

CHAPTER IV

Results of the Study

Introduction

This section describes the results of the study that were collected from a random sample of 30 Sixth Form Geography teachers and it is divided into the following subsections:

- (1) Teachers' SoC about the Curriculum Innovation, and
- (2) Teachers' LoU about the Curriculum Innovation.

Teachers' SoC about the Curriculum Innovation

The results of the analysis of data on teachers' SoC and interpretations made are organized as follows: Descriptive statistics using percentile scores to indicate SoC for (a) the sample as a whole, and (b) the various teacher groups categorised in terms of the demographic variables of gender, teaching experience and the location of the school.

Aggregate teacher concerns at the different stages can be compared using raw scores. To compare intensities of concerns, it is necessary to convert the scores to percentiles. Percentiles conversions are based on the responses of a carefully selected, stratified sample of 646 individuals who participated in the early concerns studied at the University of Texas. The SoC raw score-percentile conversion chart is shown in Appendix G.

SoC for the sample

The percentile scores of the total sample for the seven SoC were examined in terms of their means (M) and standard deviations (SD). The mean percentile scores, the standard deviations and the intensity (I) of the total sample for the seven SoC are presented in Table 8.

As shown in Table 8, the teachers' concern intensity are high in Stage 0 (Awareness concern), Stage 1 (Informational concern), Stage 2 (Personal concern), Stage 3 (Management concern) and Stage 6 (Refocusing concern). These five SoC depict mean percentile score of 70 and above.

Table 8. Means, Standard Deviations and Intensity of SoC Percentile Scores for the Total Sample of Teachers

Stages of Concern	<u>M</u>	<u>SD</u>	I
0	70.27	21.93	High
1	75.33	13.83	High
2	77.53	19.57	High
3	70.17	23.16	High
4	53.53	21.56	Moderate
5	67.07	21.60	Moderate
6	75.03	20.97	High

Stage 0 has a mean score of 70.27. This high score reflects awareness of and concern about the innovation. The next stage with a high mean score of 75.33 for the total sample is Stage 1 (Informational) which indicates intense

concerns about what the innovation entails. The teachers are interested in having more descriptive information about the innovation.

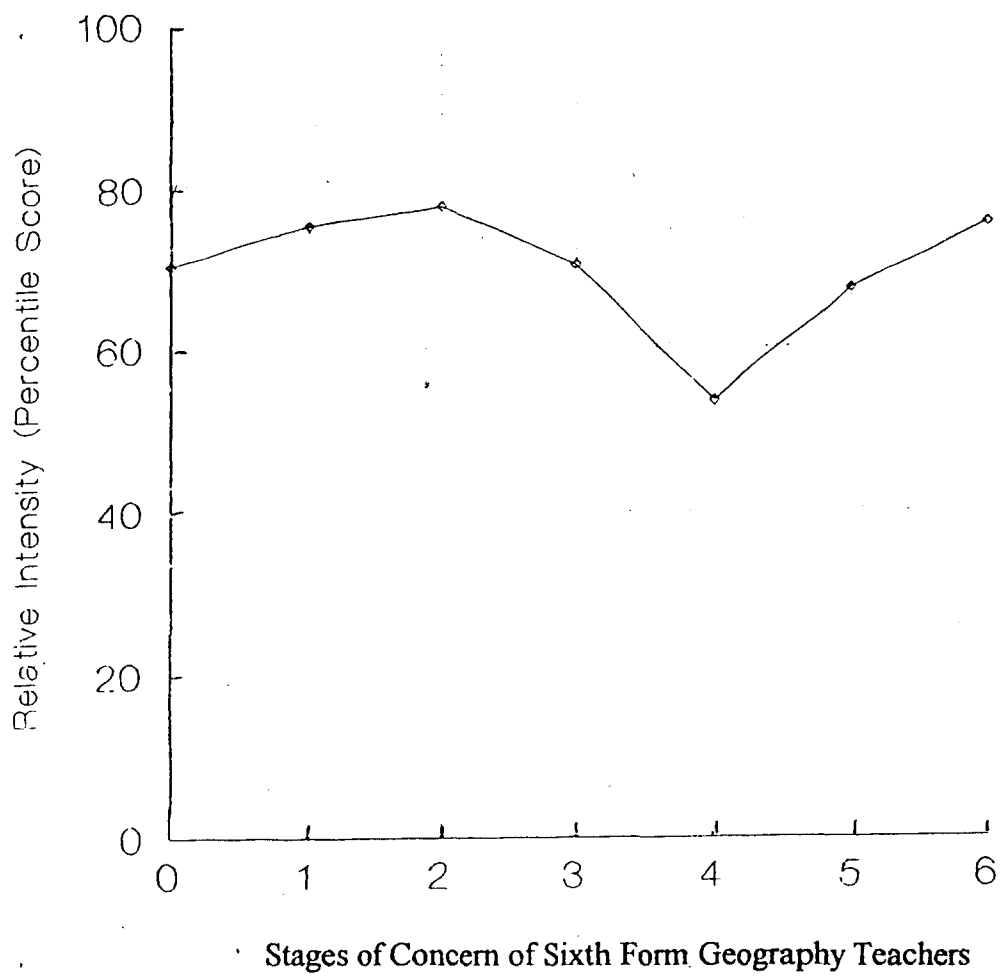
A high Stage 2 score indicates intense concerns about ego-oriented questions and uncertainties about the innovation. Anxiety about status, reward and potential or real effects of the innovation are of high concern to the teachers. These concerns reflect uneasiness regarding the innovation. The high Stage 3 (Management) mean score of 70.17 indicates that the management concern of the teachers is increasing in intensity as they begin to use the innovation.

