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THE EFFECT OF CONCERN LEVELS ON PROFESSIONAL DEVELOPMENT OF TEACHERS

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Abstract
The study has investigated the effect of concern levels on professional development of teachers. The relational survey method was used about the concern levels of teachers of biology, chemistry, physics and science and technology. The data were collected through an questionnaire form developed by researcher. This questionnaire has included totally 43 items. Data collection tool was applied in four elementary schools and five high-schools with 45 teachers. Besides, an open-ended question was asked to them. Data were analysed using indepented t-test and ANNOVA suitable for the purpose. As a result, there is a significant difference between genders for 2, 3, 21, 27, 32 and 43. statements, branches for 7, 28 and 40. statements, experiences for 6, 8, and 37. statements and faculties for 10, 19, 31, 37, 39, 42 and 43. statements ($p<0,05$).

Key Words: Science Education, Concern Levels, Professional Development.

INTRODUCTION

Educational theorists have put forward the idea of development change in teachers' thinking (Berliner, 1988; Burden, 19982; Fuller, 1969; Katz, 1972). Fundamental to these theories is that teachers' ways of thinking change over time, with changes occurring in instructional behaviors, understanding of students and learning, awareness and understanding of context, and perceptions of self and teaching profession (Feiman-Nemser, 1983). The premise for this depiction of teacher development is based on "concerns theory" and can be attributed to work of Fuller (1969). Central to concerns theory is the idea that teachers identify and articulate the nature of their teaching concerns. Concerns, in this context, can be defined as perceived problems of teachers (Fuller, 1969), or things a teacher "thinks about frequently and would lke to do something about personally" (Reeves & Kazelskis, 1985, p.267).

Concerns can be defined as:
The questions with a more or less emotional undertone which signal insecurity and possible resistance against new situations and/or changes and which, one way or another, will have to solved by the teachers. Concerns, as expressed in questions and remarks, refer to a lack of competence perceived at this moment to responsibly perform the educational activities expected. In this way concerns are a natural phenomenon in situations in which teachers are expected to tackle novel problems, to use new materials or new methods, etc. (Van den Berg & Vanderberghe, 1995, p.20).

The concern-based adoption model discerns three main forms of concerns in the implementation of innovations: self-concerns, task-concern and other concern (Van den Berg & Vanderberghe, 1981). At the beginning of an innovation process many teachers especially wonder what the innovation will entail for them. This form of concerns is called self-concern. When self-concerns decrease, teachers start to wonder what the innovation will mean for their daily task performance. This attention for the effects on their tasks is called task-concern. Teachers orientating more to their pupils and colleagues are called other-concerned. Teachers who show other-concern will make an effort to concretize the innovation together with colleagues and pupils.

Within the three main forms of the concern-based adoption model we distinguish seven so-called stages of concern. These stages are defined as follows (Van den Berg et al., 1995, pp. 50-52).

- Becoming conscious (stage 0): the teacher shows little concern with the innovation has little or no interest for it and knows little about it.

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- Personal concern/information (stage 1): the teacher is interested in changes to occur in his or her own personal work situation, in the way in which he or she will have to prepare his or her daily work, ,n the time necessary to realize the innovation; the teacher wants to get the opportunity to study and/or discuss information about the innovation and wants to know how colleagues feel and do.
- Consequences for the pupils (stage 2): the teacher wants to make certain of the opportunities presented by the innovation with a group of pupils with whom he or she has some experience. He or she wants to have an indication of value of the innovation for those pupils.
- Restraint (stage 3): the attention is mainly aimed at the daily tasks and at realizing the innovation in practice as well as possible. The teacher is in the first place oriented to solving practical problems that occur regularly.
- Collaboration (stage 4): the concerns are in the first place aimed at collaboration with colleagues in view of a better implementation of the innovation; discussions and coordination with colleagues are regarded to be important.
- Revision on the basis of experiences with pupils (stage 5): the teacher is oriented to revision, i.e. change of the innovation as far as possible on the basis of pupils' reactions and on the basis of concrete results with pupils.
- Revision (stage 6): the teacher has more or less concrete changes in his mind to realize in practice, he or she sees clear alternatives to change the current innovation.

Stages 0, 1 and 2 refer to self-concern. Stage 3 relates to task-concern and stages 4 and 5 refer to other-concern. The stage of Revision (stage 6) is separate from the three main forms distinguished.

