THE ECONOMICS CONCEPTS OF SIXTH AND SEVENTH FORM SECONDARY SCHOOL STUDENTS AND THEIR TEACHERS

A thesis

submitted in fulfilment

of the requirements for the Degree

of

Master of Philosophy

at the

University of Waikato

by

SAMUEL D. ORERE-CLIFFORD

University of Waikato

1985

ABSTRACT

The nature of teaching and learning continues to elude educators and researchers despite over half a century of research in teaching and learning. The central problem seems to be how teachers should practise their profession to facilitate student learning. In this regard, there has been several suggestions such as developing certain teacher personality attributes (Ryans, 1960), special teaching behavioural techniques (Rosenshine, 1976a) and the child-centered education of Piaget (1966) and Ausubel (1968).

More recently, studies such as the Learning in Science Project of the University of Waikato (e.g., Osborne, 1981a) have drawn attention to the suggestion that children tend to develop misconceptions about scientific phenomena in the classroom. It is felt this could be due to teachers not tapping and relating new material to children's previous knowledge and cognitive structures.

This study sought to examine the suggestions of the Learning in Science Project as described above with regards to Economics. The investigation was therefore aimed at uncovering the Economics ideas Sixth and Seventh Formers generated about certain Economics concepts after lessons. It also investigated the nature of conceptions held by their teachers for the same concepts.

The method of investigation included both qualitative and quantitative features. A qualitative approach was used to uncover the ideas held by a small sample of students. This was then reduced into a survey format and administered to a large sample of students and teachers.

The findings of the study suggest that Sixth and Seventh Form Economics Students possess conceptions of Economics not generally acceptable to Economists. This substantiates the suggestion of the Learning in Science Project that learners tend to develop misconceptions about phenomena introduced in the classroom. However, the findings of the study also indicate that the teachers of the students also possess misconceptions about Economics concepts. The suggestion is therefore made that students' misconceptions about Economics concepts may not necessarily be due to teachers not taking students' past knowledge into account, but to the possibility that teachers may be introducing misconceptions about Economics concepts in the classroom.

The study, therefore, suggests that teaching and learning may be enhanced if teachers take stock of the state of their knowledge of subject matter constantly and also introduce concepts to students in such a way as to retain the meanings of experts.

ACKNOWLEDGEMENTS

One naturally heaves a sigh when an endeavour comes to a conclusion. But the achievement of an enterprise loses its substance when the contributions of others, both direct and indirect, are not acknowledged. I take this opportunity, therefore, to express my sincere gratitude to all the persons who, in one way or the other, contributed to the success of this study.

I thank very much Mr. W. J. Joyce of the Office of the District Senior Inspector of Secondary Schools, Department of Education, Hamilton, who provided me the permission to work with the schools concerned, and the Principals, Economics Teachers and the Sixth and Seventh Form Economics Students of Hillcrest High School and Hamilton Boys High School both of Hamilton. My sincere regards also go to all the schools in the Waikato Educational District, especially the Principals, the Economics Teachers and the Sixth and Seventh Form Students who readily cooperated in the second phase of the study.

I also thank very much my supervisors, Prof. Peter Freyberg, Neil Haigh and Bob Katterns, all of the Department of Education, University of Waikato, for the valuable assistance, advice and suggestions rendered from the conception and duration of the study. Special and sincere thanks to Bob Katterns and Neil Haigh for the especial assistance during the period of fieldwork and the valuable and great advice also in the second phase of the study.

My very special thanks go to Bob Katterns for providing the very much needed pressure, friendship and constructive suggestions in the write-up stage. The pressure was timely as it made me work so hard during the day and at night. It was simply great. Thanks Bob.

I thank also Ms Margaret Taylor, Mrs Jan Russel, Mrs Yo Nielson and Mr B.C. Atwool, all of the Registry, University of Waikato, who helped one way or the other towards the success of the study. I also thank Ms Dorothy Anderson, Mrs Kay Wills and the University Grants Committee for making it possible for me to study in New Zealand.

Warm regards to Val Lazenby, Lorraine Brown and Mary Ann Giffon for the typing of the manuscripts, tables, figures and punching data in the computer terminal. I am appreciative also of the helpful hints given to me by Peter Fava, a colleague, during the editing of the manuscripts on the computer.

Lastly, but not the least, my especial and very warm affection and appreciation for the wonderful family support given to me by my wife, Ufuoma, and our dear son Efe. It was a delight to come home, looking very tired, into the golden and loving welcome of Ufuoma and Efe. I will always

remember Efe, in his little cheerful and happy ring of voice, asking, in a joyous welcome, "Did you go to office, Dad? Did you go to work, Dad? I wanna go to office too!" It made me feel so confident that, sooner or later, the enterprise would be over, and we would all go to the river and watch the ducks glide gracefully on the calm brackish waters of the Waikato River.

SAM D. ORERE-CLIFFORD
University of Waikato
Hamilton, New Zealand
January 7 1985

CONTENTS

LIST OF TABLES

Table:

LIST OF FIGURES

Figure:

CHAPTER ONE

I N T R O D U C T I O N

Despite over half a century of research into the teaching and learning process, a definitive and universally accepted account of its nature continues to elude teachers, teacher educators and researchers. The many investigations and dialogues, however, have not been in vain. They have certainly pointed to the extreme complexity of the teaching-learning process and the numerous research problems that remain un-resolved.

Some of the complexities of that process have been highlighted in studies in which the investigators have attempted to identify factors that may account for the difficulties that teachers sometimes experience when they set out to help students acquire new concepts(Osborne, Freyberg and Tasker, 1979a,b,c,d,e; Tasker and Freyberg, 1982). One of the factors that has received close attention recently is the match-mismatch between the meanings that learners and teachers have in mind for particular concepts.

This research, in particular, has been prompted by two developments. First, there has been a general shift in psychology away from behaviouristic models of the learning process to those that emphasize the information- processing capabilities of human beings, including the capacity to construct their own meanings from their own experiences

(Piaget 1960, 1964; McCall and McGhee, 1977; Flavell, 1977; Tasker and Freyberg, 1982; Freyberg and Osborne , 1981; Happs, 1981a; Osborne and Wittrock, 1983). The orientation emphasizes the uniqueness, as well as the similarities in the way people make sense of their experiences. Second, much recent research on teaching has been associated with the view that the relationship between teaching and learning is a probabilistic rather than a causal one, and that there can never be the certainty, therefore, that a teacher's intentions in respect to student learning will be realized (Stephen 1967, Haigh 1981). This view reflects an acknowledgement that teachers cannot, in reality, directly control many of the factors operating in a teaching - learning situation. The prior experiences and existing concepts of learners are two such factors. Others include what features learners select out of a welter of in-coming data and the particular mechanism each uses to process selected data. Reflecting on these views, Freyberg and Osborne (1981, p.10) point out: "...no matter what curriculum framework is employed, nor what principles teachers use in organizing the subject matter, learners are going to structure that subject matter in their own way."

Studies completed to date which have explored teacher and learner concepts provide evidence that teachers frequently do not appreciate the nature and extent of differences between the meanings students associate with particular terms and those that they wish to teach (Happs, 1981a; Tasker and Lambert, 1981b; Schollum, 1981). Thus,

for instance in the final report of the Learning in Science Project (LISP) of the University of Waikato (Tasker and Freyberg, 1982), it is suggested that students often continue to attribute everyday (i.e. non-scientific) meanings to terms introduced in science lessons despite the efforts of teachers to introduce them to a scientific meaning.

Reasons for this mismatch include the failure of teachers to take into account the ideas that students already have, as well as the previous experiences that might have shaped them when planning learning activities. This occurs, despite the fact that there is a consensus that education should be learner-centred. There is the suggestion, too, that the mismatch could stem from teachers' poor background or inadequate knowledge in science (Tasker and Freyberg, 1982). The significance of this could be that teachers may unknowingly introduce learners to non-scientific but seemingly scientific concepts, or reinforce the non-scientific views of learners. For instance LISP points to the fact that a lot of the terms used in sciences, such as animals, friction and force, have both everyday and scientific meanings. There is the possibility, therefore, that teachers may not provide an adequate differentiation between the meanings of the terms as used generally in the everyday sense from their technical meanings. Students thus may develop concepts of science closer in meaning to the everyday sense but unacceptable to the scientific community.

The full extent, however, to which these factors do contribute to teachers' difficulties in facilitating concept learning by students, or accounting for the mismatch are not yet established. To date, studies that provide some evidence of the occurrence of conceptual mismatches between teachers and learners have mostly come from the field of science (Leboutet-Barrell, 1976; Driver and Easley, 1978; Helm, 1980; Watts, 1981; Happs, 1981a; Stead and Osborne, 1980; Tasker and Freyberg, 1982). It is not known, however, whether this conceptual mismatch is peculiar to science or can be generalized to other curriculum areas. For instance, does such a mismatch occur in the field of social science and the humanities, and especially in those subject areas which embrace a high degree of technical terms which may also be used by lay persons?

One such subject is that of Economics. Relatively new in the New Zealand secondary school curriculum, this subject is taught in the Third, Fourth and Fifth forms as part of Social Studies under the theme Economics Studies. In the final two years of the secondary school curriculum, however, the discipline called Economics is often available as a study in its own right. It was this area, namely, the study of Economics by Sixth and Seventh Form Students that was the focus of the present research.

Because Economics involves many technical terms that may be used by "Expert" and "Person in the street" alike, Economics seemed to present potential for conceptual mismatch in the minds of students. To illustrate, Economics

terms such as Money, Price, Demand and Returns come to mind.

Purposes of the Study

In the light of the above discussion the present study had three major aims:

1. To identify the concepts or meanings Sixth and Seventh Form Economics Students associated with certain Economics terms that featured in their studies.

2. With reference to these same terms, to identify the meanings carried by the teachers of these students.

3. To examine the nature of match , if any, that was evident between student and teacher conceptions of the Economics terms being researched in relation to the meanings that Economists have for the same terms.

The method of investigation incorporated both qualitative and quantitative approaches. A qualitative approach was used to uncover the meanings that a sample of students associated with certain Economics terms. This set of meanings was presented subsequently in a survey format to a large group of students and teachers who were asked to indicate the extent to which these meanings reflected their own. In addition, the large sample of students and teachers was asked to record any personal meanings for these concepts that were not included in the survey.

It was hoped that the study would contribute to our

understanding of the teaching and learning of Economics in particular, and teaching and learning in general. With regard to Economics, it was hoped that the study would provide some evidence as to whether conceptual mismatches, as found in science, also occurred, and if so, the nature of the mismatch. This would, perhaps, help sensitize teachers and curriculum developers to the meanings students might generate about basic Economics concepts in relation to the objectives of the Economics curriculum.

Overview of the Study

Besides this introductory chapter and the concluding chapter which summarises the study and its implications, the rest of the research report comprises three sections. Chapter Two presents a review of related research where discussion focuses first, on the conceptual and methodological shifts of research in teaching and learning, and second, on studies done in Economics teaching and learning. Chapter Three describes the research design and methodology. In Chapter Four, the results of the study are presented and discussed.

CHAPTER TWO

REVIEW OF RELATED RESEARCH

Mainstream research on teaching has been preoccupied with the establishment of causal relationship between the use by the teacher of particular methods and skills and improved student achievement. This process - product orientation to research rests on the assumption that there is a direct link between teaching behaviours and learning acquisitions. The research findings have been disappointing (Dunkin and Biddle, 1974; Heath and Nielson, 1974) and, despite the tendency to persist with the process-product research model (Medley, 1977; Gage, 1978; Borich, 1979; Brophy and Evertson, 1976), at the present time we do not have any universal method of teaching - that is, one which is effective with all learners in all situations (Katterns, 1978; 1982; Haigh and Katterns, 1984).

Over the past decade the view that student learning is a direct result of teaching has been challenged. There is the contention, reflecting Piaget's position (Piaget, 1930, 1954, 1960, 1964), that students generate their own meanings or learning from lessons, and that these do not necessarily reflect or match a teacher's objectives. A concomitant of this view has been a shift in educational research from teaching and teacher goals perspectives, to an examination of the nature and extent of the uniqueness of the meanings that students individually develop through experiences both

outside and inside the classroom.

This research focus has meant a change in style of investigative methodology from a quantitative to a qualitative approach, or to some combination of these two. The methodological shift reflects the view that quantitative methods on their own, do not provide an appropriate means of unearthing the complexities and the uniqueness of the meanings that students generate over a series of learning experiences.

The present chapter reviews both theoretical and empirical research literature that is related to the content and methodological shifts mentioned above, as well as the limited amount of research that is available on the focus of the present study, namely, the learning of Economics concepts. The review is organised in sections as follows:

1) Shifts in Research Focus:
   a) From Quantitative to Qualitative Research;
   b) From Teaching to Focus on Student Meanings;
   c) The Qualitative-Quantitative Research Model;
2) The Teaching and Learning of Economics; and
3) Summary and Conclusion.

SHIFTS IN RESEARCH FOCUS

Systematic research on the teaching process and its effects on student achievement is but 50 years old. Early studies focussed on teacher personality (e.g., Ryans, 1960) and the relative efficiency of various teaching methods (e.g., Cronbach and Snow, 1977; Shavelson and Russo, 1977;

Rosenshine, 1976a). While such studies persist, Gage (1963,1964) initiated a new thrust which sought to overcome the inconclusiveness of earlier research. Specifically Gage urged that educational research should adopt the research strategy of the natural sciences: to discover elements, relationships among the elements, and attempt to build up mini-theories about causal relationships between elements, leading subsequently to a grand theory.

In the case of teaching, therefore, it would be necessary first of all to identify the component skills of the teaching art, next to discover correlations between the use of individual teaching skills and combinations of skills with student achievement, and then to set up experimental studies in which teaching skills and their combinations were purposely manipulated and compared for their relative impact on student learning. Clearly, this process-product orientation to research was in the positivistic tradition: it was concerned with systematic analysis in correlational and experimental research designs aiming at the prediction and control of student's classroom learning behaviour - in short, with universal laws to which effective teaching should adhere.

Although research in this mould has persisted as the mainstream, it has been evaluated variously. On the positive side Rosenshine (1976a,b), Medley (1977), Gage (1978), Brophy and Evertson (1976) suggest that there are strong relationships between teaching skills and student achievement. Brophy and Evertson (1976) for example,

suggest that teacher praise is related with high student achievement in low socio-economic classrooms, while it is the case of teacher criticism and achievement in high socio-economic classrooms. Rosenshine (1976a,b) also suggests a positive relationship between time spent on reading and mathematics instruction and achievement.

On the negative side, however, Dunkin and Biddle (1974) highlight the many equivocal research findings, while other researchers (Tom, 1980; Flanders, 1983; Katterns, 1978; 1982; Haigh and Katterns, 1984) have argued that process-product offers little direct guidance to teacher educators responsible for pre-service and in-service programmes for teachers.

A number of reasons have been offered to explain the failure of process-product research to produce clear cut findings about causal links between certain teaching behaviours and student learning. Rosenshine (1976b) suggests that the research methods are not properly constructed, while Gage (1978) and Heath and Nielson (1974) point to statistical and measurement problems. Dunkin and Biddle (1974, p.14) also suggest four reasons:

1) Failure to observe teaching activities;
2) theoretical impoverishment;
3) use of inadequate criteria of effectiveness; and
4) lack of concern for contextual effects.

Others, like Stephen (1967), go as far as to question the rationale behind the investigations and suggest that academic achievement is determined by factors within the students, and little if at all, by teachers. Criticisms

such as those above influenced some researchers into taking another look at the nature of teaching and learning, and the appropriateness of using natural science methods in social science research.

From Quantitative to Qualitative Research

In keeping with the positivistic research tradition, mainstream studies on teaching and learning have focussed on the quantitative analysis of overt behaviours. While some such studies have attempted to tap the attitudes behind overt behaviour by means of questionnaires, in the main there has been too little concern with covert thoughts and feelings of teachers and students which can influence their overt actions. Haigh (1981), for example, suggested evidence of the possible influence that the thinking of teachers had over their teaching. Teachers' thinking, for instance, is not readily observable in teaching though it could determine the questions they will ask and the type of reinforcements they may dispense in lessons.