The final high stage of concern is Stage 6 (Refocusing) which indicates that the teachers are exploring the possibility of changes or replacement to supplement the existing innovation. It shows that the teachers are developing some ideas and alternatives to the existing innovation for a greater impact. Lower means registered for Stages 4 (Consequence) and 5 (Collaboration) are indicative of beginner users of the innovation.

Figure 4 shows the group profile of the whole sample. The profile already indicates that the teachers have high stages 0, 1, 2, 3 and 6 concerns and moderate concern for Stages 4 and 5. This profile resembles both that of a non-user (high Stages 0, 1 and 2) and a beginner user (high Stage 3).

Considering that all these teachers have already begun the use of the innovation since 1996, it seems unusual that their Stages 0 to 2 concerns are still intense at this point of the implementation process. Since they are already using the innovation, the only conclusion that can be inferred is that these

Figure 4. Group Profile of SoC of Teacher Sample



teachers still have 'self' concerns (Stages 0 to 2) which have not been totally resolved. This scenario is detrimental since unresolved 'self' concerns can be an obstacle to implementation (Hall & Rutherford, 1976). This may also explain the moderately high Stage 5 concern since all these teachers may feel the need to get together to exchange ideas and share resources regarding the use of the innovation. The high Stage 6 concern comes as no surprise as it might result from the unresolved 'self' concerns. This might prompt the teachers to develop their own ideas and alternatives to the existing form of the innovation which they are using.

SoC and Gender

Table 9 presents the mean percentile scores (M), the standard deviations (SD) and the intensity (I) of the SoC for Sixth Form Geography teachers grouped according to their gender. As shown in Table 9, the male teachers' concern intensity are high in Stage 0 (Awareness concern), Stage 1 (Informational concern), Stage 2 (Personal concern), Stage 3 (Management concern), Stage 5 (Collaboration) and Stage 6 (Refocusing concern). These six SoC depict mean percentile score of 70 and above.

The moderate intensity score is at Stage 4 (Consequence) with mean of 62.10 and standard deviations of 19.15. This score denotes impact concern which is relatively lower than 'self' concerns (Stages 0 to 2) and the management concern (Stage 3). The male teachers seem to have lesser concern on impact of the innovation on their students.