Self-concerns primarily deal with a teacher's feelings or adequacy and competence, and focus on worries such as "How am I doing?" "Will my students like me?". Task concerns deal with a teacher's preoccupation with a specific chore or duty, often focused on time or logistics, and relate to a teacher's assimilation of pedagogical knowledge. For example, "What music should I choose?" "What is the best way to teach a specific concept?". Other-concerns represent a shift in a teacher's focus toward student learning, including areas such as motivation, individual differences in learners, achievement and accomplishment of students. For example, "Is everyone learning in this class?" "How can learners' feelings of accomplishment be increased?". On the other hand, there are a lot of studies about perceived problems of beginning teachers, expectations of preservice teachers and their concerns with educational innovations in the literature (Viennam, 1984; Killen, 1993; Jongmans, 1998; Seferoğlu, 2001). To support and assist these studies, this study has been made to investigate effectiveness of concern levels on professional development of teachers.

METHOD

In this study, survey method was used. Within the scope of this method were studied teachers. The study was applied using questionnaire.

Universe and Sample

The universe of this study composed of whole secondary and high school teachers in Trabzon. The sample of this study consisted of 45 teachers from high schools and secondary schools in Trabzon during the 2009-2010 academic years. Features of participants are shown in the Table 1 below:
F: Female, M: Male, C: Chemistry, B: Biology, P: Physics, S: Science and Technology, T: Teachers' college, A: Faculty of Arts and Science

Table 1: Features of Participants

FEATURES	GENDER		SUBJECT DISCIPLINE				TEACHER EXPERIENCE LEVEL				GRADUATED FACULTY	
	F	M	P	C	B	S	1-5 years	6-10 years	11-20 years	Over 20 years	T	A
NUMBER of PARTICIPANTS	21	24	13	11	10	11	6	7	16	16	26	19

Data Collection Instruments

The main data collection tool was a questionnaire, which was applied to 45 teachers. The questionnaire was a structured five lickert scale including 43 statements which measures concern levels of teachers. To obtain validity, expert opinion was received. The reliability of questionnaire was found to be 0,89.

1 ⟶1-1.8 (Do not worried)
2 ⟶1.9-2.7 (Less concerned)
3 ⟶2.8-3.6 (A little worried)
4 ⟶ 3.7-4.5 (Worried)
5 ⟶ 4.6-5.4 (Very worried)

Data Analysis

In this study, data were obtained result of questionnaire. After application of questionnaire, concern levels were code from 1, 2, 3, 4 and 5, gender were code 1 and 2, branches were code 1, 2, 3, and 4, experiences were code 1, 2, 3, and 4, faculties were code 1 and 2. Then, to analyze of data, SPSS programme was used. Results of questionnaire were compared with independent t-test for gender and faculty, ANNOVA for subjects discipline and teacher experience level. Assessments have been interpreted with tables (Table 2, 3, 4, 5, 6).

FINDINGS

Teacher Concern Levels According to Gender

Obtained Findings from T-test According to Gender

Table 2: Paired sample T-test

	N		X	S	sd	t	P
To know when I am observed as I teach	45	F	2.48	1.030	39.355	2.272	0.028
		M	1.83	0.868		2.245	0.030
Managing my life efficiently	45	F	3.10	1.221	39.355	2.104	0.041
		M	2.33	1.204		2.102	0.042
Too many standards and regulations for teachers	45	F	3.14	1.014	42.935	2.289	0.027
		M	2.38	1.209		2.316	0.025
Planning according to students needs	45	F	2.05	1.024	38.619	-2.688	0.010
		M	2.79	0.833		-2.651	0.012
Not recognizing the social and emotional needs of students	45	F	2.95	0.865	42.130	-2.937	0.005
		M	3.71	0.859		-2.935	0.005
Asking question of my students	45	F	1.67	0.796	30.346	2.207	0.033
		M	1.25	0.442		2.129	0.042

According to results of T-test; there is a significant difference between genders for 2, 3, 21, 27, 32 and 43. statements. ($p<0.05$).

For second statement, female teachers have chosen mostly *"Less concerned"* and male teachers have chosen commonly *"Do not worried"*.

For third statement, female teachers have chosen mostly *"A little worried"* and male teachers have chosen commonly *"Less concerned"*.

For twenty-first statement, female teachers have chosen mostly *"A little worried"* and male teachers have chosen commonly *"Less concerned"*.

For twenty-seventh statement, female teachers have chosen mostly *"Less concerned"* and male teachers have chosen commonly *"Worried"*.

For thirty-second statement, female teachers have chosen mostly *"A little worried"* and male teachers have chosen commonly *"Worried"*.

For forty-third statement, both female and male teachers have chosen commonly *"Do not worried"*.