Recently the suggestion is gaining ground that students' covert actions such as their thinking and past knowledge influence the meaning and cognitive structures they develop about lesson events (Stead and Osborne, 1981a,b; Osborne and Wittrock, 1983). This substantiates to some extent Stephen's (1967) suggestion that student learning could be determined by factors within the students themselves such as the students' past knowledge, levels of motivation and affect (McCall and McGhee, 1977). This suggestion, of course, is not new because earlier on Piaget

(Flavell, 1977; Piaget, 1966) had made a similar suggestion in his accommodation-assimilation theory of cognition. According to Piaget, learning is influenced by an individual's past learning or cognitive structures, and the individual makes meaning out of in-coming data by utilising his/her existing cognitive structures to relate or accommodate in-coming data. Moreover meanings can differ from one person to the other because past experiences, cognitive structures and processes are different. Such differences in cognitive structures and processes do not, of course, preclude some individuals showing or arriving at similar meanings. Of interest, however, is that the interaction of in-coming data and cognitive structures are, in the main, covert actions, and how the interaction works out in the brain is not specifically known.

The concern with uncovering the hidden world of thinking that lies behind teacher and student actions has promoted the adoption of qualitative rather than quantitative research methodologies. An increasing number of researchers have realized, it seems, that because of its complexity and holistic property, the teaching-learning process cannot be described in simple cause-effect terms; nor can researchers readily discuss this process in terms of predictability and control. On the contrary, qualitative approaches are necessary to fathom the complex and often unique thoughts of teachers and students (Parlett and Hamilton, 1975; Fisher and Berliner, 1979; Bogdan and Biklen, 1982).

Unlike quantitative research, researchers using qualitative models tend to approach their studies without preconceptions, propositions or hypotheses, since these might well create artificial situations and affect the credibility of a study. The underlying basis in qualitative research is therefore to describe the nature of a phenomenon as it occurs in its natural setting,illuminating its uniqueness and complexities without any colouring of researcher's assumptions. In view of this, no item of information about a phenomenon can be discarded as being necessarily insignificant.

In qualitative research, other methods instead of controlled experiments or questionnaires are used to obtain data. These include the use of interviews and observations (Spradley, 1979; 1980; Wilson,1977; Wolcott, 1975). Observation may be either participant or non-participant. In participant observation, the qualitative researcher assumes to some extent the features of the researched, and lives within their social organization in order to perceive events from their perspectives (Spradley, 1979; 1980; Becker, 1963; Bogdan and Biklen, 1982). Becker (1963, pp. 83-84) provides a good example of participant observation:

> "I gathered the material for this study by participant observation by participating with musicians in the variety of situations that make up their work and leisure lives. At the same time I made the study, I had played the piano professionally for several years and was active in musical circles in Chicago."

Non-participant observation is somewhat opposite to participant observation in the sense that the researcher does not enter into any social contact with the researched. Thus a researcher may study the behaviour of football fans from television or video programmes without actually being involved with them, or being present at the stadium. It may also take the form of examining several books to see how the sexes or races are portrayed by authors, or, as suggested by Pelto (1970), in the form of certain questionnaires.

The interview is used when the researcher does not want to indulge in a participant observation, but wishes to obtain some ideas directly from people about the impressions, attitudes, knowledge or meanings they have developed about events (Spradley,1979, 1980).

Qualitative research methods, of course, have long ago been used in anthropological studies (Wilson, 1977; Wolcott, 1975) and also in the study of teaching and school life as long ago as the mid-1960s. Smith and Geoffrey (1968) used qualitative methodology to study the classroom experiences of an urban school, while Rosenfeld (1968) used participant observation to study the social organization, teaching and learning experiences of a school in a black neighbourhood in New York. Moreover, Furlong (1977) was able to obtain some information about how students perceived their teachers and rebelled against the school system by the use of interviews. The Learning in Science Project at the University of Waikato, Hamilton, New Zealand (e.g., Schollum, 1981; Happs, 1981) also made extensive use of

interviews to determine the ideas children had about certain scientific phenomena.

However, qualitative research has been criticized by positivists on several counts. Katterns (1982) has summarized major criticisms made of qualitative research. He points out, firstly, that contrary to the theoretical claims of qualitative research, critics say that the method may be full of biases such as, (a) the researcher's personal bias of which s/he may be unaware, informants' biases such as telling a researcher what they think s/he ought to know, exaggerating and misinterpreting a situation. There is the added problem of the researcher creating a new social situation with his/her presence and therefore observing a situation different from one without his/her presence. Thus, whether the researcher likes it or not, s/he is studying a situation in which s/he is a member, and not one in which s/he is not. The question, then, is, will his/her report describe the natural state of the phenomenon s/he claims to have studied or a different one?

Secondly, there is the problem of researcher blindness such as not knowing what to look for.

Thirdly, related to the lack of statistical analysis, is the difficulty of generalising from and replicating the findings of qualitative research. But it should be pointed out that knowledge is not necessarily just a matter of generalisations or replications. A piece of information may be unique and we need not necessarily replicate it to accept

and generalise its existence.

Though the criticisms of quantitative researchers about qualitative research are noteworthy, it appears they are made within the assumptions of what constitute credible research by quantitative researchers. It seems this reflects the overriding obsession of quantitative researchers with numerical analysis and hypothetico-deductions as the foundation of knowledge. Thus as Gage (1978) points out, qualitative research can only be verified by quantification, creating the suggestion by some critics that ethnographic research is often like a bad novel, perhaps, by a reader whose expectations of numerical analyses are not being met. Despite the above criticisms, the suggestion of Le Compte and Goetz (1982, p.55) should be noted that "attaining absolute validity and reliability is an impossible goal for any research model". This does not, however, preclude a study from being credible.

Debate will undoubtedly continue on the merit or otherwise of these criticisms. Quite apart from this debate, however, it is significant to note that many qualitative studies of classrooms have dwelt on descriptions and analyses of complex social interactions (e.g., Smith and Geoffrey, 1968), rather than on the nature of conceptual meanings that students carry with them and which could help or hinder learning progress. Passmore (1980) is concerned about the apparent link of learning to teaching in a teaching-learning process conceptualization. He questions whether learning should be included in the definitions or

conceptualizations of teaching. This is significant in the sense that if learning is studied as a product or sub-set of teaching, as in process-product studies, its real nature could be missed.

The suggestion, perhaps, is that teaching and learning should be studied on their own, though this does not necessarily imply precluding the exploration of how they are related. Recently, research seems to be shifting to studying teaching and learning as separate domains. Examples include Haigh's (1981) study on teaching (teacher thinking) and Tasker's (1981) study of pupil learning in science. Perhaps, this shift might contribute towards a better understanding of teaching and learning separately and also the relationship that exists between them.

From Teaching to Focus on Student Meanings

Since the late 1970's, an increasing number of studies has examined the nature of students' meanings and ideas (Nussbaum and Norvak, 1976; Osborne and Gilbert, 1980a; White and Gunstone, 1980; Driver, 1980; Gilbert, Watts and Osborne, 1982; Schollum, 1981; Happs, 1981; Bell, 1981; and Osborne and Wittrock, 1983). The studies have focussed on four interrelated areas:

1) The ideas that learners have about a topic, and bring to lessons.

2) How these ideas influence their learning of lessons.

3) The nature of the meanings that learners

generate over lessons.

4) The match between their meanings and that of their teachers' meanings or objectives.

The findings suggest that learners bring to class a lot of complex ideas about topics not known and shared by their teachers and curriculum experts. In addition, the meanings they develop from lessons tend to be different from their teachers' meanings (Schollum, 1981; Happs, 1981; Bell, 1981). For example, while teachers would consider a worm to be an animal, pupils tended to think otherwise, "a worm is not an animal" (Bell, 1981). Also, while scientists look at soil as a product comprising organic and mineral constituents pupils tend to view soil as a medium for plant growth or home for small animals (Happs, 1981).

In the main, these studies employed qualitative models where in-depth interviews (e.g., Happs, 1981; Watts, 1981) and semi-participant observation (e.g. Tasker and Osborne, 1981) were used to obtain data about what learners knew about certain scientific topics or how they went about the process of learning. Some of the studies concentrated on one learner (Watts, 1981) while others involved several pupils (e.g., Bell, 1981).

Some of the studies included some aspects of quantitative methods, usually the use of questionnaires to determine the frequencies of certain meanings within a larger group of learners (Happs, 1981; Stead and Osborne, 1980; Schollum, 1981). Happs (1981), for instance, prepared a survey from qualitative data to find out the

extent other students shared certain concepts of soils. Each item in the survey had three responses - true, false and not sure - and respondents were asked to indicate the response that reflected their ideas. The shortcoming of this survey, like the others in the Learning in Science Project (e.g., Schollum, 1981; Stead, 1980) was that students were not given the opportunity to express other ideas they might have on points not included in the questionnaires. Certainly the ideas in the questionnaires cannot be said to be the limit of ideas about, say, the soil. The closed nature of the surveys was suggestive of the a priori characteristics of quantitative surveys. Moreover, agreeing or disagreeing to a survey item is not necessarily indicative of an individual's personal meaning of an event. For instance, a person may agree on a questionnaire that children could be an integral element in a successful marriage, but this will not necessarily describe his/her personal meaning of marriage which may not include children. Moreover, s/he may have a peculiar meaning of marriage which may not be captured by questionnaires which tend to be closed. Quantitative surveys designed from qualitative data are enhanced when respondents are given opportunities to express other ideas and also to reflect their personal meanings in addition to the usual requirements of agreeing or disagreeing to an item. This is because surveys should be seen, in this context, as supplementing the qualitative methods of research.

THE QUALITATIVE - QUANTITATIVE RESEARCH MODEL

A number of studies have combined elements from both qualitative and quantitative research methods into a new model. Examples include: studies in the Learning in Science Project (e.g., Freyberg, Osborne and Tasker, 1979; Bell, 1981; Happs, 1981; Schollum, 1981); Madey and Everett's (1978) study on client assessment; and Sieber's (1973) study of the structure of two suburban systems.

Madey (1982) and Sieber (1973) share the view that the combination of both methods enriches the credibility of research and complements each other. For instance, the use of qualitative methods enables a researcher to prevent as much as possible the influence of his/her assumptions on the study, such as commencing a study with a pre-prepared survey format describing items from the researcher's point of view and only asking respondents to respond to the items. Similarly, a quantitative method, such as the survey, may also enable a researcher to check his bias as illustrated by Sieber (1973):

> "Prior to looking at the results of the survey, I predicted the proportion of teachers who would respond in particular ways to survey questions. I then compared my predictions with the actual responses. It became obvious when observing these comparisons that I had unwittingly adopted the elite's version of reality" (Sieber, 1973, p. 1353).

Using quantitative measures, Sieber was also able to detect assumptions he had formed from his qualitative data.

> "The survey not only constrained me to see that my qualitative data collection procedures had been faulty, but also provided the opportunity to learn about an entire stratum which I was now aware of having glossed over in the fieldwork, namely the elementary teachers." (Sieber 1973, p.1353)

Sieber's observation points to the suggestion, perhaps, that each method on its own may not meet the requirements of credible research in the field of social phenomena, and their combination acts as a cross-check. But there are other real advantages in using a combination of the two. Quantitative methods such as surveys are parsimonious, and less time and labour consuming since they can be used with a very large number of subjects. Data obtained through surveys can be enriched by qualitative data as shown by Happs (1981) in his study of children's conceptions of soil.

Yet there can be problems. Bogdan and Biklen (1982) suggest that a combination of both methods could create problems in research design, methodology and analysis. There is also the possibility that during analysis, the researcher may inadvertently use quantitative models to ignore or render a variable or a piece of information as insignificant.

Indeed, the integration of both methods has not met with favour from research purists on both sides. Quantitative researchers like Campbell and Stanley (1966), Rossi and Wright (1977), Page (1978) and Gage (1978) are of

the opinion that the only credible research is the one which adheres strictly to quantitative analysis. Gage (1978), for instance, is of the opinion that qualitative research may meet the requirements of credibility only after it has been subjected to a quantitative verification. However, qualitative research purists point out the supremacy of deep, rich and thick descriptive data (Stake, 1978; Eisner, 1979; Bodgan and Biklen, 1982) and are not impressed by any enhancement of qualitative research by quantitative means. It should be pointed out, nevertheless, that there is no fast line demarcating quantitative from qualitative methods of research, especially when studies of social phenomena are involved. Qualitative methods tend to be open-ended while quantitative methods tend to be closed-ended. The nature of their integration in any study should be determined by the research problem under investigation.

THE TEACHING AND LEARNING OF ECONOMICS

As mentioned earlier, research in the teaching-learning process is shifting to a focus of examining teaching and learning as separate domains. Mainstream research on the latter, however, has concentrated on the field of science (physics, e.g., Caramazz, McCloskey and Green, 1981; chemistry, e.g., Schollum, 1981; biology, e.g., Bell, 1981; earth science, Happs, 1981).

Mainstream research on the teaching and learning of Economics seems to follow the positivistic tradition where Economics learning is assumed to be a direct product of

Economics teaching. Emphasis, therefore, has been placed on producing the techniques of Economics teaching which will produce the desired results of Economics learning (Weidenaar, 1972; Jennings, 1977; Smith, 1977; Alchian, 1978; Rowley, 1979; Brown and Schneider, 1980; Dalgaard, 1984). Efforts have not been made, as in the field of science, to examine the personal meanings students may generate about Economics concepts from lessons, or the ideas that they bring to Economics lessons. The evaluations of Economics teaching-learning process have mostly tended to reflect the effectiveness of teaching methods and students' attitudes towards the methods.

> "The evaluation undertaken did not attempt to measure the effectiveness of the "Apple Experiments" in raising economics knowledge per se, but rather, the reaction of students in terms of its effectiveness as a pedagogical device" (Weidenaar, 1972, p. 96).

In Weidenaar's study, the students were asked to evaluate the teaching method as (i) a medium of instruction, and (ii) a means of learning. In both cases, nearly all the students indicated the method was a good medium of instruction and an effective means of learning. The weakness, however, was that the study did not find out what it was the students had actually learned to add support, at least, to the effectiveness of the method of teaching. A point to note here is that it is possible for students to express their favour for a method of teaching in research, perhaps out of the positive affect they have for their teacher without necessarily enjoying improvements in learning. The

discrepancy between students' positive attitude towards their teacher, his/ her methods of teaching and how they understand a lesson is suggested by Tasker and Osborne (1981). In a visit to a classroom to observe a science lesson, the researchers were told by the students that they favoured the individual method being used by their teacher. The investigators, however, noticed that the students did not appear to understand the lesson and the experiment being done as part of the class exercise. This raises the issue of whether students' approval of their teacher's method is indicative of the effectiveness of the method pedagogically.

What is significant for the present study, however, is the absence of research on the teaching-learning process in Economics to explore and examine the kinds of meanings students develop over Economics lessons, and the relationships between their meanings and that of their teachers. The present study attempted to explore and examine these problems, and it was hoped the findings might be of significance for Economics teachers, economists, curriculum developers and teacher educators.

Summary and Conclusion

This review of related research has attempted to highlight conceptual and methodological shifts in the research on the teaching-learning process. Though a relationship possibly exists between teaching and learning, it is not held to be necessarily a direct one - that is, learning as a dependent variable of teaching. Research has

also focused on learning as a separate domain, and attempts are being made to explore learners' processing of information and the personal meanings they develop thereof. Much of the research, however, has been in the area of science.

The review of related research here has indicated that a study of learning of Economics in secondary schools could provide useful information for curriculum developers, classroom practitioners and economists. Of particular significance here would be not an attempt to identify the most effective teaching methods, but to focus on the concepts that Economics students and their teachers carried and which could shed light on the quality of cognitive interaction occurring in the classroom. It was on this basis that the present study was designed with the aim of uncovering the personal meanings of Economics held by students and their teachers, and the degree of match between their meanings. As discussed in Chapter Three, methodology employed to achieve the aims of the study incorporated elements of the qualitative and quantitative methods.