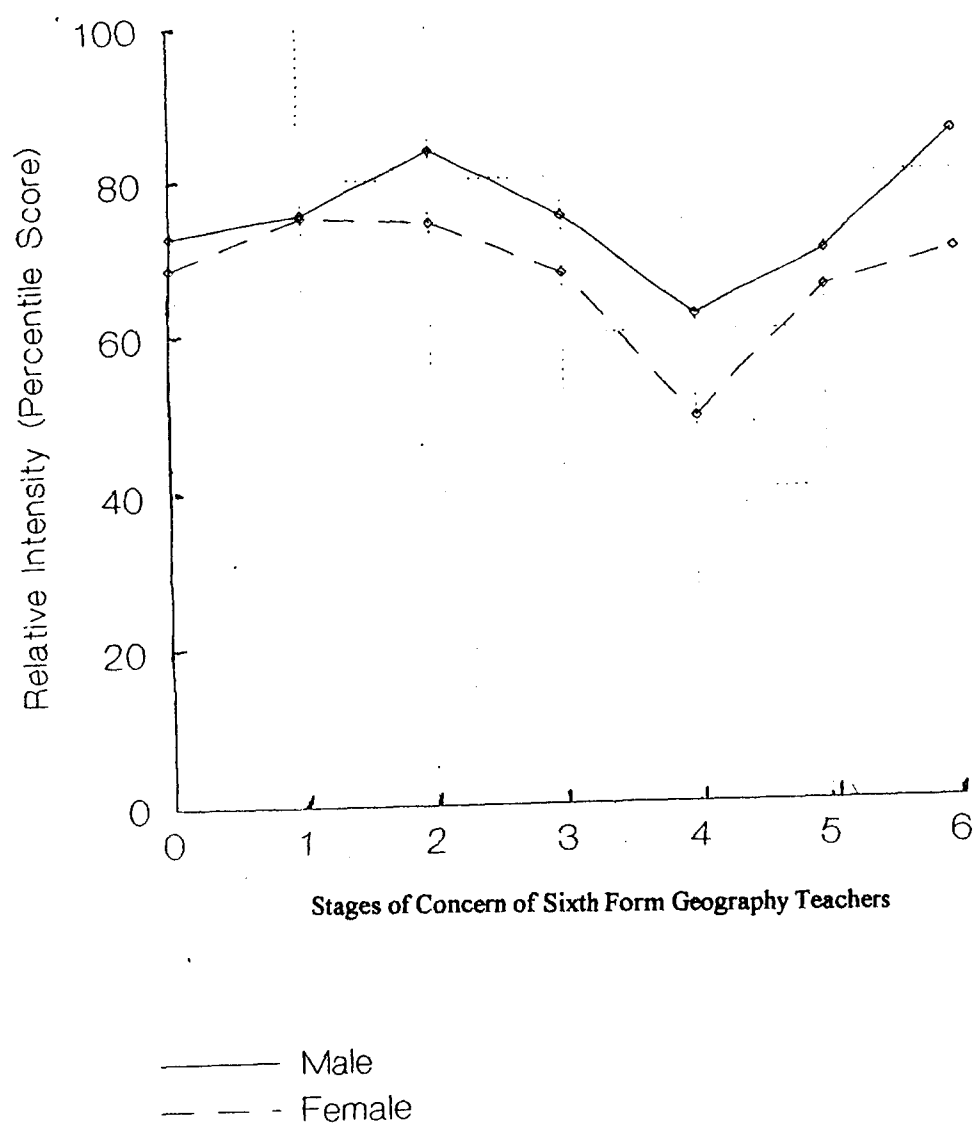
Table 9. Means, Standard Deviations and Intensity of SoC Percentile Scores for Teachers according to Gender

Stages of Concern	Gender					
	Male			Female		
	<u>M</u>	<u>SD</u>	I	<u>M</u>	<u>SD</u>	I
	<u>n=10</u>			<u>n=20</u>		
0	73.00	21.60	High	68.90	22.52	Moderate
1	75.60	11.12	High	75.20	15.28	High
2	83.80	9.15	High	74.40	22.67	High
3	75.00	16.43	High	67.75	25.93	Moderate
4	62.10	19.15	Moderate	49.25	21.86	Moderate
5	70.20	22.36	High	65.50	21.62	Moderate
6	85.20	10.02	High	70.00	23.28	High

As shown in Table 9 above, the female teachers' concern intensity are high in Stage 1 (Informational concern), Stage 2 (Personal concern) and Stage 6 (Refocusing concern). This indicates that the female teachers have high "self" and impact concerns which have yet to be resolved.

Using the mean percentile scores from Table 9, group profiles indicating the SoC of sample teachers were drawn. As shown in Figure 5, the profiles of the two groups show high intensities in "self" concerns (Stages 1 & 2) and impact concern (Stage 6). While it may be unusual to note the high intensities in the above three stages, considering the innovation was introduced since the year 1996, it is no surprise that unresolved "self" concerns might actually lead to high

Figure 5. Group Profiles of Teachers' SoC by Gender



“impact” concern (Refocusing). This is because while the teachers have intense concerns about what the innovation entails and uncertainties about the innovation, they think they have better alternatives to the existing innovation.