Teacher Concern Levels According to Subject Discipline
Obtained Findings From Anova According to Subject Discipline

Table 3: Anova Tukey test

		Sum of Squares	df	Mean Square	F	Sig
What is the principal may think if there is too much "noise" in my classroom	Between Groups	11.324	3	3.775	2.830	,050
	Within Groups	54.676	41	1.334		
	Total	66.000	44			
The absence of students which help science education	Between Groups	15.631	3	5.210	4.607	,007
	Within Groups	46.369	41	1.131		
	Total	62.000	44			
Not being flexible to meet the needs of different stduents	Between Groups	14.929	3	4.976	3.844	,016
	Within Groups	53.071	41	1.294		
	Total	68.000	44			

According to results of Anova-Tukey test; there is a significant difference between branches for 7, 28 and 40. statements ($p<0.05$).
For twenty-eighth statement, there is a significant difference between chemistry and biology teachers.
For fortieth statement, there are significant difference between chemistry and biology, chemistry and science-technology teachers.
If we compare concern levels according to 7, 28 and 40. statements;
For seventh statement, physics teachers have chosen commonly *"Less concerned"*, chemistry teachers have chosen *"A little worried"*, biology teachers have chosen *"Less concerned"* and science-technology teachers have chosen *"A little worried"*.
For twenty-eighth statement, physics teachers have chosen mostly *"A little worried"*, chemistry teachers have chosen *"Worried"*, biology teachers have chosen *"Less concerned"*, and science-technology teachers have chosen *"A little concerned"*.
For fortieth statement, physics teachers have chosen commonly *"A little concerned"*, chemistry teachers have chosen *"Worried"*, biology teacher have chosen *"Less concerned"* and science-technology teachers have chosen *"Less concerned"*.
These results show that chemistry teachers have much concern about assisted students who enrich to learn science and not to be relaxing meet to different students' needs. Using different approaches may not always a good way for each concepts. There are differences between subject disciplines according to teaching. For instance; biology is based on more verbal.

Teacher Concern Levels According to Teacher Experience Level
Obtained Findings From Anova According to Teacher Experience Level
According to results of Anova-Tukey test; there is a significant difference between experiences for 6, 8 and 37. statements ($p<0.05$).
For sixth statement, there is a significant difference between 6-10 years and 11-20 years, 6-10 years and over twenty years.
For eighth statement, there is significant difference between 11-20 years and over twenty years.
For thirty-seventh statement, there is a significant difference between 1-5 years and 11-20 years.

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Table 4: Anova Tukey Test

		Sum of Squares	df	Mean Square	F	Sig
Not making sure that students learn science concepts and skills by using a variety of approaches	Between Groups	12.655	3	4,218	3.879	,016
	Within Groups	44.589	41	1,088		
	Total	57.244	44			
Obtaining high achievement from my students	Between Groups	17.246	3	5.749	4.280	,010
	Within Groups	55.065	41	1.343		
	Total	72.311	44			
Having my inadequacies become known by administrators	Between Groups	12.538	3	4.179	3.158	,035
	Within Groups	54.262	41	1.323		
	Total	66.800	44			

These results show that there is a significant difference between experiences about *"Having my inadequacies become known by administrators"*, *"Could get a high success from my students"* and *"Using different approaches, not to be sure students learn science concepts and skills"*.

Teacher Concern Levels According to Graduated Faculty
Obtained Findings From T-test According to Graduated Faculty

Table 5: Paired Sample T-test

	N	X	S	sd	t	P
My ability to maintain the appropriate degree of class control	45	3.77 3.00	0.992 1.291	32.531	2.261 2.171	0.029 0.037
Not enough time for grading testing, assessments	45	3.27 2.47	0.962 1.020	37.558	2.672 2.647	0.011 0.012
Whether each student is reaching his or her maximum potential	45	3.58 2.84	1.065 0.958	41.067	2.383 2.424	0.022 0.020
Not making sure that students learn science concepts and skills by using a variety of approaches	45	3.69 2.74	0.970 1.147	34.880	3.021 2.942	0.004 0.006
Not motivating of my students	45	3.88 3.00	0.993 1.155	35.293	2.755 2.690	0.009 0.011
Not providing an opportunity to students for implementation of their learning	45	3.42 2.47	1.270 1.073	42.015	2.639 2.710	0.012 0.010
Asking question of my students	45	1.19 1.79	0.402 0.787	24.859	-3.328 -3.030	0.002 0.006

According to results of independent t-test; there is a significant difference between faculty for 10, 19, 31, 37, 39, 42, and 43. statements ($p<0.05$).

For tenth statement, teachers' colleges have chosen mostly *"Worried"* and faculties of arts and sciences have chosen commonly *"A little worried"*.

For nineteenth statement, teachers' colleges have chosen mostly *"A little worried"* and faculties of arts and sciences have chosen commonly *"Less concerned"*.