CHAPTER THREE

D E S I G N A N D M E T H O D O L O G Y

The Review of Related Research in Chapter Two, together with the interest in Economics teaching and learning expressed in the Introduction, gave rise to three interrelated research questions:

1. What meanings do Sixth and Seventh Form Economics students associate with Economics terms that feature in their studies?
2. What meanings do their teachers associate with the same terms?
3. What is the extent of match, if any, between the meanings of the students and their teachers?

As reviewed in Chapter Two, research questions such as these can be pursued by either quantitative or qualitative research procedures, or a combination of both of these. Using a quantitative orientation, for example, the researcher, following his hunches, might have selected certain topics, prepared some questionnaires and administered them to students.

In the present study, however, it was decided to attack the research questions initially by a qualitative study of a small group of Sixth and Seventh Form Economics students and their teachers. It was thought that this approach, involving in-depth interviewing of students about Economics

terms, had the following advantages:

1. It would prevent the assumptions, prejudices and propositions of the researcher from interfering with the study.
2. Data obtained, therefore, from interviews, would reflect the knowledge or meanings as given by the students themselves.
3. Moreover, the terms chosen for the interviews, would also reflect the classroom work of both the teachers and the students.

Subsequently, however, the researcher saw strength in using the "thick" description of the Economics meanings carried by the small student-sample as the basis for developing a questionnaire that could be administered to a large sample. It was hoped that the data generated here would not only have parallels with that uncovered in the earlier qualitative study, but would enable the researcher to build a wider picture of Economics concepts carried by students and teachers.

This chapter provides details of the qualitative-quantitative research methodology that was used in the present study.

THE QUALITATIVE PHASE

In this first phase of the study the researcher set out to:

1. select, with the assistance of Economics teachers, the terms to be used for the study;

2. select volunteer informants; and

3. gather information through interviews from the informants.

The Economics Terms Studied

Initially, it was planned to work with three urban secondary schools, one co-educational institution and two in the single-sex category. This would have provided a large sample of Economics teachers as well as Sixth and Seventh Form Economics students. Following detailed briefing, however, of the School Principals, the Heads of Economics and their teaching staff, one school declined to participate, as did one teacher in one of the remaining two schools. Consequently, the initial research sample of teachers comprised three persons (one working with Sixth Formers and two with Seventh Formers).

In subsequent meetings with the teachers, these terms were chosen:

1. Economics,
2. Price,
3. Capital, and
4. Marginal Returns.

The criteria for selecting these terms were as follows:

1. They were introduced by the teachers in Term One. This meant that it was possible to ensure that all students had been introduced to them before the interviews commenced in Term Two. It

is necessary to point out that the Sixth and Seventh Economics syllabuses are virtually the same. However, the teachers commented that in the Sixth Form, the approach was descriptive, reflecting the definitions and descriptions of Economics terms and systems. At the Seventh Form level the same topics were revisited, but from a more analytical approach such as why certain economic systems functioned in particular ways and their effects on things like the economy.

2. It was the opinion of the teachers that the four terms largely reflected the work done in Term One. It is necessary to point out that the teachers felt that the terms Economics, Price and Capital were easier to teach and more easily understood by students, while the concept of Marginal Returns was relatively difficult to teach and more difficult for students.

The Informants

The number of students taking Economics in the two schools was 33, made up of 20 Seventh Formers and 13 Sixth Formers. The researcher met with each group of Sixth and Seventh Form students, explaining to each group the purposes of the study and indicating that participation in interviews was to be on a voluntary basis. On the matter of the interviews, it was stressed that they:

1. were not tests;
2. would focus on students' personal

understanding or meaning of particular Economics terms introduced in Economics lessons;

3. would be audio-taped so that the researcher could study their statements at a later point; and

4. would be strictly confidential, including the importance of students not sharing the nature of their individual interviews with their peers.

As a result of these introductory sessions, a total of 18 students (8 Sixth Formers and 10 Seventh Formers) volunteered to participate in the interviews. However, by the time the interviews commenced two of the volunteers withdrew their original consent while two others left school to take up employment. As a result the researcher worked with 14 students made up of seven Seventh Formers and seven Sixth Formers (8 males and six females).

The teachers of the volunteer students provided confidential information on the academic ability of each student in Economics. Each volunteer student was given a code number to protect his/her identity. Four Seventh Formers, however, opted to choose their own code numbers. The investigator agreed to this as he felt this would in no way jeopardise the study. Besides, agreeing to the students' wish helped to strengthen the rapport between the researcher and the informants. The other students, however, decided to go by the codes given them by the researcher. Table 3.1 below describes the ages and academic ratings of the student subjects.

Table 3.1: Personal Data on Phase 1 Student Sample

Code	Age	Academic Rating
Sixth Formers		
601	16	Good
602	17	Very Good
603	16	Average
604	16	Average
605	17	Average
606	16	Average
607	17	Very Good
Average Age = 16.4 years		
Seventh Formers		
*007	17	Good
701	17	Average
706	17	Good
707	17	Very Good
*P03	17	Average
*P05	17	Average
*P08	19	Average
Average Age = 17.3 years		

*These codes were personally chosen by the students.

The Interviews

The interview method was used to obtain information about the meanings each student attached to the four Economics terms, namely, Economics, Price, Capital and Marginal Returns.

Each of the 14 student subjects was interviewed four times (56 interviews in all). The interviews were audio-taped and each lasted from five to 15 minutes depending upon the level of student confidence in the interview situation. The researcher and an informant normally met in the Commerce/Economics Room in each school. Depending on circumstances, two students, on average, were interviewed per day.

It was hoped initially to interview three or more students in a day. But this was never possible as many students forgot to be present at an interview, went on field trips or were absent from school. Three students were struck with influenza or some other ailment necessitating absence from school. Others simply felt that they were not in the mood to talk even though they had agreed on a time schedule the previous evening on the telephone. Because of these factors, the interviews took the whole of Term Two and a considerable part of Term Three to complete.

The interviews were held during the morning or lunch breaks so as not to deny the students their normal class sessions. The time for each interview was carefully negotiated. Each student selected the time s/he considered

favourable, and was contacted by telephone the evening before an interview to confirm a meeting, or to re-negotiate another interview if s/he would be unavailable.

In the course of the interviews, the researcher set out to gather information about the meanings each student attached to the four Economics terms. To uncover these personal meanings, the following strategy was adopted:

1. In each interview, the researcher emphasized the interest on students' personal meanings.

2. Each interview focussed on one Economics term only. The researcher asked two key questions: one, to tap the LAY perspective of their personal meanings, and the other, on how they would frame their personal meanings in a TECHNICAL sense. The Lay perspective required an informant to describe his/her personal meaning or understanding of a term in everyday language, but with the Economics meaning retained. The typical question asked was: "How would you explain your personal meaning of (PRICE) to someone with little idea about Economics using ordinary language but with the Economics meaning retained?"

In cases where students did not understand the question, rephrasings were used.

Later each student was asked to define or describe his/her personal meaning of a term using technical language, in other words, as an Economist. The typical question here was: "How

would you define (PRICE) as an Economist, that is, using the language of Economists, but from your own viewpoint?" Once again rephrasings were used when students indicated they had not properly understood the question.

The rationale for exploring both the Lay and Technical perspectives was the wish of the researcher to ensure that students did not volunteer only the meaning(s) they felt would be expected of them in a classroom or "test" situation, or which they thought the investigator would want. This approach was used to reduce as much as possible informant misinterpretation of questions which is identified as one of the shortcomings of interviews (Spradley, 1979;1980).

3. During each interview, the researcher also avoided asking questions which might predispose students to form new concepts. To avoid "leading" students, the researcher also refrained from informing students that a response was either right or wrong. Neither was any student asked to guess answers to questions. An interview was terminated, therefore, if a student indicated s/he had no idea about a question or term.

4. Students were not informed about the concept that was to be discussed in each session. This was to ensure that they would not consult their textbooks, notes, their teachers or other students as if preparing for a test. Moreover, each

student was requested not to divulge the contents of an interview to any other third party, especially to other students taking part in the interviews.

THE QUALI-QUANTITATIVE PHASE

As discussed earlier, it was proposed in the present study to extend the qualitative phase by following research with a large sample of Economics students and teachers from the same divisions of the secondary school. This involved the use of a survey-type questionnaire which would provide both quantitative and qualitative data. The content of the survey questionnaire was to be based directly on the meanings about Economics terms that had emerged from the qualitative phase of the study involving the small group. In other words, rather than make a priori assumptions about what should or should not be included in the survey, it was decided that the survey should deal with all the data that were obtained in the qualitative phase. Although it was not possible to interview everyone, it was important that the survey incorporated some kind of opportunity to enable respondents to express their personal ideas or meanings not included in the questionnaire.

Analysis of the Interview Data

The researcher transcribed the interviews and analyzed the transcripts to identify the themes or key concepts of the students' meanings of the four terms from both the lay and technical statements.

The first step was to study the lay and technical statements. It was noticed that, both the lay and technical statements were very similar, as evidenced by P08's (a Seventh Former) statements below on the meaning of Capital:

Lay Statement

> Capital is money or bonds, things like that; or what a person borrows from the bank to get his business started, or his returns from selling his goods or interest. Anything, just the money side of the business.

Technical Statement

> What a producer can use to hold his business and produce his goods. Just to have that capital buy his resources, get his business going. And this can be repaid with the money he raises for selling his goods. If the producer can get his money, his capital, he can buy bigger buildings, better sites, faster trucks, more efficient machines and things like that. (See Appendix 1 for the Transcripts of the Interviews)

The second step was to reduce the student sample's meanings about each term into themes or key concepts. For instance, P08's meaning of capital was reduced to four themes or key concepts. These were Capital as:

1. Money;
2. Bonds;
3. Money borrowed from banks to get business started; and
4. Money to buy resources for business.

All the themes from students' meanings about a term were grouped together and analysed again to identify similarities among themes as well as their unique qualities. From this a common group of themes about a term was evolved.

In all, 50 themes were obtained from the analysis of

the transcripts. These were made up of:

1. 13 themes about Economics;
2. 9 themes about Price;
3. 16 themes about Capital; and
4. 12 themes about Marginal Returns.

The Questionnaires

The themes referred to above were used to prepare a four-part questionnaire, with each part reflecting each term. (See Figures 3.1, 3.2, 3.3 and 3.4).

Each part of a questionnaire had two sections. In Section A, each theme (or item) was accompanied by a 7-point scale, ranging from "1" (Completely Disagree) to "7" (Completely Agree) by which a respondent could indicate his/her level of agreement with a theme. This, of course, was not necessarily the same thing as his or her actual meaning for each theme. Rather, it was a measure of the level of agreement with a given conceptualization of the general meaning of a term. It was possible, therefore, that a respondent might not even include a given theme in his/her personal meaning for a concept though s/he agreed with it.

In Section B, the respondent was required to, (a) provide a picture of his/her meaning of a term by using the themes in Section A, and/or (b) indicate other ideas or meanings s/he might have about a term but which were not included in Section A. A third part in Section B was reserved for Economics teachers who were also asked to complete questionnaires. They were required to state how

THE MEANING OF ECONOMICS

Please complete: Class..... Age.....

(For teachers: please indicate class you teach:.....

A.1. When a large group of students was asked what they understood by the term "ECONOMICS", they gave a variety of answers.

2. Below you will find a list of the various answers they gave.

3. Take each of the statements below and indicate by a rating ranging from "7" to "1" how much you agree or disagree with each statement.

N.B.: 1. The rating "7" means you completely agree with the statement while "1" means you completely disagree. Ratings in-between show how closely you agree or disagree with a statement. For example a rating of "6" means you almost completely agree and "2" almost completely disagree. Please indicate your rating by crossing with an "X".

2. THIS IS NOT A TEST. IT IS SIMPLY A MEANS BY WHICH WE CAN GAIN AN UNDERSTANDING OF YOUR PERSONAL MEANING OF THE TERM "ECONOMICS".

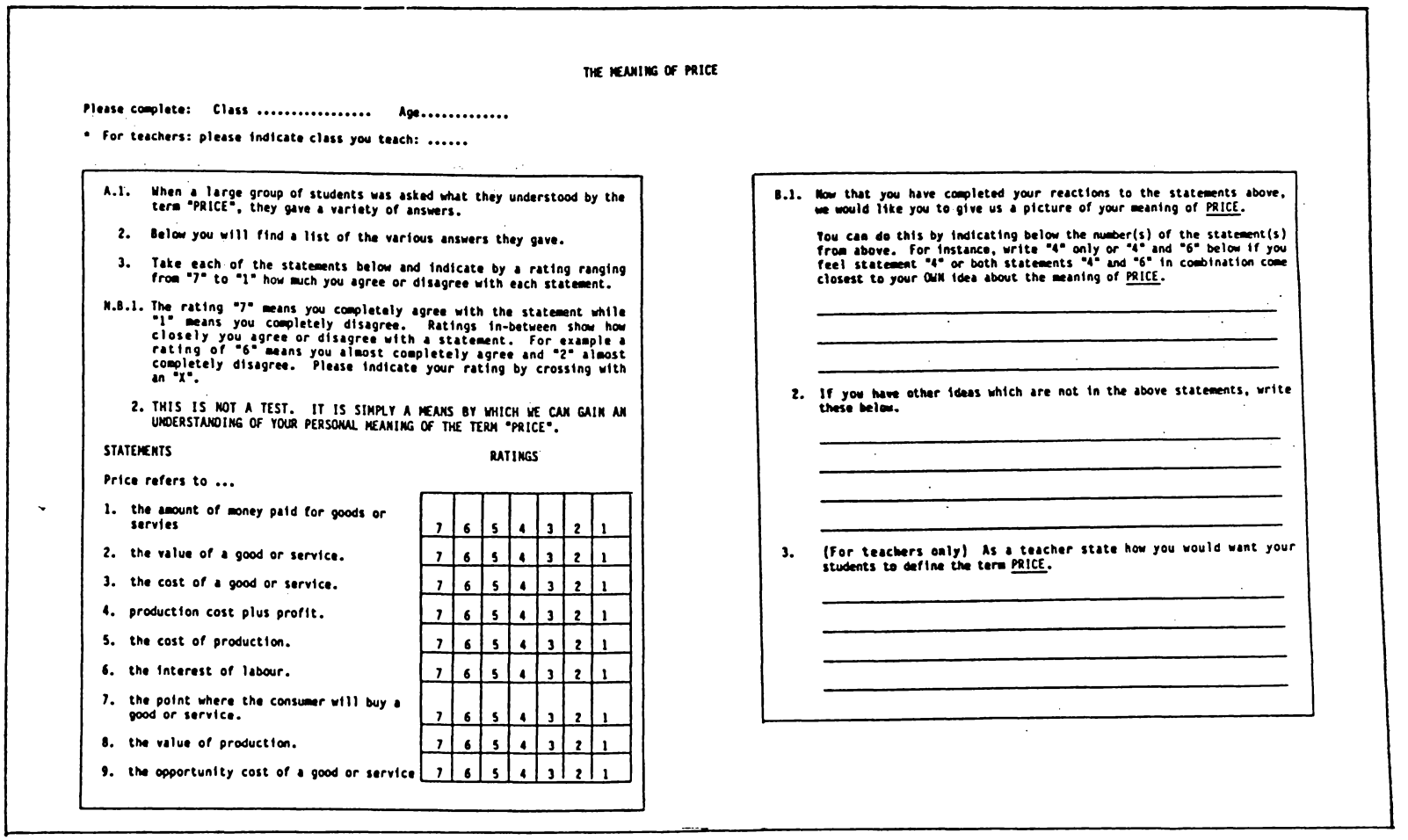
STATEMENTS	RATINGS						
Economics refers to -							
1. money	7	6	5	4	3	2	1
2. the study of politics	7	6	5	4	3	2	1
3. the study of business	7	6	5	4	3	2	1
4. the use of resources	7	6	5	4	3	2	1
5. how man works in his environment	7	6	5	4	3	2	1
6. the production of goods and services ..	7	6	5	4	3	2	1
7. the study of scarcity	7	6	5	4	3	2	1
8. the study of how man makes a living	7	6	5	4	3	2	1
9. unlimited resources	7	6	5	4	3	2	1
10. the study of choice	7	6	5	4	3	2	1
11. the nature of unlimited wants	7	6	5	4	3	2	1
12. the study of how man reacts to changes ..	7	6	5	4	3	2	1
13. the study of human behaviour	7	6	5	4	3	2	1

B.1. Now that you have completed your reactions to the statements above, we would like you to give us a picture of your meaning of ECONOMICS. You can do this putting down below the statement or statements from above. For instance, put "4" and "6" below if you feel these two statements come closest to your OWN idea about the meaning of ECONOMICS.