Both profiles also indicate rising collaboration concern (Stage 5). There is a rising concern on coordination and cooperation with other teachers regarding use of the innovation. The low consequence concern (Stage 4) displayed by both groups show a low interest in the impact of the innovation on students. This might be due to the fact that at this point in time, these teachers are more concerned on how best to use the innovation and less concerned about the effects of the innovation on their students.

The group profiles of teachers’ SoC by gender in Figure 5, also show a similar pattern in their concerns although the male teachers seem to have higher intensity in all their concerns when compared to their female counterpart. This seems to contradict earlier research findings by Hall, George and Rutherford (1977), Johnson (1984), Puolos (1984), Penn (1985), and Suksangsri (1987) which did not find any outstanding relationship between gender and the concerns data. This may be due to the fact that 60.00% of these male teachers did not attend any in-service training organized by the State Education Department as compared 50.00% of the sample female teachers. Further research is required since the sample size for male Geography teachers in this study is small (10 teachers).

SoC and levels of teaching experience

Teachers were categorized into two different levels of teaching experience in terms of number of years in the teaching profession. These two levels are (a) less than 10 years, and (b) 10 years and above. Table 10 presents the mean percentile scores (M), the standard deviations (SD) and intensity (I) of the SoC of these two categories of teachers.

Table 10. Means, Standard Deviations and Intensity of SoC Percentile Scores for Teachers with different number of years of Teaching Experience.

Stages Of Concern	Years of Teaching Experience					
	Less than 10 years			10 years and above		
	<u>M</u>	<u>SD</u>	I	<u>M</u>	<u>SD</u>	<u>I</u>
	<u>n</u> =20			<u>n</u> =10		
0	71.70	21.33	High	67.40	23.98	Moderate
1	73.70	14.82	High	78.60	11.63	High
2	75.00	23.20	High	82.60	7.40	High
3	68.30	25.33	Moderate	73.90	18.70	High
4	52.70	24.00	Moderate	55.20	16.63	Moderate
5	67.05	22.82	Moderate	67.10	20.10	Moderate
6	71.85	24.30	High	81.40	10.14	High

As shown in Table 10, for teachers with teaching experience of 10 years and above, their concern intensity are high in Stage 1 (Informational concern), Stage 2 (Personal concern), Stage 3 (Management concern) and Stage 6