For thirty-first statement, both teachers' colleges and faculties of arts and sciences have chosen commonly *"A little worried"*.

For thirty-seventh statement, teachers' colleges have chosen mostly *"Worried"* and faculties of arts and sciences have chosen commonly *"Less concerned"*.

For thirty-ninth statement, teachers' colleges have chosen mostly *"Worried"* and faculties of arts and sciences have chosen commonly *"A little worried"*.

For forty-second statement, teachers' colleges have chosen mostly *"A little worried"* and faculties of arts and sciences have chosen commonly *"Less concerned"*.

For forty-third statement, both teachers' colleges and faculties of arts and sciences have chosen commonly "Do not worry".

Findings show that faculties of arts and sciences have less worried than teachers' colleges especially impact concerns. These results may be related to pedagogical knowledge of teachers.

The means of statements are shown in the Table 6 below:

Table 6: The Means of Statements

	N	Mean
STATEMENT	45	3.33
STATEMENT	45	2.13
STATEMENT	45	2.69
STATEMENT	45	2.62
STATEMENT	45	2.96
STATEMENT	45	2.93
STATEMENT	45	2.67
STATEMENT	45	2.76
STATEMENT	45	3.36
STATEMENT	45	3.44
STATEMENT	45	2.49
STATEMENT	45	3.16
STATEMENT	45	2.89
STATEMENT	45	2.49
STATEMENT	45	3.02
STATEMENT	45	2.82
STATEMENT	45	2.84
STATEMENT	45	2.58
STATEMENT	45	2.93
STATEMENT	45	3.24
STATEMENT	45	2.73
STATEMENT	45	2.80
STATEMENT	45	2.71
STATEMENT	45	3.11
STATEMENT	45	2.87
STATEMENT	45	2.56
STATEMENT	45	2.44
STATEMENT	45	3.00
STATEMENT	45	2.87
STATEMENT	45	2.98
STATEMENT	45	3.27
STATEMENT	45	3.36
STATEMENT	45	3.13
STATEMENT	45	3.22
STATEMENT	45	3.29
STATEMENT	45	3.09
STATEMENT	45	3.29
STATEMENT	45	3.13
STATEMENT	45	3.51
STATEMENT	45	3.00
STATEMENT	45	3.18
STATEMENT	45	3.02
43. STATEMENT	45	1.44

The highest concern level has been determined *"Unable to control the class"* and the least one has been determined *"Asking questions of students in class"*.

DISCUSSION AND CONCLUSION

These results show that male teachers are more inadequate than female teachers to meet the social and emotional needs. Female teachers have much concern about managing their life efficiently. It can be related to Turkish social structure. Expectations and efforts of male teachers which related to professional development is less and it is dependent on variety of individual reasons have been emphasized other studies. Caused it because of economic concerns as the male teachers out of class rather than taking the time to professional development through additional work to do is specify that they want to spend (Seferoğlu, 2001).

To provide effective science education teachers' colleges are authorized to highlight studies is taken into account in fact more of graduates of other faculties and in-service training to professional development requirements as it is possible to say (Keskil, 1999). This result, graduates of the teachers' colleges more than others to adopt what the training and professional development so that they may indicate a warmer look.

To answer the key question about the relation between teachers' professional development and their concern according to gender, subject discipline, teacher experience and graduated faculty. Results show that female teachers are more adequate than male teachers to meet the social and emotional needs of students. But female teachers have much concern about managing their life efficiently. Not only other jobs but also teaching requires too much effort. Elimination of disparities in the labor-cost will affect professional development positively. This result also can be related to Turkish social structure.

Another result from research is that chemistry teachers have much concern about assisted students who enrich to learn science and not to be relaxing meet to different students' needs. Generally there is a significant difference between chemistry and physics teachers.

According to obtained results from teacher experience, there is a significant difference between teacher experience about *"Having my inadequacies become known by administrators"*, "*Could get a high success from my students*" and "*Using different approaches, not to be sure students learn science concepts and skills*". To decrease significant difference, new teachers in the profession who can guide them in schools where teachers must begin to work. Teachers may discuss their problems and exchange ideas. Teachers can be informative about different approaches and techniques to each other. Teachers can advise each other of professional publications. Teachers can prepare teaching plan together and collaborate to share activities. Teachers can give each other moral support (Seferoğlu, 2001).

Pedagogical formation is necessary for to understand students' feelings and needs. Primarily for the development of a society of trained manpower is needed. Manpower is possible in good schools. Better training of students by teachers is dependent on the quality of education provided. Quality of education is dependent on development of teacher. It is not only individual but also related to in-service education program. Teachers should utilize from sources sufficiently.

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