2. If you have other ideas which are not in the above statements, write these below.

3. (For teachers only) As a teacher state how you would want your students to define the term ECONOMICS.

Figure 3.1: The Questionnaire on Economics



THE MEANING OF PRICE

Please complete: Class ..... Age.....

* For teachers: please indicate class you teach: .....

A.1. When a large group of students was asked what they understood by the term "PRICE", they gave a variety of answers.

2. Below you will find a list of the various answers they gave.

3. Take each of the statements below and indicate by a rating ranging from "7" to "1" how much you agree or disagree with each statement.

N.B.1. The rating "7" means you completely agree with the statement while "1" means you completely disagree. Ratings in-between show how closely you agree or disagree with a statement. For example a rating of "6" means you almost completely agree and "2" almost completely disagree. Please indicate your rating by crossing with an "X".

2. THIS IS NOT A TEST. IT IS SIMPLY A MEANS BY WHICH WE CAN GAIN AN UNDERSTANDING OF YOUR PERSONAL MEANING OF THE TERM "PRICE".

STATEMENTS	RATINGS						
Price refers to ...							
1. the amount of money paid for goods or servies	7	6	5	4	3	2	1
2. the value of a good or service.	7	6	5	4	3	2	1
3. the cost of a good or service.	7	6	5	4	3	2	1
4. production cost plus profit.	7	6	5	4	3	2	1
5. the cost of production.	7	6	5	4	3	2	1
6. the interest of labour.	7	6	5	4	3	2	1
7. the point where the consumer will buy a good or service.	7	6	5	4	3	2	1
8. the value of production.	7	6	5	4	3	2	1
9. the opportunity cost of a good or service	7	6	5	4	3	2	1

B.1. Now that you have completed your reactions to the statements above, we would like you to give us a picture of your meaning of PRICE.

You can do this by indicating below the number(s) of the statement(s) from above. For instance, write "4" only or "4" and "6" below if you feel statement "4" or both statements "4" and "6" in combination come closest to your OWN idea about the meaning of PRICE.

2. If you have other ideas which are not in the above statements, write these below.

3. (For teachers only) As a teacher state how you would want your students to define the term PRICE.

Figure 3.2: The Questionnaire on Price

THE MEANING OF CAPITAL

Please complete: Class ..... Age .....

* For teachers: please indicate class you teach: .....

A.1. When a large group of students was asked what they understood by the term "CAPITAL" they gave a variety of answers.

2. Below you will find a list of the various answers they gave.

3. Take each of the statements below and indicate by a rating ranging from "7" to "1" how much you agree or disagree with each statement.

N.B. 1. The rating "7" means you completely agree with the statement while "1" means you completely disagree. Ratings in-between show how closely you agree or disagree with a statement. For example a rating of "6" means you almost completely agree and "2" almost completely disagree. Please indicate your rating by crossing with an "X".

2. THIS IS NOT A TEST. IT IS SIMPLY A MEANS BY WHICH WE CAN GAIN AN UNDERSTANDING OF YOUR PERSONAL MEANING OF THE TERM "CAPITAL".

STATEMENTS

Capital refers to -

1. Money	7	6	5	4	3	2	1
2. bonds	7	6	5	4	3	2	1
3. money borrowed from banks to get business started i.e. finance.	7	6	5	4	3	2	1
4. something used to produce goods ..	7	6	5	4	3	2	1
5. money to buy resources and pay for labour	7	6	5	4	3	2	1
6. machinery	7	6	5	4	3	2	1
7. goods that produce other goods... ..	7	6	5	4	3	2	1
8. buildings	7	6	5	4	3	2	1
9. man-made goods used in factories ..	7	6	5	4	3	2	1
10. machines and factories	7		5	4	3	2	1
11. man-made products used to make products	7	6	5	4	3	2	1
12. the wage or money value of the factors of production.	7	6	5	4	3	2	1
13. things already produced.	7	6	5	4	3	2	1
14. longterm fixed asset	7	6	5	4	3	2	1
15. assets	7	6	5	4	3	2	1
16. investment	7	6	5	4	3	2	1

B.1. Now that you have completed your reactions to the statements above, we would like you to give us a picture of your meaning of CAPITAL. You can do this by indicating below the number(s) of the statement(s) from above. For instance, write "4" only or "4" and "6" below if you feel statement "4" or both statements "4" and "6" in combination come closest to your OWN idea about the meaning of CAPITAL.

_____

_____

_____

2. If you have other ideas which are not in the above statements, write these below.

_____

_____

_____

_____

3. (For teachers only) As a teacher state how you would want your students to define the term CAPITAL.

_____

_____

_____

_____

Figure 3.3: The Questionnaire on Capital

THE MEANING OF MARGINAL RETURN

Please complete: Class..... Age.....

• For teachers: please indicate class you teach.....

A.1. When a large group of students was asked what they understood by the term "MARGINAL RETURN" they gave a variety of answers.

2. Below you will find a list of the various answers they gave.

3. Take each of the statements below and indicate by a rating ranging from "7" to "1" how much you agree or disagree with each statement.

N.B.1. The rating "7" means you completely agree with the statement while "1" means you completely disagree. Ratings in-between show how closely you agree or disagree with a statement. For example a rating of "6" means you almost completely agree and "2" almost completely disagree. Please indicate your rating by crossing with an "X".

2. THIS IS NOT A TEST. IT IS SIMPLY A MEANS BY WHICH WE CAN GAIN AN UNDERSTANDING OF YOUR PERSONAL MEANING OF THE TERM "MARGINAL RETURN".

STATEMENTS	RATINGS						
Marginal return refers to ...							
1. making a profit	7	6	5	4	3	2	1
2. breaking even.	7	6	5	4	3	2	1
3. the limit to production	7	6	5	4	3	2	1
4. the extra production	7	6	5	4	3	2	1
5. the increase in production	7	6	5	4	3	2	1
6. the increase in the factor of production	7	6	5	4	3	2	1
7. the decrease in the factor of production	7	6	5	4	3	2	1
8. the difference between two stages of production	7	6	5	4	3	2	1
9. the income from investment	7	6	5	4	3	2	1
10. the decrease in production	7	6	5	4	3	2	1
11. total production	7	6	5	4	3	2	1
12. the fixed factor of production	7	6	5	4	3	2	1

B.1. Now that you have completed your reactions to the statements above, we would like you to give us a picture of your meaning of MARGINAL RETURN. You can do this by indicating below the numbers(s) of the statement(s) from above. For instance, write "4" only or "4" and "6" below if you feel statement "4" or both statements "4" and "6" in combination come closest to your OWN idea about the meaning of MARGINAL RETURN.

_____

_____

_____

2. If you have other ideas which are not in the above statements, write these below.

_____

_____

_____

_____

3. (For teachers only) As a teacher state how you would want your students to define the term MARGINAL RETURN.

_____

_____

_____

_____

Figure 3.4: The Questionnaire on Marginal Returns

they would want their students to define a term. This was also meant to act as a cross-reference to the first two parts of Section B in the case of the teachers.

A pilot study of the questionnaires was carried out with 10 Sixth and Seventh Formers and their Economics teacher in a school not included in the large sample. This move offered the researcher the opportunity to reshape the questionnaires if necessary. As it happened, no major alterations needed to be made.

The Subjects

Letters were sent to 52 secondary schools in the Waikato Education District, inviting Sixth and Seventh Form Students and their teachers who were involved in Economics to respond to the researcher's four-part questionnaire survey. Of the 52 schools, 42 indicated their willingness to participate. This produced a potential survey sample of 1562 students (made up of 1185 Sixth Formers and 377 Seventh Formers) and 84 teachers of Economics.

Subsequently, 1646 individual four-part questionnaires were mailed to consenting schools. Guidelines were sent to each of the teachers who would handle the administration of the questionnaires, as well as respond to it. Teachers were asked to ensure that students:

(a) did not refer to their textbooks or class notes when completing the questionnaires;

(b) completed the questionnaires in the teacher's presence; and

(c) did not confer among themselves during the questionnaire-answering session. The researcher's concern, of course, was that students should indicate their personal thoughts.

Out of the 42 schools, 28 or 66.7 per cent, returned a set of completed questionnaires. This meant, therefore, 639 subjects in all: 35 teachers and 604 students. The teacher group included 14 teaching in Sixth Forms and 21 working with Seventh Forms. However, 16 of the Seventh Form teachers also indicated that they occasionally taught Sixth Form classes. It seemed, therefore, that most of the teachers could teach at either Form level as suggested also by the teachers interviewed during Phase 1 of the study.

Unfortunately, of the 604 student sample, it was the Seventh Form group which had a poorer return (178 out of 228 potential subjects, or 78.1 per cent). In the case of the Sixth Form Sample, there were 426 returns out of 466 students, or a return of 91.4 per cent.

The mean age of the 426 Sixth Form Sample was 16.4 years while that of the 178 Seventh Formers was 17.2 years. Compare with the average ages of the Phase 1 student sample.

Analysis Procedures

The data derived from the questionnaires were analysed using the SPSS-X (1983). This provided cross-tabulated information on the extent of respondents' agreement levels with themes in Section A of the questionnaires, as well as

the frequencies of themes included by respondents as part of their personal meaning responses in Section B.

In addition, the researcher systematically examined all responses to each Economics term in Section B in order to record individual meanings, teachers' definitions and additional themes offered by respondents but not stated in Section A. The frequencies of these additional themes included by respondents as part of their personal meaning responses in Section B were computed. The meanings in each group of students and teachers were examined to identify the extent that meanings were similar or unique, and their relationships with those of Economists.

The report of the study included both qualitative and quantitative features since the research made use of both methods. It should be made clear that the purpose of the study was not to determine the "scientific" meanings of Economics concepts. Rather, it was a study investigating the nature of the meanings that students and their teachers had for the Economics concepts studied.

CHAPTER FOUR

RESULTS AND DISCUSSION

As outlined in Chapter Three, the initial stages of the present study consisted of detailed discussion with a small sample of teachers, as well as Sixth and Seventh Form students, to identify key concepts or themes in the study of Economics. This qualitatively orientated beginning to the study resulted in the selection of four Economics terms: Economics, Price, Capital and Marginal Returns. Subsequently, in-depth interviewing of a small sample of students sought to uncover the personal meanings and themes inherent in the meanings which this sample had for the concept of concern. This further research of a qualitative nature provided the basis for a subsequent survey questionnaire which provided a quantitative as well as qualitative picture of the views of a much larger sample of students and teachers concerning the same four concepts.

The present chapter presents the results of implementing the procedures outlined above. The results are organised in four main sections, each of which refers to one of the terms or concepts on which the research came to focus. For each term, the meanings of both students and teachers are presented and discussed with reference to both the initial qualitative and subsequent survey phases of the

study. Each section concludes with a comparative analysis of teacher and student meanings.

THE MEANING OF ECONOMICS

The Thematic Conceptualizations of Economics

Appendix 1 provides transcripts of the interviews conducted with the 14 student sample in Phase 1 of the research. Analysis of these transcripts revealed thirteen themes or personal conceptualizations of the term Economics (See Figure 4.1).

Economics seen as:

1. Money
2. Politics
3. Business
4. Use of Resources
5. Man Working in Environment
6. Production of Goods
7. Scarce Resources
8. Man Making a Living
9. Unlimited Resources
10. Choice
11. Unlimited Wants
12. Reactions of Man to Changes
13. Human Behaviour

Figure 4.1: Themes of Economics in Phase 1 of Study

Of these, the predominant meanings and themes of Economics involved the idea of money, scarce resources and production of goods and services as indicated in the following statements:

> Economics is the way that any person would use his money to the greatest ability to get satisfaction out of his money (P08 - A Seventh Former).

> Basically it's the way money is; what they do with it in business, what government does with it and profit and loss. Overseas, how countries sort of export and import. Just basically the money system. Money flow within a country. Sources of money, usage and spending of money. (602 - A Sixth Former).

> It's a social science. How people use the resources that's available to them and organise themselves. The resources are limited so they've got to choose how to use them to produce things. (604 - A Sixth Former).

> I'll explain Economics to be how people use resources, both limited and unlimited, to produce goods and services to meet their unlimited wants. (007 - A Seventh Former).

It will be noted that the theme Money is very explicit in the first two statements, while the themes Scarce Resources and Production of Goods and Services are prominent in the last two statements. It will also be noted that Student 007's meaning of resources includes both limited and unlimited resources while Student 604's meaning is that of a situation of limited resources. Student 007 was the only one to refer to the idea of both "limited and unlimited" resources. It appeared Student 007 did not share the idea of the definitions of Economics being viewed mostly from the idea of scarce resources. Without being asked for any

explanation, Student 007 indicated, perhaps as a justification of the personal definition given:

> You know, the Arabs desalinate the sea to produce water and electricity. The sea, as far as I'm concerned is unlimited. There will always be the sea, air and water. Oil may likely be used up in the Arab countries but there'll always be the sea. (007).

The themes Politics and Business which were considerably used, tended to be related with money as indicated by the statements below:

> The money system and what we use as exchange rate; how money is circulated in the economy, like business and how people pay for goods and services; how money can buy goods and services and then, you know, how the government turns out the money. (P05 - A Seventh Former).
>
> It's a study of what goes on in the world - money and business administration and politics. (P03 - A Seventh Former).
>
> Basically it's the way money is; what they do with it in business, what government does with it ...(602 - A Sixth Former).

As indicated in the previous chapter, students were asked to give a lay and a technical description of their meanings for each term. The lay descriptions tended to be very similar to the technical ones, with the latter being used mostly to summarise the former as evidenced by the statements of Student 604:

> Lay:
>
> It's a social science. How people use the resources that's available to them and organise themselves. The resources are limited so they've got to choose how to use them to produce things.

Technical:

> It's the production of goods and services using scarce or limited resources. (604 - A Sixth Former).

This lack of differentiation between lay and technical descriptions of the Economics concept was also noticed in the terms Price, Capital and Marginal Returns. In some cases students indicated their difficulties in giving a technical definition:

> The theory of how a country runs and the practices people use in running it. It's difficult for me to define. (603 - A Sixth Former).

Others indicated that their technical definitions were the same as the lay meanings:

> Ah, much the same as I said before, as how society interacts and probably also some of the reasons as to how they use the resources available to them. (601 - A Sixth Former).

The Results of the Survey on the Term Economics

Reactions to the 13 Themes: Table 4.1 summarises the results of asking a large sample of Sixth and Seventh Form Students, as well as their teachers, to indicate their levels of agreement with each of the 13 conceptualizations identified in Phase 1 of the research with respect to the term Economics. A rating of 7 signified complete agreement with an idea while a rating of 1 signified complete disagreement. For each theme, Table 4.1 provides the percentages of student and teacher samples that fell into each category 7 to 1, as well as the means and standard deviations with reference to the 7 to 1 scale.