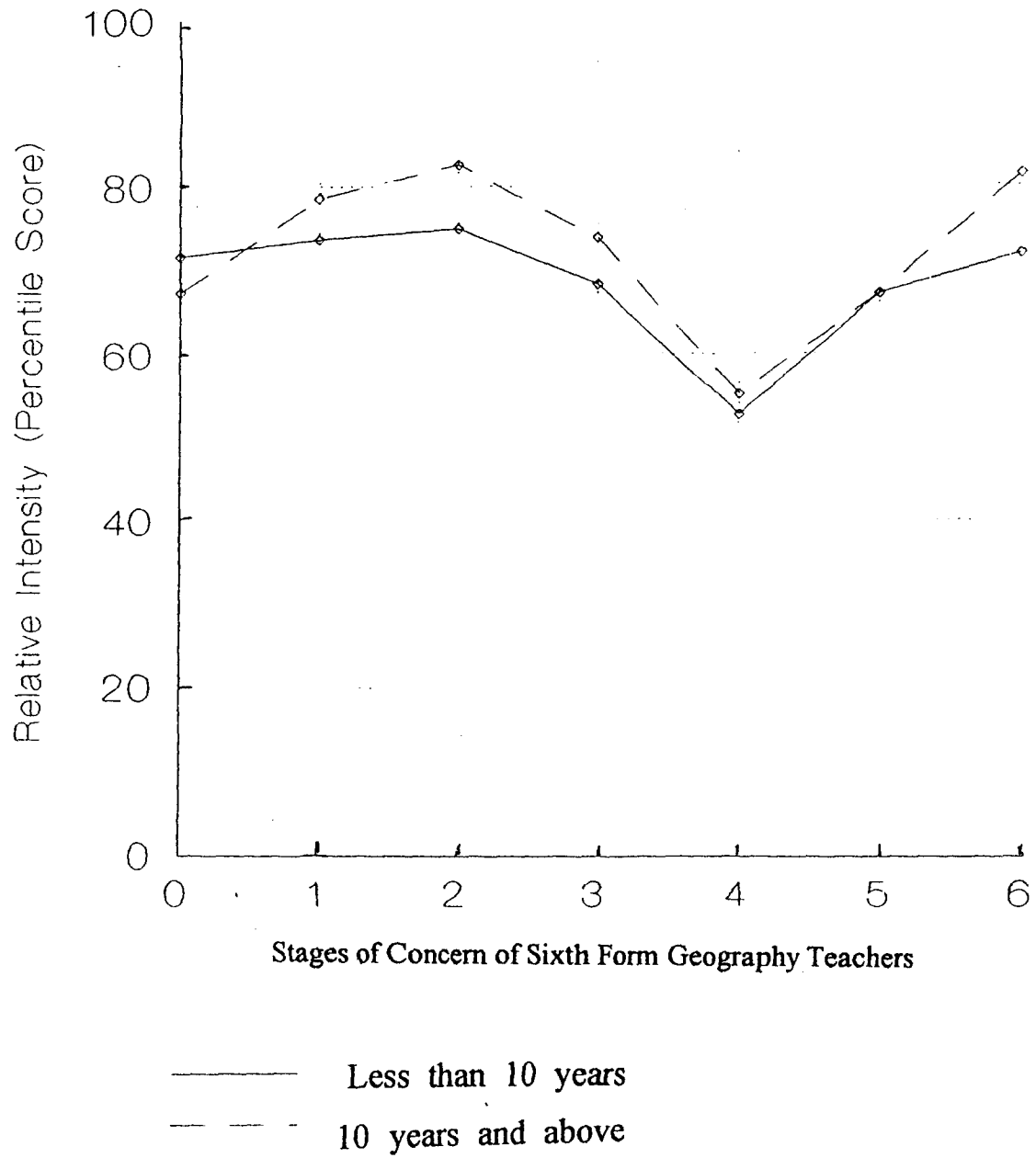
(Refocusing concern). These four SoC depict mean percentile score of 70 and above. As for teachers with less than 10 years of teaching experience, their high intensity of SoC is in Stage 0 (Awareness Concern), Stage 1 (Informational), Stage 2 (Personal) and Stage 6 (Refocusing).

From Figure 6, it can be seen that teachers with less than 10 years teaching experience have higher “self” (Stages 0 to 2) and refocusing (Stage 6) concerns. Their concerns for management (Stage 3) and collaboration (Stage 5) with other teachers are moderately high whereas their consequence concern (Stage 4) is moderately low.

For the teachers with teaching experience of 10 years and above, their profile shows that as they move from Stage 0 to Stage 2, their intensity of concern increases. This is in agreement with the CBAM’s developmental nature of concerns which hypothesized that as individual’s use of the innovation progresses over time, their concerns will also progress from lower to higher stages.

The CBAM also contends that lower stage concerns must be resolved or decreased in intensity as higher stage concerns are aroused. Thus, as individuals progress from lower to higher SoC, it would be reasonable to expect the self concerns (Stages 0 to 2) of experienced users to be less intense than their impact concerns (Stages 4 to 6). However, this is not the case in this study. From the profile, it is surprising to note that even though these experienced teachers have resolved their awareness concern, their concerns for Stages 1 and 2 are still higher than that of the teachers with less than 10 years teaching experience. This suggests that their self concerns become more intense the longer they are involved

Figure 6. Group Profiles of Teachers' SoC by Years of Teaching Experience



with the innovation. The profiles also show that while both groups of teachers display moderately intense concern for Stages 4 and 5, their concern for Stage 6 is aroused.

From the slight differences in the two groups' SoC mean percentile scores, it would be reasonable to suggest that these slight differences may not be large enough to be statistically significant. This is in line with findings from studies by Hall, George and Rutherford (1977), Johnson (1984), Poulos (1984), Bauer (1987) and Suksangsri (1987) who found that the number of years of teaching experience does not affect an individual's concerns about the innovation. Thus it would be better not to use this demographic variable of teaching experience as the basis for planning any intervention measure to help teachers resolve their 'self' concerns.

SoC and Location of School

The total sample of teachers were categorized into two groups according to the location of the school, that is, urban school and rural school. Table 11 reports the mean percentile scores (M), standard deviations (SD) and the intensity (I) of the SoC for the total sample of teachers grouped under the above categories.

