			

That lower mean value that belong to science teachers means that science teachers were more content in their teaching than vocational teachers. Table 4 shows nonsignificant differences in the level of pedagogical discontentment based on grade-point average (GPA).

Table 4: The ANOVA Results for Comparing Levels of GPA on the Pedagogical Discontentment of Student Teachers

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.819	3	.273	.853	.470
Within Groups	22.396	70	.320		
Total	23.215	73			

Discussion and Implications

The primary purpose of this study was to determine levels of pedagogical discontentment among Jordanian science and vocational student teachers. Two groups of preservice teachers (science and vocational) participated in responding to 38 item pedagogical discontentment questionnaire (PDQ).

As displayed in the results' section, the only significant difference ($p = 0.003$, $\alpha < 0.01$) in the study appeared between the field of teaching (science versus vocational) the level of pedagogical discontentment. Vocational teachers demonstrated a higher level of discontentment with total mean value of 2.81; whereas, science teachers showed a lower level of discontentment with total mean value of 1.96.

The high level of pedagogical discontentment showed by vocational teachers could be attributed to various factors. Perhaps, the lack of having an established vocational education program at the University of this study is one of these factors. In contrast, science teachers have a

well established science education program that offers various courses in the pedagogy of science and other related courses that are viewed to support science teachers in their teaching.

Perhaps that low interest in vocational education is a reflection of that of all educational stakeholders, which appears in the schools' class schedule. The number of science classes largely exceeds that of vocational classes.

The low number of vocational classes in the schools' schedule forces vocational teachers to teach other disciplines for the sake of completing their teaching load. Therefore, vocational teachers feel discouraged from paying attention to develop their pedagogy of vocational education. On the other hand, science teachers enjoy more attention from all educational stakeholders to develop their pedagogy of science.

Another plausible source of the high level of pedagogical discontentment of vocational teachers is the low interest that both collaborative vocational teachers and their schools pay to vocational education. That low interest discouraged these preservice teachers from investing sufficient time and efforts in preparing to teach "the few vocational classes" that are already exist in the teaching schedule of the school.

Indeed, the low interest in vocational education is not only the case with participants in this study, but it is actually a nationwide concern. That low interest in vocations and vocational education could be attributed to what they call "the shame culture" in vocational education. The culture that negatively impacts the attitudes of the whole society toward vocations and vocational education (Altwasy, 2004). An investigative look at the Jordanian educational system showed that vocational education does not enjoy equal attention as other academic disciplines have. That low interest, however, maintains the already dominant attitudes of Jordanian youth toward studying other academic disciplines rather than developing their vocational education, an education that is severely required in Jordan in order to strengthen the country's economy and compete with the global market (Khasawneh et al., in review).

In discussing the necessity of reforming both science and vocational education in Jordan, the reasonable level of pedagogical discontentment that demonstrated by both groups of teachers, in this study, could

favorably contribute to achieving such a reform prospect. Few researchers (Gess-Newsome et al., 2003; Gregoire, 2003) emphasize the interconnectedness of pedagogical discontentment and reforming the whole process of teaching and learning.

Gregoire (2003) and Gess-Newsome et al., (2003) assert that the degree of pedagogical discontentment would result in greater receptivity/openness to professional development activities, which in turn help in reforming vocational and science education. Conversely, a low degree of pedagogical discontentment would be thought to likely result in an individual being less than receptive during such activities, thus provoking little or no real change as a result of those experiences.

In the same vein, Wheatley (2002) notes that some form of *disequilibrium*, *uncertainty*, or *dissonance* is required for true change and that these are caused by "a perturbation (i.e., a challenge to teachers' beliefs about their existing practices). The psychological need to resolve such disequilibrium often pulls teachers into learning and change" (p. 9). We agree wholeheartedly with this assertion and that the level of discontentment that both science and vocational teachers demonstrated in this study could be a precursor to reforming the whole process of pedagogy in both science and vocational education.

In summary, a detailed discussion was presented on how practicing teachers recognized and expressed points of pedagogical discontentment within their science and vocational teaching. It is important to note that although having a certain level of discontentment is essential to drive change in education, exceeding such a level would result in unfavorable results such as teachers' burnout (Haberman, 1991). Therefore, it is recommended that the college of education, at the university in this study, provides its prospective science and vocational teachers with the necessary pedagogical knowledge that would enhance their teaching capabilities in the future. One possible way to achieve this goal is by offering more courses in the pedagogy of science and vocational education to their prospective science and vocational teachers.

However, the ambitious reform in science and vocational education that we seek can't be achieved by only offering courses in pedagogy, additional factors should also be taken into consideration. An example of such factors is forecasting the sort of contextual discontentment that prospective teachers might face when they begin their teaching careers.

Another factor could be extending the internship period of prospective science and vocational teachers to more than one semester in order to allow them to conceptualize their own understandings of science and vocational education. This last step could be made more beneficial when increasing the communication between the prospective intern science and vocational teachers with their university supervisors, who can greatly help them develop their teaching careers and disseminate the reform mentality at schools.