Across both Sixth and Seventh Form student groups,

Table 4.1: Indications of Levels of Agreement with Themes of the Term Economics

(In Percentages)

THEMES			7	6	5	4	3	2	1	Mean	S.D.
1. MONEY	6th F	Students	6.1	9.6	21.4	24.7	19.8	11.8	6.6	3.96	8.60
	7th F	Students	3.9	10.1	18.0	22.5	25.3	14.0	6.2	2.88	5.60
	6th F	Teachers	7.7		23.1	15.4	23.1	23.1	7.7	3.53	3.60
	7th F	Teachers	5.3		15.8	21.1	10.5	31.6	15.8	3.10	1.71
2. POLITICS	6th F	Students	1.4	2.8	6.8	16.0	20.9	27.2	24.9	2.67	9.42
	7th F	Students	0.6	0.6	4.5	13.5	22.5	30.9	27.5	2.40	6.48
	6th F	Teachers				15.4	23.1	15.4	46.2	2.07	1.70
	7th F	Teachers		5.3			15.8	31.6	47.4	1.89	2.38
3. BUSINESS	6th F	Students	3.5	15.5	27.2	25.6	17.6	7.7	2.8	4.27	9.24
	7th F	Students	5.6	14.0	24.2	31.5	15.2	7.3	2.2	4.32	6.02
	6th F	Teachers	15.4		15.4	7.7	38.5	15.4	7.7	3.69	1.41
	7th F	Teachers			5.3	15.8	36.8	31.6	10.5	2.73	2.05
4. USE OF RESOURCES	6th F	Students	24.9	31.0	22.1	12.0	6.1	2.3	1.6	5.43	9.74
	7th F	Students	29.2	33.1	17.4	10.7	3.9	4.5	1.1	5.55	6.45
	6th F	Teachers	53.8	30.8	15.4					6.38	2.06
	7th F	Teachers	47.4	31.6	15.8	5.3				6.21	2.38
5. WORK IN ENVIRONMENT	6th F	Students	4.5	11.3	16.9	20.0	22.4	17.6	7.3	3.73	8.43
	7th F	Students	1.7	9.0	14.6	20.8	18.5	25.3	10.1	3.38	5.59
	6th F	Teachers	23.1	15.4	15.4	15.4	23.1	7.7		4.77	1.18
	7th F	Teachers	5.3	5.3	31.6	10.5	21.1	15.8	10.5	3.74	1.65
6. PRODUCTION OF GOODS/SERVICES	6th F	Students	17.4	30.8	27.5	17.6	3.8	2.6	0.5	6.52	9.91
	7th F	Students	19.7	25.8	26.4	17.4	7.9	2.2	0.6	5.23	6.06
	6th F	Teachers	30.8		38.5	30.8				5.30	1.84
	7th F	Teachers	15.8	36.8	26.3	10.5		10.5		5.26	4.36
7. SCARCE RESOURCES	6th F	Students	19.5	21.8	25.1	16.4	9.9	5.9	1.4	4.36	8.92
	7th F	Students	33.9	36.2	12.4	11.3	5.1		1.1	5.78	6.92
	6th F	Teachers	76.9	15.4	7.7					6.69	2.66
	7th F	Teachers	68.4	26.3		5.3				6.58	5.20

			7	6	5	4	3	2	1		
8. MAKE A LIVING	6th F	Students	5.2	9.2	13.6	22.8	24.2	16.9	8.0	3.73	7.24
	7th F	Students	2.2	6.7	14.6	18.0	27.0	22.5	9.0	3.36	5.72
	6th F	Teachers	7.7	15.4	7.7	23.1	15.4	23.1	7.7	3.76	1.23
	7th F	Teachers		10.5	31.6	15.8	31.6	10.5		4.00	1.91
9. UNLIMITED RESOURCES	6th F	Students	3.5	6.1	7.0	15.3	13.8	20.2	34.0	2.73	9.38
	7th F	Students	0.6	6.7	10.1	7.3	9.0	20.2	46.1	2.08	7.01
	6th F	Teachers	7.7	7.7					84.6	1.85	2.91
	7th F	Teachers	5.3					10.5	84.2	1.42	3.57
10. CHOICE	6th F	Students	17.4	23.8	17.4	18.8	11.8	7.1	3.8	4.80	8.51
	7th F	Students	21.9	30.9	21.9	14.0	6.7	4.5		5.33	6.15
	6th F	Teachers	84.6	7.7	7.7					6.77	2.91
	7th F	Teachers	63.2	15.8	5.3	5.3	5.3		5.3	6.00	2.69
11. UNLIMITED WANTS	6th F	Students	6.4	13.2	15.8	21.4	18.1	15.8	9.4	3.83	8.15
	7th F	Students	8.4	17.4	20.2	18.5	16.9	10.1	8.4	4.18	5.22
	6th F	Teachers	38.5	15.4		38.5			7.7	5.69	1.80
	7th F	Teachers	5.3	21.1	21.1	21.1	15.8	10.5	5.3	4.26	2.36
12. REACTIONS TO CHANGES	6th F	Students	2.6	4.5	8.5	17.2	20.7	25.2	21.4	2.90	8.96
	7th F	Students	0.6	2.8	9.6	18.0	25.8	23.6	19.7	2.85	5.93
	6th F	Teachers		15.4	23.1	7.7	7.7	38.5	7.7	3.46	3.14
	7th F	Teachers		5.3	10.5	10.5	15.8	47.4	10.5	2.79	1.34
13. HUMAN BEHAVIOUR	6th F	Students	12.2	9.4	10.8	10.3	9.2	19.7	28.4	3.32	8.55
	7th F	Students	2.2	10.7	13.5	14.0	20.2	20.2	19.1	3.23	5.38
	6th F	Teachers	15.4	7.7	30.8	7.7	23.1	7.7	7.7	4.30	1.24
	7th F	Teachers	5.3	10.5	15.8	26.3	10.5	21.1	10.5	3.68	1.52

Note: 7 = Completely Agree; 1 = Completely Disagree

(N : 6th Form Students = 426; 7th Form Students = 178; 6th Form Teachers = 14; 7th Form Teachers = 21)

there were high agreement levels for the themes Use of Resources ($\bar{X}$ = 5.43, SD = 9.74 and $\bar{X}$ = 5.55, SD = 6.45 respectively) and Production of Goods and Services ($\bar{X}$ = 6.52, SD = 9.91 and $\bar{X}$ = 5.23 , SD = 6.06 respectively). In addition the Seventh Form students' agreement levels were also high for the themes Scarce Resources ($\bar{X}$ = 5.78, SD = 6.92) and Choice ($\bar{X}$ = 5.33, SD = 6.15). The themes that received low agreement levels among the students were Politics ($\bar{X}$ = 2.67, SD = 9.42 for the Sixth Formers and $\bar{X}$ = 2.40, SD = 6.48 for the Seventh Formers), Reactions to Changes ($\bar{X}$ = 2.90, SD = 8.96 and $\bar{X}$ = 2.85, SD = 5.93 respectively) and Unlimited Resources ($\bar{X}$ = 2.73, SD = 9.38 and $\bar{X}$ = 2.08, SD = 7.01 respectively) with almost half of the Seventh Formers (46.1 per cent) completely disagreeing with the last theme. The theme Money also received a low agreement level with the Seventh Formers ($\bar{X}$ = 2.,88, SD = 5.60).

Among the teachers the themes that received high agreement levels included Use of Resources ($\bar{X}$ = 6.38, SD = 2.06 for Sixth Form Teachers and $\bar{X}$ = 6.21, SD = 2.38 for Seventh Form Teachers), Production of Goods and Services ($\bar{X}$ = 5.30, SD = 1.84 and $\bar{X}$ = 5.26, SD = 4.36 respectively), Scarce Resources ($\bar{X}$ = 6.69, SD = 2.66 and $\bar{X}$ = 6.58, SD = 5.20 respectively) and Choice ($\bar{X}$ = 6.77, SD = 2.91 and X = 6.00, SD = 2.69 respectively). About half of the Sixth Form Teachers (53.8 per cent) and nearly half of the Seventh Form Teachers (47.4 per cent) completely agreed with the theme Use of Resources. Over two-thirds of both groups completely

agreed with the theme Scarce Resources (76.9 per cent and 68.4 per cent respectively). Moreover, almost all the Sixth Form Teachers (84.6 per cent) completely agreed with the theme Choice while about two-thirds of the Seventh Form Teachers (63.2 per cent) did so. In addition, there was a high agreement level for the theme Unlimited Wants among the Sixth Form Teachers ($\bar{X}$ = 5.69, SD = 1.80).

The themes that received a low agreement level among the teachers were Politics ($\bar{X}$ = 2.07, SD = 1.70 for the Sixth Form Teachers and $\bar{X}$ = 1.89, SD = 2.38 for the Seventh Form Teachers) and Unlimited Resources ($\bar{X}$ = 1.85, SD = 2.91 and $\bar{X}$ = 1.42, SD = 3.57) respectively. Almost half of the teachers completely disagreed with the theme Politics (46.2 per cent and 47.4 per cent respectively) while almost all of them did so for the theme Unlimited Resources (84.6 per cent and 84.2 per cent respectively). In addition, the themes Business and Reactions to Changes received low levels of agreement among the Seventh Form Teachers ($\bar{X}$ = 2.73 , SD = 2.05 and $\bar{X}$ = 2.79 SD = 1.34 respectively).

It will be seen from the results that both student and teacher levels of agreement were high for the themes Use of Resources and Production of Goods and Services, and low for the themes Politics and Unlimited Resources.

Students' Personal Meanings for the term Economics:

The opportunity given students to provide their personal meanings for the term Economics in Sections B1 and B2 of the questionnaire saw the emergence of an additional 10 themes

	Themes From Part A of the Questionnaire
(1)	Money
(2)	Politics
(3)	Business
(4)	Use of Resources
(5)	Man Working in Environment
(6)	Production of Goods and Services
(7)	Scarce Resources
(8)	Man Making a Living
(9)	Unlimited Resources
(10)	Choice
(11)	Unlimited Wants
(12)	Reactions of Man to Changes
(13)	Human Behaviour
	Additional Themes From Part B
(14)	Distribution of Goods and Services
(15)	Consumption of Goods and Services
(16)	Satisfaction of Wants
(17)	Best utilization of All Resources
(18)	Utmost Production
(19)	Least Waste, Time and Cost
(20)	Optimum Social Cost
(21)	Opportunity Cost
(22)	Difficulty of Making a Living
(23)	Saving of Resources for Future Use

Figure 4.2:Themes of Economics from Parts A and B of Questionnaire

to the 13 already derived from Phase 1 of the study. In the analysis of the results presented in Figure 4.2, the bracketed numbers refer to these 23 themes - the 13 in Part A of the questionnaire, and the 10 additional themes from Part B. Both the Sixth and Seventh Form student groups offered a wide range of themes reflecting their personal conceptions of the term Economics. Sixth Formers' responses indicated a range of 22 themes (1-22), while that of Seventh Formers covered 21 themes (1-19, 21 and 23).

Concerning the combinations of particular themes to describe the meaning of a term, that is, the "meaning combination" a student gave for the term Economics, or sometimes only a theme to represent a meaning, an analysis revealed that Sixth Formers presented 228 different patterns in toto. Of these 62 were shared by 61.3 per cent (n=261), or an average of one pattern per four students. This meant, therefore, that 38.7 per cent of the Sixth Formers (n = 165) presented unique meanings or meaning combinations (see Appendix 2A). In the case of the Seventh Formers, 120 different patterns were offered altogether of which 23 were shared by 45.5 per cent (n = 81) of the students, or an average of one meaning per three students, while 54.5 per cent (n = 96) were unique (see Appendix 2A).

Table 4.2 summarizes the picture of shared meanings or combinations of meanings for both the Sixth and Seventh Form student groups. As this Table shows, among both the Sixth and Seventh Formers, no one meaning or thematic combination enjoyed a high degree of shared agreement. The highest

Table 4.2 : Per centage of Students' Shared Meanings of Economics

Sixth Form (Total Shared Meanings = 62)

Meaning	Rate(%)
7,10	3.9
4,6	3.5
4,7,10	3.0
1,3,6	2.1
4,6,7,10	2.1
6,7	1.9
1,6	1.6
3,4,6	1.6
4,7	1.6
3,6	1.4
4,7,11	1.4
4,10	1.4
4,13	1.4
7,10,11	1.4
1,3,4,6	1.1
1,4,6	1.1
3,4,6,10	1.1
4,6,10	1.1
4,6,11	1.1
6	1.1
1,3	1.0
4,6,7,10,13	1.0
6,7,10	1.0
1,4,7	0.7
4,5	0.7
4,6,7	0.7
4,6,13	0.7
6,10,13	0.7
7,10,13	0.7
8,13	0.7
10,13	0.7
12,13	0.7
1,3,4	0.5
1,2,3	0.5
1,4,13	0.5
1,4,6,7,10	0.5
1,4,6,7,11	0.5
1,6,7,10	0.5
3,4	0.5
3,4,6,7	0.5
3,4,6,11	0.5
4	0.5
4,5,6	0.5
4,6,8	0.5
4,6,14	0.5
4,6,7,11	0.5
4,6,7,10,11	0.5
4,6,11,13	0.5
4,7,10,11	0.5
4,11	0.5
4,7,10,16	0.5
4,7,13	0.5
4,10,16	0.5
5,6	0.5
5,8,13	0.5
6,10	0.5
6,8,13	0.5
7,10,14	0.5
7,10,16	0.6
7,11	0.5

Seventh Form (Total of Shared Meanings = 23)

Meaning	Rate(%)
4,7,10	6.7
7,10	5.6
4,7	4.5
4,6,7	2,2
4,7,10,11	2.2
6,7,10	2.2
1,6,7	1.7
4,6	1.7
4,7,11	1.7
7,13	1.7
1,4,6	1.1
1,4,6,10	1.1
4,5,6	1.1
4,5,7	1.1
4,5,6,7,10	1.1
4,6,14	1.1
4,6,7,10,11	1.1
4,7,10,13	1.1
6,7,10,13	1.1
6,7,11	1.1
7,10,11	1.1
7,10,13	1.1
7,11	1.1

Key to Themes

1. Money
2. Politics
3. Business
4. Use of Resources
5. How Man Works in Environment
6. Production of Goods/Services
7. Scarce Resources
8. How Man Makes a Living
10. Choice
11. Unlimited Wants
13. Human Behaviour
14. Distribution of Goods/Services
16. Satisfaction of Wants

shared thematic combinations did not reach a four per cent rating in the case of Sixth Formers. These patterns were:

1. 3.9 per cent - (7, 10) Scarce Resources and Choice;
2. 3.5 per cent - (4, 6) Use of Resources and Production of Goods and Services; and
3. 3.0 per cent - (4, 7, 10) Use of Resources, Scarce Resources and Choice.

Among the Seventh Formers, the highest shared combinations of themes did not reach a 7 per cent rating. The patterns were:

1. 6.7 per cent - (4, 7, 10) Use of Resources, Scarce Resources and Choice;
2. 5.6 per cent - (7, 10) Scarce Resources and Choice; and
3. 4.5 per cent - (4, 7) Use of Resources and Scarce Resources.