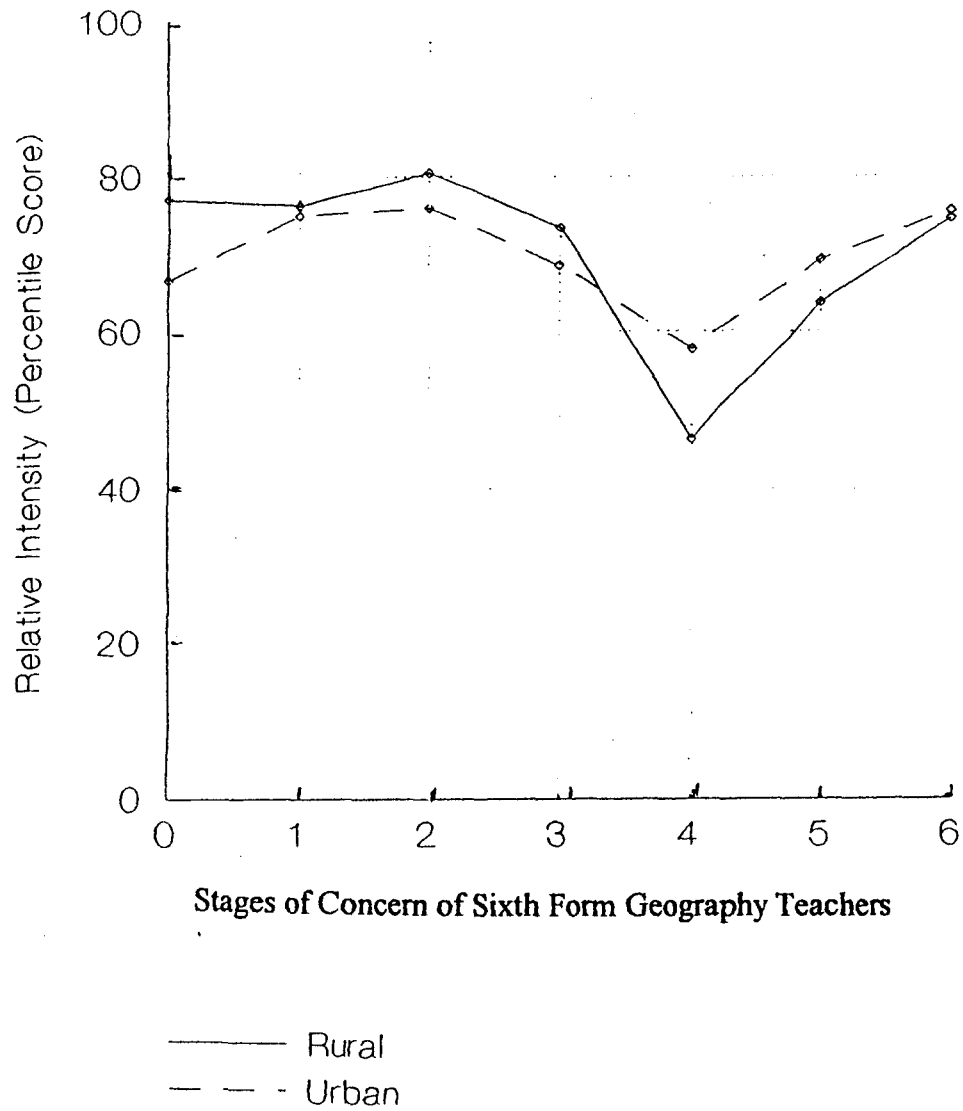
As shown in Table 11, the urban school teachers have high concern intensity in Stage 1 (Informational concern), Stage 2 (Personal concern) and Stage 6 (Refocusing concern). These three SoC depict mean percentile score of 70 and above. As for the rural school teachers, their high intensity of SoC is in Stage 0 (Awareness Concern), Stage 1 (Informational), Stage 2 (Personal), Stage 3 (Management) and Stage 6 (Refocusing).