قياس مستوى عدم القناعة التدريسية لدى طلاب التربية العملية في مساقي العلوم والتربية المهنية في الجامعة الهاشمية

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الجامعة الهاشمية - الأردن

الملخص

هدفت هذه الدراسة إلى قياس مستوى عدم القناعة التدريسية لدى طلاب التربية العملية في مساقي العلوم والتربية المهنية في الجامعة الهاشمية. وقد تكونت أداة الدراسة من ٣٨ فقرة أجاب عن أسئلتها ٧٤ طالباً وطالبة ممن شاركوا في برنامج التربية العملية للعام الدراسي ٢٠٠٥/٢٠٠٦م. وقد أشارت نتائج الدراسة إلى أن طلبة التربية العملية في مساقي العلوم والتربية المهنية عبروا عن درجة عالية من مستوى عدم القناعة التدريسية، إلا أن ذلك المستوى من عدم القناعة التدريسية كان الأعلى لدى طلبة مساق التربية المهنية. كما أشارت نتائج الدراسة إلى عدم وجود فروقات ذات دلالة إحصائية تعزى إلى الجنس والمعدل التراكمي بين أفراد عينة الدراسة. وأخيراً، توصلت نتائج الدراسة إلى أن النقص في المعرفة المتعلقة بطرائق التدريس، وعدم وجود برنامج متخصص في إعداد معلمي التربية المهنية، ونقص الدعم والتشجيع من مديري المدارس المتعاونة ومعلميها كانت من الأسباب الرئيسة لعدم القناعة التدريسية للطلبة المشاركين في الدراسة.

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Appendix 1
Pedagogical Discontentment Questionnaire
(English Version)

		No Discontentment	Slight Discontentment	Moderate Discontentment	Significant Discontentment	High Discontentment
1	Ability to lead successful inquiry-based activities/learning					
2	Teaching science to students of lower ability levels					
3	Monitoring student understanding through alternative forms of assessment					
4	Orchestrating a balance between the needs of both high and low ability-level students					
5	Preparing students to assume new roles as learners within inquiry-based learning					
6	Teaching science to both male and female students					
7	Using inquiry-based teaching within all content areas					
8	Assessing students' understandings from inquiry-based learning					
9	Assessing students' nature of science understandings					
10	Finding connections between science content and students' everyday lives					
11	Including all ability-levels during inquiry-based teaching and learning					
12	Teaching science to students from economically disadvantaged backgrounds					
13	Planning and using alternative methods of assessment					

Cont. Appendix 1
Pedagogical Discontentment Questionnaire
(English Version)

		No Discontentment	Slight Discontentment	Moderate Discontentment	Significant Discontentment	High Discontentment
14	Identifying students' prior science misconceptions					
15	Managing student behavior during inquiry-based activities					
16	Communicating outcomes of alternative assessments to administrators					
17	Translating personal science knowledge to levels appropriate for my students					
18	Having sufficient science content knowledge to generate lessons					
19	Teaching science to students of higher ability levels					
20	Teaching science subject matter that is unfamiliar to me					
21	Teaching science to students who previously have had less successful experiences in school science					
22	Integrating nature of science throughout the curriculum					
23	Using assessment practices to understand students' science learning					
24	Integrating science subject matter with other content areas					
25	Adapting science teaching strategies to reach ability levels of all students					
26	Having sufficient science content knowledge to facilitate classroom discussions					

Cont. Appendix 1
Pedagogical Discontentment Questionnaire
(English Version)

		No Discontentment	Slight Discontentment	Moderate Discontentment	Significant Discontentment	High Discontentment
27	Communicating outcomes of alternative assessments to parents					
28	Judging the appropriate amount of time spent on one particular topic					
29	Monitoring student understanding through traditional assessment practices					
30	Long term planning for science instruction					
31	Using assessment practices to modify science teaching					
32	Teaching science to a culturally diverse student population					
33	Developing strategies to teach nature of science					
34	Assessing students' understandings from laboratory/ hands-on learning					
35	Ability to plan successful inquiry-based activities/learning					
36	Balancing personal science teaching goals with state/national testing requirements					
37	Orchestrating a successful balance between covering a wide range of material and engendering deep student learning					
38	Balancing personal science teaching goals with those of national standards					

Appendix 2
Pedagogical Discontentment Questionnaire
For Science Teachers
(Arabic Version)

استبيان
رضا الطلبة المعلمين عن أدائهم التدريسي

تحية طيبة .. وبعد، ،

تهدف العبارات الواردة في هذا الاستبيان إلى تعرف درجة رضاك عن أدائك في تدريس مادة العلوم لطلبة المرحلة الأساسية الأولى. يرجى منك تحديد درجة رضاك عن تصورك لواقع ممارستك لكل عبارة من عبارات هذا الاستبيان من خلال اختيارك للإجابة المناسبة من وجهة نظرك مستخدماً المقياس التالي: (راضي، غير راض بشكل قليل، غير راض بشكل متوسط، غير راض بشكل عالي، غير راض بشكل عال جداً) علماً بأن الاجابات التي ستعطيها سوف تكون سرية ولن تستخدم لغير أغراض البحث.