Table 4.3 summarises the rate at which themes were included in the personal meanings of students (and also the teachers). It will be seen that over half of both student groups included the themes Use of Resources in their personal meanings, while about half also included the theme Production of Goods and Services. However, over two-thirds of Seventh Formers included the theme Scarce Resources in their personal meanings as against less than half of the Sixth Formers. In addition, over half of the Seventh Formers included Choice in their meanings as against about

Table 4.3 : Percentages of Themes of Economics Included in Personal Meanings of Economics

THEMES →	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Sixth Formers	19.3	4.9	21.1	57.5	9.6	52.1	43.7	3.7	5.4	39.7	18.5	4.5	18.5	4.5	1.2	5.2	1.9	0.2	0.5	0.2	0.9	0.5	0
Sixth Form Teachers	7.1	0	0	64.3	0	14.3	10.0	0	0	92.9	42.9	0	14.3	7.1	0	7.1	0	0	0	0	0	0	0
Seventh Formers	13.5	2.8	16.9	60.1	7.9	46.6	72.5	9.6	6.2	55.6	24.2	4.5	12.4	8.9	0.6	2.2	3.4	0.6	0.6	0	0.6	0	0.6
Seventh Form Teachers	0	4.8	0	52.4	4.8	38.1	90.5	0	4.8	76.2	52.4	0	9.5	23.8	4.8	9.5	0	0	0	0	4.8	0	0

N - 6th Formers = 426 7th Formers = 178 Sixth Form Teachers = 14 Seventh Form Teachers = 21

Key to Themes

1. Money
2. Politics
3. Business
4. Use of Resources
5. How Man Works in Environment
6. Production of Goods and Services
7. Scarcity
8. How Man Makes a Living
9. Unlimited Resources
10. Choice
11. Unlimited Wants
12. How Man Reacts to Changes
13. Human Behaviour
14. Distribution of Goods and Services
15. Consumption of Goods and Services
16. Satisfaction of Wants
17. Best Utilization of All Resources
18. Utmost Production
19. Least Waste, Time and Cost
20. Optimum Social Cost
21. Opportunity Cost
22. Difficulty of Making a Living
23. Saving of Resources for Future Use

one-third of Sixth Formers for the same theme.

It should be noted that the themes, Use of Resources and Production of Goods and Services also had high agreement levels for both student groups.

To summarise, then, the students tended to have a wide array of both unique and shared meanings for the term Economics, with about three students on average expressing a shared meaning. The most commonly shared meaning combinations were:

1. 7, 10 - Scarce Resources and Choice with 3.9 per cent for the Sixth Formers and 5.6 per cent for the Seventh Formers, and perhaps best explained by the statement:

> I'll define Economics as the study of scarcity and choice. (607 - A Sixth Former in Phase 1 of the Study).

2. 4, 7, 10 - Use of Resources, Scarce Resources and Choice with 3.0 per cent and 6.7 per cent respectively for Sixth and Seventh Formers and perhaps best illustrated by the statement:

> It's a social science. How people use the resources that's available to them and organise themselves. The resources are limited so they've got to choose how to use them to produce things. (604 - A Sixth Former in Phase 1 of Study).

The wide variety of both unique and shared conceptions of the meaning of Economics is, perhaps, best explained by a Sixth Former who stated on the questionnaire:

> Economics can have many meanings as long as it is to do with the economy. (258).

It is interesting to note that Humphreys (1975) also shares the above opinion:

> There are several possible definitions of Economics. They have one feature in common: that material gain is an important motive in human behaviour.

Teacher's Personal Meanings for the Term Economics:

Both groups of Sixth and Seventh Form Teachers offered a narrow or restricted range of themes reflecting their personal meanings - nine for Sixth Form Teachers (1, 4, 6, 7, 10, 11, 13, 14, 16) and 13 for Seventh Form Teachers (2, 4-7, 9-11, 13-16 and 21). The themes were:

1. Money,
2. Politics,
4. Use of Resources,
5. Man Working in Environment,
6. Production of Goods and Services,
7. Scarce Resources,
9. Unlimited Resources,
10. Choice,
11. Unlimited Wants,
13. Human Behaviour,
14. Distribution of Goods and Services,
15. Consumption of Goods and Services,
16. Satisfaction of Wants, and
21. Opportunity Cost.

Table 4.4 summarises the combinations of themes or

Table 4.4 : Teachers' Meanings of Economics

(Percentages Indicate Rate of Meanings that Were Shared)

Sixth Form (Total Meanings = 10)

Meaning	Rate(%)	Meaning	Meaning
4,7,10	21.0	4,7,10,11,13	7,10,13
4,7,10,11	21.0	7,10	7,10,11,16
1,4,6,7,10,14		7,10,11	7,11
4,6,7,10			

Seventh Form (Total Meanings - 18)

Meaning	Rate	Meaning	Meaning
7,10,11	14.0	4,7,10,11	6,7,10,14
4,7,10	9.0	4,6,7,11	7,10,11,16
2,4,7,10		4,6,7,10,14,15	7,10,11,21
4,5,7,13		4,6,10,14	7,10,14
1,6,7,10,14		4,6	7,11
4,6,7,9,10,13		6,7,10,11	7,11,16

Key To Themes

1. Money
2. Politics
4. Use of Resources
5. How Man Works in Environment
6. Production of Goods and Services
7. Scarce Resources
9. Unlimited Resources
10. Choice
11. Unlimited Wants
13. Human Behaviour
14. Distribution of Goods and Services
15. Consumption of Goods and Services
16. Satisfaction of Wants
21. Opportunity Cost

personal meanings both groups of teachers gave for the term Economics. Sixth Form Teachers had between them 10 different meaning patterns of which two were shared by 42 per cent (n = 6) of the teachers. These were:

1. 21 per cent - (4, 7, 10) Use of Resources, Scarce Resources and Choice; and
2. 21 per cent - (4, 7, 10, 11) Use of Resources, Scarce Resources, Choice and Unlimited Wants.

Seventh Form Teachers had between them 18 different patterns of which only two were shared by 23 per cent (n = 5) of the teachers. These were:

1. 14 per cent - (7, 10, 11) Scarce Resources, Choice and Unlimited Wants; and
2. 9 per cent - (4, 7, 10) Use of Resources, Scarce Resources and Choice.

The themes that were frequently included in the personal meanings of both groups of teachers were the Use of Resources, Scarce Resources, Choice and Unlimited Wants (see Table 4.3). Over half of both groups of teachers included Use of Resources, while almost all of them (all in the case of Sixth Form Teachers) included Scarce Resources. Again almost all the Sixth Form teachers included Choice in their personal meanings though only three-quarters of Seventh Form Teachers did so while about half of both groups included Unlimited Wants.

It should be noted that the themes Use of Resources,

Scarce Resources and Choice also had high agreement ratings among both groups of teachers.

The commonly shared combined meaning between both groups of teachers reflected themes 4, 7 and 10, i.e., Use of Resources, Scarce Resources and Choice (21 per cent for Sixth Form Teachers and 9 per cent for Seventh Form Teachers). This meaning is, perhaps, best illustrated by the statement of a Seventh Form Teacher:

> Economics is the study of how man can best use the resources available to him and make choices between the limited resources (4,7,10). (068 - A Seventh Form Teacher).

In general, teachers tended to have unique conceptions for the term Economics as the two statements below illustrate:

> How man makes a living and chooses to spend his income on goods and services. How limited resources are used to satisfy those wants and needs. (628 - A Sixth Form Teacher).

> The study of how societies organize themselves to produce and distribute scarce goods and services. (095 - A Seventh Form Teacher).

In the first statement the teacher refers to man making a living and choosing how to spend his income while in the second, the teacher reflects the themes of production and distribution of scarce goods and services.

The state of the different conceptions for Economics, however, is not unique, in the sense that Economists also tend to have different and unique conceptions for the term Economics. Samuelson (1964) defines Economics as:

> "The study of how men and society choose, with or without the use of money, to employ scarce productive resources to produce various commodities over time and distribute them for consumption, now and in the future, among various people and groups in society." (This definition reflects themes 1, 4, 5, 6, 10, 14, 15 and 23 above).

Humphreys (1975) defines Economics as "the study of mankind in the process of maing a living" reflecting the theme (8). Ammer and Ammer (1984) see it as "the production, distribution, exchange and consumption of goods and services". Compare themes 6, 14 and 15.

Comparison of Student and Teacher Meanings: The fact that Economics can be variously defined by Economists makes the task of determining any mismatch between student and teacher meanings a difficult one. This is compounded by the fact that there was no definition which was shared by a majority of the teachers and which would have been useful as a determinant of the relationship between the meanings of the students and teachers. The above situation is highlighted by a Seventh Form Teacher who stated on the questionnaire:

> No perfect definition. The subject often merges into Geography and Economic History and Politics, as this forthcoming election as covered by the media has extremely demonstrated. (634 - A Seventh Form Teacher).

However, it appeared there were some students who were not happy with the exclusion of some ideas from the definitions of Economics. Student 007, a Seventh Former, in Phase 1 of the study was clearly not in agreement with the tendency of Economists to exclude the theme of Unlimited

Resources in the definition of Economics:

> You know, the Arabs desalinate the sea to produce water and electricity. The sea, as far as I'm concerned is unlimited.

The point that Student 007 wants to make appears to be that goods and services are produced not only with "limited resources" but with "unlimited resources" as well.

Another student, a Sixth Former, stated on the questionnaire concerning the theme Politics:

> In the 6th Form I feel there should be more emphasis placed on why politicians implement certain economic tactics. Many people will leave school and know nothing about politics. How government implements policies - why? The effects on business, consumer, unions etc (149 - A Sixth Former).

The suggestion seems to be that several students are not satisfied with the meanings given to them by their teachers which tend to come from a restricted number of only 15 themes as compared to the 23 themes of the students. The dissatisfaction could be a factor in accounting for the students generating their own several meanings to resolve a possible conceptual conflict. It is of interest to note that even the shared meanings of the teachers were shared by very few students. For instance, among the Sixth Formers, only 0.5 per cent shared the combined meaning 4, 7, 10 and 11 reflecting the themes Use of Resources, Scarce Resources, Choice and Unlimited Wants, which was shared by 21 per cent of the Sixth Form Teachers. Also, the meaning combination 7, 10 and 11 reflecting the themes Scarce Resources, Choice and Unlimited Wants, and shared by 14 per cent of the

Seventh Form Teachers, was only shared by 1.1 per cent of the Seventh Formers.

Analysis of the rate of inclusion of themes in personal meanings (see Table 4.3) showed some significant differences. While a majority of Sixth Form Teachers included in their personal meanings the themes Unlimited Wants (42.9 per cent), Choice (92.9 per cent) and Scarce Resources (100 per cent), only less than half of the Sixth Form Students comparatively did so - 18.5 per cent, 39.7 per cent and 43.7 per cent respectively. On the other hand, while several students included in their personal meanings the themes Money (19.3 per cent), Business (21.1 per cent) and Production of Goods and Services (52.1 per cent), only a handful of the Sixth Form Teachers did so or not at all - 7.1 per cent, 0.0 per cent and 14.3 per cent respectively.

In the Seventh Form, while several students included in their meanings the themes Money and Business (13.5 per cent and 16.9 per cent respectively), none of the teachers did so. However, less than half of the students (18.5 per cent for Sixth Formers and 24.2 per cent for Seventh Formers) in comparison to their teachers (42.9 per cent and 52.4 per cent respectively) included in their meanings the themes Unlimited Wants. It should be noted, however, that a majority of both students and teachers included the theme Use of Resources in their meanings.

THE MEANING OF PRICE

The Thematic Conceptualizations of Price

Figure 4.3 below shows the themes, nine in all, that emerged from an analysis of the transcripts of the interviews with a small sample of students in Phase 1 of the research. (See Appendix 1B).

Price seen as:
1. Amount of Money Paid for Goods and Services
2. Value of Good/Services
3. Cost of Good/Service
4. Production Cost plus Profit
5. Cost of Production
6. Interest of Labour
7. Consumer Point of Buying Good
8. Value of Production
9. Opportunity Cost

Figure 4.3: Themes of Price in Phase 1 of Study

Related to the concept of Price, the predominant themes were the Amount of Money Paid for Goods and Services and the Cost of Good/Service. Thus, for example, students made statements like the following:

> Price is really the amount of money for certain transactions of goods and services. (707 - A Seventh Former)

> The monetary cost of purchasing any good. (603 - A Sixth Former)

> The cost, either monetary or physically, of paying for a good or service or resource. (601 - A Sixth Former)

> Price is the final total cost of a good when you take into account all the variable costs, fixed costs and other factors into consideration in determining the final cost. (602 - A Sixth Former)

In the third statement is can be seen that the idea of Cost refers to both monetary and non-monetary payments for goods and services. Many students also thought of Price as referring to the value or worth of a good or service measured in monetary terms. For example:

> Price is the worth of a good. It's just the amount of money you have to pay for something. (P08 - A Seventh Former)

> Price is the value of a good in relation to what consumers are prepared to pay for it. (P05 - A Seventh Former).

> The amount the consumer has to pay in order to get the good of the supplier. It just put some measure on the value of goods. (701 - A Seventh Former)

> Price is the value of labour, that is, the interest of labour and production measured in money. (604 - A Sixth Former).

Two students, 601 and 603, looked at Price from the idea of opportunity cost. Thus, Student 603 made the following statement:

> How much something cost, that's all. How much you pay for some good. Also price is not only cost but sacrifice or something, that is, opportunity cost. (603 - A Sixth Former).

Apart from the dominant response themes already mentioned, there were no other themes that appeared as patterns across the group.

The Results of the Survey on Price

Reactions to the 9 Themes: Table 4.5 gives a summary of the agreement levels of the large sample of students and teachers with respect to the nine themes that emerged in

Table 4.5 : Indications of Levels of Agreement with Themes of Price

N = 6th Form Students = 426 6th Form Teachers = 14
7th Form Students = 178 7th Form Teachers = 21

(In Percentages)

THEMES		7	6	5	4	3	2	1	Mean	S.D.
1. AMOUNT OF MONEY FOR GOODS/SERVICES	6th F Students	31.9	26.1	17.8	12.7	5.9	3.8	1.9	5.48	2.69
	7th F Students	26.4	31.5	20.8	8.4	9.0	2.8	1.1	5.45	2.29
	6th F Teachers	46.2	23.1		23.1	7.7			5.77	1.80
	7th F Teachers	42.1	31.6	15.8	5.3			5.3	5.80	2.19
2. VALUE OF GOODS/ SERVICE	6th F Students	14.8	25.8	23.5	15.5	9.6	5.9	4.9	4.83	8.77
	7th F Students	11.8	18.5	19.7	27.0	9.0	6.7	7.3	4.48	5.53
	6th F Teachers	30.8	7.7	7.7	23.1	7.7	7.7	15.4	4.46	1.24
	7th F Teachers	10.5	15.8	21.1	15.8	15.8	5.3	15.8	4.11	1.41
3. COST OF GOODS/ SERVICE	6th F Students	22.8	28.5	21.2	11.5	8.9	3.8	3.3	5.20	9.21
	7th F Students	15.7	23.0	19.7	16.9	13.5	6.7	4.5	4.72	5.40
	6th F Teachers	15.4	15.4	7.7	38.5		15.4	7.7	4.30	1.41
	7th F Teachers		21.1	15.8	10.5	15.8	26.3	10.5	3.58	1.59
4. PRODUCTION COST PLUS PROFIT	6th F Students	21.1	22.1	17.4	16.2	8.2	8.2	6.8	4.80	8.40
	7th F Students	19.7	27.0	21.3	14.6	5.6	7.3	4.5	4.89	5.71
	6th F Teachers	38.5	15.4		15.4	7.7		23.1	4.69	1.52
	7th F Teachers	10.5	10.5	15.8	26.3	5.3	5.3	26.3	3.74	1.62
5. COST OF PRODUCTION	6th F Students	3.8	11.3	16.4	24.9	17.6	15.3	10.8	3.70	8.40
	7th F Students	1.7	6.7	19.1	19.7	19.1	19.1	14.6	3.37	6.04
	6th F Teachers	7.7		23.1	23.1	7.7		38.5	3.33	1.67
	7th F Teachers	5.3	15.8	10.5	10.5	5.3	36.8	15.8	3.31	1.75
6. INTEREST OF LABOUR	6th F Students	0.7	1.4	8.5	12.0	23.3	26.2	27.8	2.54	9.66
	7th F Students	1.1	1.1	4.5	15.2	20.8	20.8	36.5	2.38	6.53
	6th F Teachers				7.7		7.7	84.6	1.31	2.91
	7th F Teachers		5.3		5.3		10.5	78.9	1.53	3.34
7. CONSUMER POINT	6th F Students	12.7	20.4	18.3	14.1	12.9	11.3	10.3	4.31	7.96
	7th F Students	11.8	19.1	18.0	19.7	12.4	11.2	7.9	4.33	5.16
	6th F Teachers	30.8	15.4		7.7	7.7	7.7	30.8	4.08	1.41
	7th F Teachers	10.5	5.3	10.5	26.3	5.3	5.3	36.8	3.26	3.47
8. VALUE OF PRODUCTION	6th F Students	1.4	7.8	13.2	23.3	23.8	19.1	11.3	3.37	8.78
	7th F Students		6.2	14.0	22.5	25.3	16.3	15.7	3.21	5.72
	6th F Teachers	7.7		7.7	15.4	23.1		46.2	2.69	1.71
	7th F Teachers		15.8	15.8	15.8	5.3	15.8	31.6	3.16	1.69
9. OPPORTUNITY COST	6th F Students	7.3	12.0	12.7	12.2	14.8	16.9	24.2	3.37	8.18
	7th F Students	5.1	10.1	19.7	10.1	19.1	14.6	21.3	3.43	5.33
	6th F Teachers	30.8	15.4	7.7	15.4		7.7	23.1	4.46	1.30
	7th F Teachers	26.3	21.1	10.5	15.8		5.3	21.1	4.58	1.65

Note: 7 = Completely Agree; 1 = Completely Disagree

Phase 1 of the study. Only the theme Amount of Money Paid for Goods and Services received a high agreement level for both student and teacher groups. ($\overline{X}$ = 5.48, SD = 9.69 - Sixth Formers; $\overline{X}$ = 5.45, SD = 6.29 - Seventh Formers; X = 5.77, SD = 1.80 - Sixth Form Teachers; $\overline{X}$ = 5.80, SD = 2.19 - Seventh Form Teachers). The theme Cost of a Good/Service received a high agreement level ($\overline{X}$ = 5.20, SD = 9.21) only among the Sixth Form Students.