Table 11. Means, Standard Deviations and Intensity of SoC Percentile Scores for teachers with different Location of School

Stages Of Concern	Location of School					
	Urban School			Rural School		
	<u>M</u>	<u>SD</u>	I	<u>M</u>	<u>SD</u>	I
	<u>n=19</u>			<u>n=11</u>		
0	66.37	23.38	Moderate	77.00	18.22	High
1	74.84	16.34	High	76.18	8.54	High
2	75.84	23.21	High	80.46	11.25	High
3	68.37	27.01	Moderate	73.27	14.99	High
4	57.68	24.70	Moderate	46.36	12.66	Moderate
5	69.11	23.27	Moderate	63.55	18.87	Moderate
6	75.42	24.37	High	74.36	14.33	High

As shown in Figure 7, the profiles of the two groups of teachers are almost similar in shape. However, the teachers in the rural schools have higher “self” (Stages 0 to 2) and management (Stage 3) concerns when compared to the teachers in the urban schools. This may be due to the fact that over 90% of these rural school teachers have less than 10 teaching experience. They are less concerned about the impact of the innovation on the students as shown in the moderately low concern for Stage 4. However, from the rising Stages 5 and 6 concerns, it can be deduced that these teachers do feel the need to collaborate with other teachers in order to improve the use of the innovation.

Figure 7. Group Profiles of Teachers' SoC by Location of School



The teachers in the urban schools have relatively lower self and management concerns but higher impact concerns as compared to the teachers in the rural schools. This indicates that the teachers in the urban schools have resolved slightly their self and management concerns and at the same time, more of their impact concerns are aroused.

From the slight differences in the two groups' SoC mean percentile scores, it would be reasonable to suggest that these slight differences may not be large enough to be statistically significant. Thus it would be better not to use this demographic variable of location of schools as the basis for planning any intervention measure to help teachers resolve their concerns.

Teachers' LoU about the Curriculum Innovation

A teacher is deemed a user of the innovation if he or she is currently using the innovation in the school. The results of the analysis of data on teachers' LoU and interpretations made are organized as follows: Descriptive statistics using frequency count and percentage, are used to indicate LoU for (a) the sample as a whole, and (b) the various teacher groups categorized in terms of the demographic variables of gender, teaching experience, and the location of the school.

LoU for the sample

Table 12 presents the overall percentage and frequency distribution of the teachers' LoU. For the sample of 30 teachers, 16.67% (5) were assessed at LoU

IVb ((Refinement), 43.33% (13) at LoU V (Integration), and 40.00% (12) at LoU VI (Renewal).

Table 12. Percentage and Frequency distribution of Teachers' LoU

Levels of Use (LoU)	Frequency	Percentage
0	0	0.00
I	0	0.00
II	0	0.00
III	0	0.00
IVa	0	0.00
IVb	5	16.67
V	13	43.33
VI	12	40.00
Total	30	100.00

From the above table, only a small group of teachers (16.67%) who were assessed at LoU IVb were focusing most of their efforts on making changes in the use of the innovation so as to bring greater impact to the students.

For the biggest group of teachers (43.33%) assessed at LoU V, they expressed the need to collaborate and cooperate with other teachers for the purpose of achieving greater impact. This need was generated because of the lack of text books and reference books available on the market and in the school libraries. Thus, these teachers felt the need to share resources especially for up to date data and information. The topic of fieldwork also posed considerable difficulties to the teachers as most of them did not know exactly how to go about teaching it. Most of them felt they were inadequate to teach the necessary

geographical skills for fieldwork. Collaboration at zonal level was carried out at least once a semester to enable teachers to share resources, information and experience. Other informal meetings were also carried out among smaller groups of teachers on their own initiative.

The group of teachers who were assessed at LoU VI (40.00%) regarded the new innovation as something good and timely. While the innovation has its strengths, it is not without weaknesses. These weaknesses led the teachers to look for better ideas or alternatives to improve on their use of the innovation. The frequent collaboration with teachers from other schools also enabled them to discuss and exchange ideas or alternatives to the innovation. These teachers felt that the innovation was too selective and limited in scope by stressing too much on the tropical region and neglecting other climatic zones. The examples given in the syllabus were also inadequate. They, therefore, tried to supplement the innovation by giving more relevant and extensive examples which will make the lesson more meaningful.

LoU and Gender

The percentage and frequency distribution of teachers' LoU by gender is presented in Table 13. For the male group, 50.00% (5) of the subjects were assessed at LoU V (Integration) and the other 50.00% (5) at LoU VI (Renewal). As for the female group, 25.00% (5) of the subjects were assessed at LoU IVb (Refinement), 40.00% (8) at LoU V (Integration) and the remaining 35.00% (7) were assessed at LoU VI (Renewal).