شاكرا لك حسن تعاونك

الباحث

د. أحمد قبلان -قسم المناهج والتدريس

كلية العلوم التربوية- الجامعة الهاشمية

- معلومات عامة:

النوع: ( ) طالب

( ) طالبة

المستوى الدراسي: ( ) سنة أولى

( ) سنة ثانية

( ) سنة ثالثة

( ) سنة رابعة

( ) سنة خامسة

التقدير: ( )

الرقم	الفقرة	راضي	غير راض بشكل قليل	غير راض بشكل متوسط	غير راض بشكل عالي	غير راض بشكل عال جدا
١	أمتلك القدرة على قيادة نشاطات استقصائية تعليمية.					
٢	أمتلك مهارة تدريس العلوم إلى الطلبة ذوي المستويات الأكاديمية المتدنية.					
٣	أستطيع متابعة فهم الطلبة من خلال استخدام أنماط تقويمية متنوعة.					
٤	أحافظ على التوازن بين حاجات الطلبة ذوي المستويات المتدنية والعالية.					
٥	أهيء الطلبة للقيام بالنشاطات الاستقصائية العلمية المتعددة وكأنهم يقومون بها للمرة الأولى.					
٦	أستطيع تدريس العلوم للذكور والإناث.					
٧	استخدم أساليب التدريس الاستقصائي لتدريس كافة المحتوي العلمي.					
٨	أستطيع تقييم فهم الطلبة من خلال النشاطات الاستقصائية التعليمية.					
٩	أستطيع تقييم فهم الطلبة لطبيعة العلوم.					
١٠	أبحث عن روابط وعلاقات بين المحتوى العلمي الذي يتعلمه الطلبة وتطبيقاته اليومية.					
١١	أحرص على احتواء المستويات الأكاديمية المتباينة للطلبة خلال النشاطات الاستقصائية التعليمية.					
١٢	أستطيع تدريس العلوم إلى الطلبة ذوي المرجعيات الاقتصادية المتدنية.					
١٣	أخطط وأستخدام طرق مختلفة لتقييم الطلبة.					
١٤	أكشف عن المفاهيم العلمية الخاطئة لدى الطلبة.					
١٥	أربط بين ما يتعلمه الطلبة في مختبرالعلوم والغرفة الصفية.					

الرقم	الفقرة	راضي	غير راض بشكل قليل	غير راض بشكل متوسط	غير راض بشكل عالي	غير راض بشكل عال جدا
١٦	أمتلك مهارة إدارة سلوك الطلبة خلال النشاطات الاستقصائية التعليمية.					
١٧	أناقش نتائج تقييمات الطالب مع المسؤولين التربويين.					
١٨	أترجم المعرفة العلمية الشخصية بطريقة مناسبة للطلبة.					
١٩	أمتلك محتوى علمياً كافياً لتصميم دروس تعليمية.					
٢٠	أستطيع تدريس العلوم إلى الطلبة ذوي المستويات الأكاديمية العالية.					
٢١	أستطيع تدريس موضوعات علمية غير مألوفة لدي.					
٢٢	أستطيع تدريس العلوم إلى الطلبة ذوي التجارب غير الناجحة في تعلم العلوم.					
٢٤	أضمن طبيعة العلوم في المنهاج.					
٢٥	استخدم نشاطات تقييمية مختلفة لمعرفة فهم الطلبة للعلوم.					
٢٦	أضمن الموضوعات العلمية مع المحتويات الأكاديمية لمواد مختلفة (غيرالعلوم).					
٢٧	أكيف استراتيجيات تعليم العلوم المختلفة للوصول إلى كافة المستويات الأكاديمية للطلبة.					
٢٨	أمتلك محتوى كافياً من العلوم لتسهيل جلسات المناقشة الصفية.					
٢٩	أحرص على مناقشة مخرجات (نتائج) التقييم المختلفة مع الوالدين.					
٣٠	أقدر الوقت الكافي اللازم لتدريس موضوع معين في العلوم.					
٣١	أراقب فهم الطلبة المختلف من خلال نشاطات تقييمية تقليدية.					

الرقم	الفقرة	راضي	غير راض بشكل قليل	غير راض بشكل متوسط	غير راض بشكل عالي	غير راض بشكل عال جدا
٣٢	أستخدم منحى التخطيط بعيد المدى في تدريس العلوم.					
٣٤	أستخدم وسائل التقييم المختلفة من أجل تعديل أساليب تدريس العلوم.					
٣٥	أستطيع تدريس العلوم للطلبة ذوي الثقافات المختلفة.					
٣٦	أطور استراتيجيات لتدريس طبيعة العلوم.					
٣٧	أقيم فهم الطلبة من خلال التعليم في المختبر (النشاطات العملية).					
٣٨	أمتلك المقدرة على التخطيط لنشاطات استقصائية تعليمية ناجحة.					
٣٩	أحافظ على توازن ناجح بين تغطية محتوى علمي واسع مع مراعاة فهم الطلبة (من كلا الجنسين) العميق للمحتوى.					
٤٠	أوازن بين الأهداف الشخصية لتدريس العلوم مع الأهداف والمعايير الوطنية التي تحددها الوزارة لتدريس العلوم.					