About half of the teacher groups completely agreed with the theme Amount of Money Paid for Goods/Services (46.2 per cent for Sixth Form Teachers with $\overline{X}$ = 5.77, SD = 1.80; 42.1 per cent for Seventh Form Teachers with $\overline{X}$ = 5.80, SD = 2.19).

The theme Interest of Labour received a low agreement level for both groups of students and teachers, with over three-quarters of the teacher groups completely disagreeing with the theme (84.6 per cent; $\overline{X}$ = 1.31, SD 2.91 for Sixth Form Teachers; 78.9 per cent; $\overline{X}$ = 1.53, SD = 3.34 for Seventh Form Teachers).

	Themes From Part A of Questionnaire
(1)	Amount of Money for Goods/Services
(2)	Value of a Good/Service
(3)	Cost a Good/Service
(4)	Production Cost Plus Profit
(5)	Cost of Production
(6)	Interest of Labour
(7)	Point Consumer Will Buy
(8)	Value of Production
(9)	Opportunity Cost of Good/Service
	Themes from Part B of Questionnaire
(10)	Exchange Value
(11)	Return for Risk of Production
(12)	Equilibrium Point i.e. Where Supply = Demand
(13)	Signal for Consumers to Buy and Producers to Produce
(14)	Scarcity of Product
(15)	What Seller offers to sell good at, not necessarily what is paid
(16)	Willingness of Consumers to Pay
(17)	Marginal Utility of Good
(18)	Risk

Figure 4.4: Themes of Price from Parts A and B of Questionnaire

Students' Personal Meanings of Price: Response to Section B of the questionnaire on the term Price resulted in an addition of eight themes to the nine already derived from Phase 1 of the study. The whole 17 themes are presented in Figure 4.4 above.

The personal meanings of Price for both groups of students reflected a wide range of themes. Sixth Formers indicated a range of 15 themes (1-12, 14-16) while Seventh Formers revealed a range of 17 (1-14, 16-18).

Analysis of the meaning combinations showed 105 combinations for the Sixth Form group. Of these 49 were shared by 86.6 per cent (n = 370), or an average of one pattern of meaning by about eight students. This left, therefore, 13.4 per cent (n = 56) of unique meanings (see Appendix 2B). In the case of the Seventh Formers, there were 59 patterns of which 27 were shared by 80.8 per cent (n = 135) and 32 meanings (see Appendix 2B) or 19.2 per cent, were unique. Eleven Seventh Formers did not indicate their meanings.

Table 4.6 summarises the picture of the meaning combinations of both student groups. From the Table it can be seen that no one meaning enjoyed a high level of sharing. There were three shared meaning combinations with a rate of above five per cent among the Sixth Formers. These were:

1. 8.2 per cent - (1,3) Amount of Money for Goods/Services and Cost of Good/Service;

2. 6.6 per cent - (1,4) Amount of Money for

Table 4.6 : Percentages of Students' Shared Meanings of Price

Sixth Form (Total Shared Meanings = 49)

Meaning	Rate%	Meaning	Rate	Meaning	Rate	Meaning	Rate
1,3	8.2	4,7	2.6	4,9	0.9	2.3,5	0.5
1,4	6.6	1,3,4	2.1	1,2,3,7	0.7	2,8	0.5
1	5.1	2,7	2.1	1,2,3,4,7	0.7	2,4,7	0.5
1,4,7	4.7	7	2.1	1,3,9	0.7	2,4,9	0.5
3,4	4.0	3,9	1.9	3,4,12	0.7	2,7.9	0.5
1,2	3.6	1,3,7	1.4	4,7,12	0.7	3,5,7	0.5
1,2,3	3.6	2,3,7	1.1	7,9	0.7	3,5,9	0.5
1,7	3.6	3,5	1.1	12	0.7	3,12	0.5
3	3.6	3,7	1.1	1,2,8	0.5	4,5	0.5
4	3.6	1,2,4	0.9	1,3,4,7	0.5	5,7	0.5
2,3	2.8	1,2,3,4	0.9	1,3,5	0.5	5,9	0.5
2	2.6	1,2,9	0.9	1,5	0.5	9	0.5
2,4	2.6						

Seventh Form (Total of Shared Meanings = 27)

Meaning	Rate%	Meaning	Rate	Meaning	Rate	Meaning	Rate
1,4	7.9	1,7	2.3	1,2	1.7	3,7	1.7
1,3	6.2	1,7,12	2.3	1,2,3	1.7	1,2,3,7	1.1
4,7	6.2	1,9	2.3	1,3,7	1.7	1,3,12	1.1
1	5.6	2,4	2.3	1,3,4,7	1.7	4,6	1.1
2	4.5	3	2.3	1,4,7	1.7	16	1.1
1,2,4	3.4	4	2.3	2,9	1.7		
1,3,4	2.3						

Key to Themes

1. Amount of Money Paid for Good/Service
2. Value of Good/Service
3. Cost of Good/Service
4. Production Cost Plus Profit
5. Cost of Production
6. Interest of Labour
7. Consumer Point to Buy Good/Service
8. Value of Production
9. Opportunity Cost
12. Supply-Demand Equilibrium
16. Willingness of Consumers to Buy

Goods/Services and Production Cost Plus Profit; and

3. 5.1 per cent - (1) Amount of Money for Goods/Services.

There were four shared meaning combinations with a rate of above five per cent in the Seventh Form group. These were:

1. 7.9 per cent - (1,4) Amount of Money for Goods/Services and Production Cost Plus Profit;

2. 6.2 per cent - (1,3) Amount of Money for Goods/Services and Cost of Good/Service;

3. 6.2 per cent - (4,7) Production Cost Plus Profit and Point Consumer will Buy.

4. 5.6 per cent - (1) Amount of Money For Goods/Services.

Table 4.7 provides a summary of the rate at which themes were included in personal meanings of Price by students and teachers. It will be seen that it is only the theme Amount of Money Paid for Goods/Services which had half of both student groups including it in their personal meanings. It is of interest to note that this particular theme also had a high agreement rating with both student groups. However, over one-third of both student groups included the themes Cost of Good/Service and Production Cost Plus Profit in their personal meanings.

Table 4.7 : Percentage of Themes of Price Included in Personal Meanings of Price

THEMES →	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Sixth Formers (N = 426)	51.4	29.3	42.3	36.4	9.9	3.1	29.8	3.8	12	0.2	0.2	4	0	0.5	0.2	0.5	0	0
Sixth Form Teachers (N = 14)	57.1	28.6	21.4	28.6	7.1	0	28.6	0	35.7	0	0	0	0	0	0	0	0	0
Seventh Formers (N = 178)	55.6	28.7	34.8	44.5	6.7	1.1	32.0	2.2	9.6	1.1	5.1	0.6	0.6	1.1	0	1.1	1.1	0.6
Seventh Form Teachers (N = 21)	47.6	28.6	4.8	14.3	14.3	9.5	23.8	4.8	28.6	9.5	0	0	0	0	0	0	0	0

Key to Themes

1. Amount of Money Paid for Goods or Services
2. Value of a Good or Service
3. Cost of a Good or Service
4. Production Cost plus Profit
5. Cost of Production
6. Interest of Labour
7. The Point where Consumer will buy a Good or Service
8. Value of Production
9. Opportunity Cost of a Good or Service
10. Exchange Value
11. Return for Risk of Production
12. Where Supply Equals Demand, i.e. Equilibrium Point
14. Scarcity of Product
15. What Seller offers to sell the Good at, not necessarily What is paid
16. Willingness of Consumers to pay
17. Marginal Utility of Good
18. Risk

The most commonly shared combined meanings between the student groups were:

1. 1,3 (Amount of Money Paid for Goods/Services and Cost of a Good/Service) and best illustrated by the statement:

> The cost, either monetary or physically of paying for a good or service or resource. (601 - A Sixth Former in Phase 1).

2. 1,4 (Amount of Money Paid for Goods/Services and Production Cost Plus Profit:

> The cost of a good or service including production profit. (007 - A Seventh Former in Phase 1 of the study).

3. 1 (Amount of Money Paid for Goods/Services):

> The monetary cost of purchasing any good. (603 - A Sixth Former in Phase 1 of the study).

Economists look at Price from the point of view of concepts of exchange. In other words, they refer to what must be given up to get something, that is, the opportunity cost defined by Lindauer (1977) as "what must be given up" to obtain something, where the exchange of what is forgone is usually, though not always, measured in terms of money. Ammer and Ammer (1984) define Price as

> "The exchange value of a good or service expressed in terms of money."

and Lindauer (1977) as:

> "What must be given up to get something. Usually the price of something is expressed in terms of the amount of money that must be paid to get it."

The Economists' meaning of Price should, therefore, basically reflect the themes Opportunity Cost (9) or Exchange Value (10), and possibly in combination with themes Amount of Money Paid for Goods/ Services (1) and Cost of Good/Service (3). Analysis, however, showed that very few of the students in the present study included the themes Opportunity Cost and Exchange Value in their personal meanings: Sixth Formers - 12 per cent and 0.2 per cent respectively; Seventh Formers - 9.6 per cent and 1.1 per cent respectively. The low inclusion rate of these themes in the personal meanings of the students suggests that a majority of the students possess conceptions of Price which do not reflect Economists' meaning. It should be noted that the theme Opportunity Cost which relates to Economists' meaning of Price did not receive a high level of agreement among the students. It appears that the students' conceptions reflect aspects of Price such as how it is determined by the forces of demand and supply or as a monetary value, but not "what" it actually is.

In Phase 1 of the study, however, two students did reflect the Economists' meaning of Price. Thus, they said:

> Well, it's not just the money I might pay for something I may buy but also how the producer has to pay for resources. And also not just the money terms, but price is also on things you're made to give up. It's sort of like opportunity cost. (601 - A Sixth Former).

> How much something cost, that's all. How much you pay for some good. Also price is not only cost but sacrifice or something, that is, opportunity cost. (603 - A Sixth Former).

Table 4.8 : Teachers' Meanings of Price

(Percentages Indicate Rate of Shared Meanings)

Sixth Form (Total Meanings = 10)

Meaning	Rate (%)	Meaning	Meaning
1	14.0	1,7	4,7
2,9	14.0	1,9	5,7,9
1,3		1,4	9
1,2,3,4			

Seventh Form (Total Meanings = 16)

Meaning	Rate (%)	Meaning	Meaning
1	19.0	1,4	3,7,8,9
2,5	9.0	1,4,7	4,6,7
10	9.0	1,5	6
1,2		1,9	7,9
1,3,9		2	9
		2,9	

Key to Themes

1. Amount of Money Paid for Goods/Services
2. Value of Good/Service
3. Cost of Good/Service
4. Production Cost Plus Profit
5. Cost of Production
6. Interest of Labour
7. Point Consumer will buy
8. Value of Production
9. Opportunity Cost of Good/Service
10. Exchange Value

Teachers' Meanings of Price: Both groups of teachers offered a restricted range of themes reflecting their meanings of Price - seven for Sixth Form Teachers (1-5, 7, 9) and 10 for Seventh Form Teachers (1-10). (See Figure 4.3 for descriptions of themes.)

Table 4.8 gives a summary of the meaning combinations or meanings of teachers. Sixth Form Teachers indicated 10 different meanings while Seventh Form Teachers showed a total of 16. Out of the 10 meanings of the Sixth Form Teachers, two were shared by 28 per cent (n = 4) of the teachers with the rest eight meanings being unique. The shared meanings were:

1. 14 per cent - (1) Amount of Money For Goods/Services.

2. 14 per cent - (2, 9) Value of a Good/Service and Opportunity Cost of a Good/Service.

In the case of the Seventh Form Teachers, three meanings were shared by 37 per cent (n = 8) with 13 being unique. The shared meanings were:

1. 19 per cent - (1) Amount of Money Paid For Goods/Services;

2. 9 per cent - (2,5) Value of a Good/Service and Cost of Production; and

3. 9 per cent - (10) Exchange Value.

Like the students, about half of both groups of

teachers included the theme Amount of Money Paid for Goods/Services in their meanings of Price. About a third of both groups of teachers included the themes Value of Production and Opportunity Cost in their meanings. (See Table 4.7 for a summary of the rate with which themes were included in personal meanings of teachers).

The commonly shared meaning between the teachers was (1) Amount of Money Paid for Goods/Services (Sixth Form Teachers - 14 per cent, and Seventh Form Teachers - 19 per cent).

Since only about a third of the teachers included the theme Opportunity Cost in their meanings (35.7 per cent for Sixth Form Teachers and 28.6 per cent for Seventh Form Teachers) and very few of them did so for the theme Exchange Value (0.0 per cent for Sixth Form Teachers and 9.5 per cent for Seventh Form Teachers), the suggestion could be made that a majority of the teachers, like the students, tend to have conceptions of Price different from that of Economists. The teachers' conceptions tended to reflect some aspects of Price such as how Price functions in an economic system, but not what Price actually is. Thus a teacher stated:

> The monetary value that clears the market i.e. equates demand and supply. (096 - A Sixth Form Teacher).

And another:

> Price is the means by which goods and services are bought and sold through the medium of money. It is the measurement of value in terms of money. (174 - A Seventh Form Teacher).

Comparison of Student and Teacher Meanings: Both students and teachers tended to have several conceptions of Price though that of the students was much wider. The theme Amount of Money paid for Goods/Services was included in the meanings of about half of both student and teacher groups. The same theme was the commonly held meaning of Price by many teachers (Sixth Form Teachers - 14 per cent; Seventh Form Teachers - 19 per cent) as against only a few students (Sixth Form Students - 5.1 per cent; Seventh Form Students - 5.6 per cent).

While about a third of the teachers included the theme Opportunity Cost in their meanings, just a few of the students did so (12 per cent for Sixth Formers, and 9.6 per cent for Seventh Formers). Since the theme Opportunity Cost is basic to the meaning of Price, the low inclusion in student meanings of Price suggests that the meaning of Price from the viewpoint of Economists, is not being effectively introduced, or its meaning made very clear, to the students. This is compounded, too, by the fact that the majority of teachers have conceptions of Price reflecting mostly the aspects of Price and not what Price actually is. It should be noted, however, that students also tend to reflect conceptions of Price describing its aspects. While some students seemed to realize that the aspects of Price do not describe the actual meaning of Price, nevertheless, they still had incomplete meanings of Price, namely:

> The actual price is not the cost of the good. Equilibrium is not price. It is just when the amount the supplier is willing to supply meets the demand and the consumer is willing

> to purchase, and that the market naturally goes to that position. (701 - A Seventh Former).

