

PERCEIVED PROFESSIONAL NEEDS OF MATHEMATICS TEACHER

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Abstract

Ongoing professional development programs are required by teachers in order to become more effective in teaching. Although, in-service courses are offered to enhance the teachers' professional skills but the courses are not relevant to their needs. This may be due to the administrators' assumptions of the teachers' needs rather than what the teachers actually need to be effective in their classes. This study's aim was to identify the perceived professional needs of mathematics teachers. A set of questionnaires of a Modified Mathematics Teacher Inventory of Needs were distributed to school teachers. The items in the questionnaires were divided into six categories, namely materials, new knowledge, methods of teaching, teaching marginal students, computer and calculator use and measurement. Descriptive statistics were employed in this study. Analysis of data revealed that the highest rated perceived needs were related to the remedial of low achieving students. The least preferred perceived needs were related to calculator usage, delivering mathematics instruction in English and selection of new textbooks. Finally, the study indicates that professional development programs should be relevant to teachers' needs and made available when requested.

Keywords: mathematics teacher, professional needs

1. Introduction

The concept of need has diverse interpretations. In the literature 'need' appears to be used interchangeably between a discrepancy, a recognized problem, the requirement for more services, and the wants of people (Stufflebeam et al. 1985; Packwood & Whitaker, 1988). The need to improve professionally is necessary for mathematics teachers in order to provide an adequate learning environment and preparing students for future lives in today's fast-paced world. Teachers also need to keep abreast with new knowledge and skills in order to be effective teachers. Most of the teachers relied on inservice programs for enhancing their skills. Many teachers expressed dissatisfaction about the usefulness of staff development program. The effort of the Ministry of Education to provide quality teacher training and inservice courses should be lauded (Kementerian Pendidikan Malaysia, 2001). According to Baird and Rowsy (1989), high quality inservice programs should be designed if teachers were to benefit from it. Inservice programs should be directed toward meeting the needs of teachers. Therefore, identification of these perceived needs is crucial for teachers. There is few literature concerning mathematics teachers' perceived needs. However, it must be noted that various departments of the Ministry of Education might have conducted needs studies, but were unavailaible to the reseacher. The resulting database should be useful in planning inservice program for mathematics teachers.

2. Purpose and Objectives

The purpose of this study was to identify specific professional needs of mathematics teachers. The objectives for the study were to:

1. identify and describe the most preferred perceived professional needs of mathematics teachers.
2. identify and describe the least preferred perceived professional needs of mathematics teachers.

3. Methods and Procedures

The sample for this study was sample of convenience from school teachers attending a mathematics education course at an institution (N=44). The teachers volunteered to be involved in the study. The survey of needs instrument used in this study was modified from Mathematics Teacher Inventory of Needs (Easterday & Smith, 1992) and Science Teacher Inventory Needs (Zurub & Rubba, 1983; Kamariah & Rohani, 1995). The instrument includes 33 items that were divided into six categories, namely (a) materials (b) new knowledge (c) methods of teaching (d) teaching marginal students (e) computer and calculator usage (f) measurement. Some of the items added were based on a consideration of studies of teacher needs. The teachers were asked to indicate the extend to which they needed assistance with particular issue by using one of four alternative responses: low need, moderate need, high need or very high need. The instrument also contained sections related to the demographic information. A panel of experts was asked to review the instrument for content and face validity. The instrument was administered during the last day of the course. The survey was given by this researcher and took approximately 20 minutes to complete. All teachers completed the survey. Statistical data were coded and analyzed using the Statistical Package for the Social Sciences (SPSS 11.0). Descriptive statistics (frequencies, means, and standard deviations) were used to analyze data.

4. Results and discussion

Table 1 Demographic summary

Variables	Categories	N	%
Age	21-30	11	25
	31-40	21	48
	41-50	12	27
Race	Malay	36	82
	Chinese	4	9
	India	4	9
Level of education	Non graduate	33	75
	Graduate	11	25
Teaching Experience	4-6 years	7	16
	7-9 years	18	41
	10 years and above	19	43

Table 1 contains a demographic summary of teachers who responded. The most prevalent age group of the respondents was 31-40 (48%), followed by the 41-50 (27%) age group and the 21-30 (25%) age group. All the respondents were female and 33 (75%) were non-graduate teachers and 11 (25%) were graduate teachers. In teaching experience, only 16% had less than 7 years compare to 41% of 7-9 years and 43% of 10 years and above of teaching experience.