Table 13. Percentage and Frequency Distribution of Teachers' LoU by Gender

Levels of Use (LoU)	Gender			
	Male		Female	
	Frequency	Percentage	Frequency	Percentage
0	0	0.00	0	0.00
I	0	0.00	0	0.00
II	0	0.00	0	0.00
III	0	0.00	0	0.00
IVa	0	0.00	0	0.00
IVb	0	0.00	5	25.00
V	5	50.00	8	40.00
VI	5	50.00	7	35.00
Total	10	100.00	20	100.00

The results seem to indicate that both groups have progressed to higher LoU and they have the need to cooperate with other teachers for greater impact in the use of the innovation. Both groups have also developed some ideas on how to refine the existing innovation to make it more effective in their teaching.

LoU and Teaching Experience

The percentage and frequency distribution of teachers' LoU by years of teaching experience is presented in Table 14. For teachers with less than 10 years teaching experience, 20.00% (4) were assessed at LoU IVb (Refinement), 50.00% (10) at LoU V (Integration), and 30.00% (6) at LoU VI (Renewal). As for the 10

Table 14. Percentage and Frequency Distribution of Teachers' LoU by Years of Teaching Experience

Levels of Use (LoU)	Years of Teaching Experience			
	Less than 10 years		10 years and above	
	Frequency	Percentage	Frequency	Percentage
0	0	0.00	0	0.00
I	0	0.00	0	0.00
II	0	0.00	0	0.00
III	0	0.00	0	0.00
IVa	0	0.00	0	0.00
IVb	4	20.00	1	10.00
V	10	50.00	3	30.00
VI	6	30.00	6	60.00
Total	20	100.00	10	100.00

years and above group, 10.00% (1) were assessed at LoU IVb, 30.00% (3) at LoU V, and 60.00% (6) at LoU VI.

The results indicate that both groups have progressed to higher LoU, that is, LoU IVb, LoU V and LoU VI. However, for the more experienced group, the majority (60.00%) were able to progress to the final stage, that is, Stage LoU VI. These teachers are actively looking for alternative ideas and ways to supplement and improve the innovation.

The bulk of the teachers with less than 10 years teaching experience (50.00%) could only progress to Stage LoU V. Out of these 10 teachers, half of them gave the reason "not enough text books and reference books in our school libraries" to explain their need to collaborate with other teachers to share

resources. These teachers also expressed the need to share up-to-date data and information especially for the paper of Human Environment (Paper 2).

LoU and Location of School

Table 15 shows the percentage and frequency distribution of the teachers' LoU according to the location of the school. For the group of Urban School teachers,, 16.00% (3) of them were assessed at LoU IVb (Refinement), 31.00% (6) at LoU V (Integration), and 53.00% (10) at LoU VI (Renewal). As for the group of rural school teachers, 18.00% (2) were assessed at LoU IVb, 64.00% (7) at LoU V, and 18.00% (2) at LoU VI.

Table 15. Percentage and Frequency Distribution of Teachers' LoU by Location of School

Levels of Use (LoU)	Location of School			
	Urban School		Rural School	
	Frequency	Percentage	Frequency	Percentage
0	0	0.00	0	0.00
I	0	0.00	0	0.00
II	0	0.00	0	0.00
III	0	0.00	0	0.00
IVa	0	0.00	0	0.00
IVb	3	16.00	2	18.00
V	6	31.00	7	64.00
VI	10	53.00	2	18.00
Total	19	100.00	11	100.00

For the urban school group, the bulk of the teachers (53.00%) were at the last stage, that is, LoU VI. While only 47.00% of these teachers have teaching experience of 10 years and above, the proximity of the different urban schools enables these teachers to come together easily for discussion and sharing of ideas and resources. Most of these teachers also took the initiative to organize informal discussion sessions frequently. This may help to account for the high frequency of them at LoU VI.

As for the rural school group, the majority of the teachers (64.00%) were assessed at Stage LoU V. This depicts that there is a need for cooperation and collaboration with other teachers from other schools. This is not surprising as almost 91.00% of these teachers have teaching experience of less than 10 years. Furthermore, these teachers do not have many opportunities to attend formal group discussions organized by the State Education Department which are infrequent. Informal group discussions are rarely initiated by the teachers due to the distance between the various rural schools.