Table 2 Alpha reliabilities coefficient of each factor

Scale	Alpha
Materials	0.73
Computer and calculator usage	0.68
Measurement	0.74
New Knowledge	0.74
Methods of teaching	0.93
Teaching marginal students	0.65

Table 2 shows the alpha reliabilities coefficient of each factor. The overall alpha reliability coefficient for the needs instrument was 0.95. The alpha reliability coefficient suggest that the scales have acceptable internal consistency.

Table 3 Ten Most Preferred Needs of Mathematics Teachers

Rank	Need	Mean	Std. Deviation
1	Provide remediation for low achievers (14)	3.73	.45
2	Update knowledge of mathematics-related career opportunities (3)	3.70	.55
3	Select an appropriate instructional strategies (7)	3.68	.47
4	Learning new methods of teaching mathematics (2)	3.68	.52
5	Methods of motivating students to learn mathematics (1)	3.65	.61
6	Update knowledge of applications of mathematics (5)	3.61	.58
7	Teaching students with learning problems (4)	3.60	.62
8	Delivery of mathematics concept to students (31)	3.57	.59
9	Prepare instructional and learning activities (29)	3.56	.67
10	Evaluating students' progress (22)	3.52	.66

Table 3 provides an analysis of the needs of teachers, as ranked by the basis of the mean. The top ten most preferred needs included: provide remediation for low achievers (3.73); update knowledge of mathematics-related career opportunities (3.70); select an appropriate instructional strategies (3.68); learning new methods of teaching mathematics (3.68); methods of motivating students to learn mathematics (3.65); update knowledge of applications of mathematics (3.61); teaching students with learning problems (3.60); delivery of mathematics concept to students (3.57); prepare instructional and learning activities (3.56) and evaluating students' progress (3.52). Most pressing needs were found in the new knowledge (items 2,3,5), methods of teaching (items 7,29, 31), teaching marginal students (items 1,4,14) and measurement (item 22) categories.

Table 4 Ten Least Preferred Needs of Mathematics Teachers

Rank	Need	Mean	Std. Deviation
24	Writing instructional objectives (23)	3.34	.89
25	Develop an instructional plan for a unit of mathematics (19)	3.27	.87
26	Developing computational skills (17)	3.27	.95
27	Update one's knowledge in instructional and learning theory (28)	3.26	.62
28	Inculcate noble values in mathematics instruction (24)	3.23	.81
29	Use scientific calculator in mathematics instructions (20)	3.16	.81
30	Employ individualized instructional strategies (8)	3.10	.66
31	Use graphic calculator in mathematics instructions (21)	3.02	.89
32	Delivering mathematics instructions in English (26)	2.95	.90
33	Selection of new textbooks (16)	2.93	.69

Table 4 provides an analysis of the needs of teachers, as ranked by the basis of the mean. In comparison to the most preferred needs for mathematics teachers (Table 3), the 10 least preferred needs included: selection of new textbooks (2.93); delivering mathematics instructions in English (2.95); use graphic calculator in mathematics instructions (3.02); employ individualized instructional strategies (3.10); use scientific calculator in mathematics instructions (3.16); inculcate noble values in mathematics instructions (3.23); update one's knowledge in instructional and learning theory (3.26); developing computational skills (3.27); develop an instructional plan for a unit of mathematics (3.27) and writing instructional objectives (3.34). Least pressing needs were found in the methods of teaching (items 17,19,23,24,26), computer and calculator usage (items 20,21), teaching marginal students (item 8), new knowledge (item 28) and materials (item 16) categories.

Based on the responses of these mathematics teachers, the teachers in this study expressed greatest need for remediation of low achievers. The 10 highest ranked needs, each to various degree, point to the teachers' desire to improve their teaching skills and knowledge. This may indicate that they were not acquiring relevant skills and knowledge in their current inservice program. The high rankings of the remediation of low achievers was expected since many teachers had not been trained on how to teach and accommodate to the low achievers' needs and problems. Evidence indicate that teachers are willing to learn new method of teaching. This also showed that teachers really cared about their students performance and looked at ways on how to improve student performance. The low ranking of writing instructional objectives was expected since most of the teachers were experienced teachers. The low ranking of needs regarding delivering mathematics instructions in English and calculator usage might indicate that the needs were being addressed.

5. Conclusion

The results of these study demonstrated the perceived needs of mathematics teachers in schools. The findings from this study could have implications to mathematics teachers. When planning inservice courses or programs, consideration should be given to areas of most pressing needs prior to the inservice program. We should be sensitive to different needs of the teachers. Providing the same program for all teachers may not meet the needs of all teachers. The findings of this study also provide directions for further research related to the perceived needs of mathematics teachers and the extent to which the current inservice courses are adequate to the needs of the teachers. Further research, should also look into teacher variables such as age, experience and level of education.

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