THE MEANING OF CAPITAL

The Thematic Conceptualizations of Capital

The analysis of the transcripts of interviews on Capital (See Appendix 1C) saw the emergence of 16 themes of Capital which are presented in Figure 4.5.

In Phase 1 of the study, the themes that were prominently used to describe Capital were Money, Machinery and Man-Made Products Used to Produce Other Products. Statements made by students referring to the above themes included the following:

> More money orientated. It's what is used in production. Capital, to me, is money used in production. You need it first before you can go round to buy your land, and your other factors of production. And you need to pay for the employee's wages, then the test of control for your stages of production if you're going to continue the process of production. (605 - A Sixth Former).

> The big machinery that helps to produce the products in a way. For instance, in a potato farm the capital would be the big machines. (P05 - A Seventh Former).

> Man-made goods used in production of other man-made goods. It's a long term fixed asset, an house, machinery, cars. You talk about your capital outlay of a private person's home, you mean that house, their land; but in Economics, it's really any piece of equipment which is used to make other pieces of equipment like processing and the like. (607 - A Sixth Former).

Capital seen as:

1. Money
2. Bonds
3. Money Borrowed from Banks to get Business Started, i.e. Finance
4. Something Used to Produce Goods
5. Money to Buy Resources and Pay for Labour
6. Machinery
7. Goods that Produce Other Goods
8. Buildings
9. Man-made Goods Used in Factories
10. Machines and Factories
11. Man-made Products to Make Products
12. The Wage or Money Value of the Factors of Production
13. Things already produced
14. Longterm Fixed Asset
15. Assets, and
16. Investment

Figure 4.5: Themes of Capital In Phase 1 of Study

The themes Investment and Assets, though not so prominent as the above three themes, were still used frequently by a few students to describe their meanings of Capital. Examples of statements of students referring to these themes include:

> It's asset that you may have, money wise, and in any form such as building. Anything that is of value you have personally set aside ... Total assets that you own, that is, a lump sum that you have invested in a business or firm. (603 - A Sixth Former).

> Capital is nothing but investment. Without investment we can't produce goods and services. Capital is the investment needed to produce goods and services. (604 - A Sixth Former).

Still other themes, such as Bonds, tended to be unique:

> Capital is money or bonds, things like that. (P08 - A Seventh Former).

Most students who saw Capital in terms of Money tended to view it as being used to pay for resources, to get a business started, to pay for labour, or, as a measure of the value of the factors of production. Thus, Student P08 elaborated the meaning of Capital as:"

> What a producer can use to hold his business and produce his good. Just to have that capital buy his resources, get his business going. And this can be repaid with the money he raises for selling his goods. If the producer can get his money, his capital, he can buy bigger buildings, better sites, faster trucks, more efficient machines and things like that. (P08 - A Seventh Former).

The Results of the Survey on Capital

Reactions to the 16 Themes: In Phase Two of the study, a large sample of students and teachers were asked to

Table 4.9 : Indications of Levels of Agreement with Themes of Capital

N : 6th Form Students = 426; 7th Form Students = 178; 6th Form Teachers = 14; 7th Form Teachers = 21

(In Percentages)

			7	6	5	4	3	2	1	Mean	S.D.
1. MONEY	6th F	Students	8.7	16.7	16.9	15.3	12.5	12.9	16.9	3.87	7.88
	7th F	Students	10.2	10.2	16.5	20.5	8.0	15.9	18.8	3.71	5.16
	6th F	Teachers	14.3		7.1		14.3	14.3	50.0	2.43	1.85
	7th F	Teachers			5.3	10.5	26.3		57.9	2.05	2.64
2. BONDS	6th F	Students	1.9	3.3	9.4	19.6	19.3	21.2	25.2	2.84	9.03
	7th F	Students	1.1	5.1	10.1	16.3	18.0	27.0	22.5	2.84	5.80
	6th F	Teachers			14.3	7.1	7.1	28.6	42.9	2.21	1.77
	7th F	Teachers				5.3	21.1	5.3	68.4	1.63	2.97
3. MONEY BORROWED FROM BANK TO START BUSINESS	6th F	Students	6.9	16.8	22.0	16.8	13.9	11.1	12.5	4.02	8.08
	7th F	Students	3.4	19.7	18.0	20.2	18.0	12.9	7.9	4.00	5.38
	6th F	Teachers	14.3		14.3	21.4	14.3	14.3	21.4	3.50	1.20
	7th F	Teachers		5.3	10.5	15.8	15.8	15.8	36.8	2.63	1.81
4. SOMETHING USED TO PRODUCE GOODS	6th F	Students	27.5	27.5	21.1	9.2	8.2	3.3	3.3	5.34	9.47
	7th F	Students	19.7	24.7	20.8	18.0	8.4	6.2	2.2	5.02	5.68
	6th F	Teachers	64.3	21.4	7.1				7.1	6.21	2.36
	7th F	Teachers	26.3	26.3	10.5	15.8	21.1			5.21	1.78
5. MONEY TO BUY RESOURCES	6th F	Students	5.0	12.8	20.3	19.4	15.6	12.5	14.4	3.77	8.13
	7th F	Students	3.9	10.7	18.0	22.5	14.0	18.0	12.9	3.62	5.32
	6th F	Teachers	14.3	14.3	7.1	7.1	14.3	7.1	35.7	3.43	1.36
	7th F	Teachers		15.8	10.5	5.3	10.5	10.5	47.4	2.68	2.10
6. MACHINERY	6th F	Students	27.4	27.6	17.2	15.1	5.7	3.3	3.8	5.36	9.36
	7th F	Students	20.8	27.0	23.6	11.8	6.7	7.3	2.8	5.10	5.82
	6th F	Teachers	50.0	21.4	7.1		14.3		7.1	5.64	1.89
	7th F	Teachers	31.6	15.8	26.3	5.3	10.5	10.5		5.21	1.78
7. GOODS THAT PRODUCE OTHER GOODS	6th F	Students	40.0	24.0	14.6	7.5	5.2	4.5	4.2	5.56	10.28
	7th F	Students	39.9	22.5	15.2	7.9	5.6	3.4	5.6	5.51	6.54
	6th F	Teachers	78.6	14.3		7.1				6.64	2.83
	7th F	Teachers	68.4	21.1	5.3	5.3				6.53	2.97
8. BUILDINGS	6th F	Students	14.9	19.6	20.5	19.3	9.9	8.7	7.1	4.56	8.23
	7th F	Students	9.6	13.5	21.3	18.5	14.0	14.6	8.4	4.08	5.16
	6th F	Teachers	28.6	35.7	7.1	7.1	14.3		7.1	5.29	1.56
	7th F	Teachers	21.1	15.8	10.5	15.8	26.3	10.5		4.58	1.59

			7	6	5	4	3	2	1	Mean	S.D.
9. MAN-MADE GOODS USED IN FACTORIES	6th F	Students	12.3	18.2	14.7	18.5	15.6	12.3	8.3	4.23	7.91
	7th F	Students	9.6	14.0	22.5	21.9	9.0	12.9	10.1	4.14	5.28
	6th F	Teachers	35.7	35.7	7.1		7.1	7.1	7.1	5.43	1.60
	7th F	Teachers	27.8	11.1	27.8	11.1	11.1	5.6	5.6	4.94	1.60
10. MACHINES AND FACTORIES	6th F	Students	21.7	27.1	18.4	15.3	8.3	5.4	3.8	5.07	8.90
	7th F	Students	17.4	23.0	23.0	15.7	7.3	9.0	4.5	4.83	5.52
	6th F	Teachers	50.0	21.4		14.3	7.1		7.1	5.64	1.89
	7th F	Teachers	26.3	31.6	15.8	5.3	10.5	10.5		5.26	1.78
11. MAN-MADE PRODUCTS USED TO MAKE PRODUCTS	6th F	Students	25.7	21.1	19.5	11.9	9.0	8.3	4.5	5.00	8.64
	7th F	Students	20.8	21.9	16.9	14.6	7.9	7.3	10.7	4.69	5.33
	6th F	Teachers	85.7	14.3						6.86	3.09
	7th F	Teachers	63.2	21.1	5.3		10.5			6.26	2.77
12. MONEY VALUE OF PRODUCTION FACTORS	6th F	Students	2.8	5.2	6.4	14.2	22.7	20.8	27.9	2.77	9.15
	7th F	Students	2.2	5.1	9.0	15.7	19.1	20.8	28.1	2.81	5.80
	6th F	Teachers		7.1		7.1		14.3	71.4	1.71	2.56
	7th F	Teachers					5.3	21.1	73.7	1.32	3.20
13. THINGS ALREADY PRODUCED	6th F	Students	2.6	2.8	7.1	8.7	18.2	23.3	37.3	2.44	10.04
	7th F	Students	1.1	3.9	6.2	7.9	18.0	30.3	32.6	2.41	6.49
	6th F	Teachers	14.3			7.1	14.3	21.4	42.9	2.57	1.69
	7th F	Teachers		5.3		10.5		26.3	57.9	1.84	2.64
14. LONG TERM FIXED ASSET	6th F	Students	10.6	16.3	20.3	17.9	11.8	12.0	11.1	4.16	7.96
	7th F	Students	7.9	15.7	17.4	19.1	12.9	13.5	13.5	3.92	5.08
	6th F	Teachers	14.3	14.3	14.3		28.6	7.1	21.4	3.79	1.31
	7th F	Teachers	10.5	10.5	10.5	26.3	15.8	15.8	10.5	3.84	1.45
15. ASSETS	6th F	Students	14.4	16.9	20.2	16.9	12.9	11.1	7.5	4.40	8.02
	7th F	Students	9.0	18.0	20.2	21.9	12.9	9.0	9.0	4.25	5.28
	6th F	Teachers	7.1	14.3	7.1	14.3	28.6	14.3	14.3	3.57	1.20
	7th F	Teachers			10.5	36.8	10.5	10.5	31.6	3.37	2.03
16. INVESTMENT	6th F	Students	15.5	14.6	19.1	20.9	12.5	8.2	9.2	4.38	8.04
	7th F	Students	10.7	15.7	25.8	19.1	10.7	9.0	9.0	4.34	5.36
	6th F	Teachers	14.3	14.3	7.1	14.3		21.4	28.6	3.50	1.31
	7th F	Teachers	5.3	31.6	5.3	10.5	5.3	5.3	36.8	3.58	1.97

Note: 7 = Completely Agree; 1 = Completely Disagree

indicate their levels of agreement with the themes of Capital that emerged in Phase One. Table 4.9 summarises the agreement levels of both students and teachers. Three themes received a high agreement level for both student groups. These were the themes: Something Used to Produce Goods ($\bar{X}$ = 5.34; SD = 9.47 for Sixth Formers; $\bar{X}$ = 5.02; SD = 5.68 for Seventh Formers); Machinery ($\bar{X}$ = 5.36; SD = 9.36 for Sixth Formers; $\bar{X}$ = 5.10, SD = 5.82 for Seventh Formers), and Goods that Produce Other Goods ($\bar{X}$ = 5.56, SD = 10.28 for Sixth Formers; $\bar{X}$ = 5.51, SD = 6.54 for Seventh Formers). Over one-third of both student groups (40.0 per cent for Sixth Formers; 39.9 per cent for Seventh Formers) completely agreed with the theme Goods that Produce Other Goods. The themes Machines and Factories and Man-made Products Used to Make Products received a high agreement level only for the Sixth Formers ($\bar{X}$ = 5.07, SD = 8.90 and $\bar{X}$ = 5.00, SD = 8.64 respectively).

Three themes had a low agreement score among both student groups. These were: Bonds ($\bar{X}$ = 2.84, SD = 9.03 for Sixth Formers; $\bar{X}$ = 2.84, SD = 5.80 for Seventh Formers); Money Value of the Factors of Production ($\bar{X}$ = 2.77, SD = 9.15 for Sixth Formers; $\bar{X}$ = 2.81, SD = 5.80 for Seventh Formers, and Things Already Produced ($\bar{X}$ = 2.44, SD = 10.04 for Sixth Formers; $\bar{X}$ = 2.41, SD = 6.49 for Seventh Formers). About one-third of the students (37.3 per cent of Sixth Formers and 32.6 per cent of Seventh Formers) completely disagreed with the theme Things Already Produced.

Five themes received a high agreement level with both

groups of teachers. These were the themes:

1. Something Used to Produce Goods ($\overline{X}$ = 6.21, SD = 2.36 for Sixth Form Teachers; $\overline{X}$ = 5.21, SD = 1.78 for Seventh Form Teachers) with about two-thirds of the Sixth Form Teachers (64.3 per cent) completely agreeing with the theme.

2. Machinery ($\overline{X}$ = 5.64. SD = 1.89 for Sixth Form Teachers and $\overline{X}$ = 5.21, SD = 1.78 for Seventh Form Teachers) with half of Sixth Form Teachers (50.0 per cent) and about one-third of Seventh Form Teachers (31.6 per cent) completely agreeing with the theme.

3. Goods that Produce Other Goods ($\overline{X}$ = 6.64, SD = 2.83 for Sixth Form Teachers; $\overline{X}$ = 6.53, SD = 2.97 for Seventh Form Teachers) with about two thirds of both groups of teachers (78.6 per cent for Sixth Form Teachers; 68.4 per cent for Seventh Form Teachers) completely agreeing with the theme.

4. Machines and Factories ($\overline{X}$ = 5.64, SD = 1.89 for Sixth From Teachers; $\overline{X}$ = 5.26, SD = 1.78 for Seventh Form Teachers) with half (50.0 per cent) of the Sixth Form Teachers completely agreeing with the theme.

5. Man-made Products Used to Make Products ($\overline{X}$ = 6.86, SD = 3.09 for Sixth Form Teachers; $\overline{X}$ = 6.26, SD = 2.77 for Seventh Form Teachers) with

almost all the Sixth Form Teachers (85.8 per cent) and about two-thirds of the Seventh Form Teachers (63.2) per cent) completely agreeing with the theme.

In addition, the themes Buildings and Man-made Goods Used in Factories received a high level of agreement among the Sixth Form Teachers ($\overline{X}$ = 5.29, SD = 1.56 and $\overline{X}$ = 5.43, SD = 1.69 respectively) with about one-third completely agreeing with the theme Man-made Goods Used in Factories.

The themes that had a low level of agreement between both groups of teachers included:

1. Money ($\overline{X}$ = 2.43, SD = 1.85 for Sixth Form Teachers; $\overline{X}$ = 2.05, SD = 2.64 for Seventh Form Teachers) with about half of the teachers (50.0 per cent of Sixth Form Teachers and 57.9 per cent of Seventh Form Teachers) completely disagreeing with it.

2. Bonds ($\overline{X}$ = 2.21, SD = 1.77 for Sixth Form Teachers; $\overline{X}$ = 1.63, SD = 2.97 for Seventh Form Teachers) with almost half (42.9 per cent of Sixth Form Teachers and over two-thirds (68.4 per cent) of Seventh Form Teachers completely disagreeing with the theme.

3. Money Value of Factors of Production ($\overline{X}$ = 1.71, SD = 2.56 for Sixth Form Teachers; $\overline{X}$ = 1.32, SD = 3.20 for Seventh Form Teachers) with

over two-thirds (71.4 per cent and 73.7 per cent respectively) of the teachers completely disagreeing with the theme.

4. Things Already Produced ($\overline{X}$ = 2.57, SD = 1.69; $\overline{X}$ = 1.84, SD = 2.64 respectively) with about half of the teachers (42.9 per cent and 57.9 per cent respectively) completely disagreeing.

In addition, the themes Money Borrowed from Banks to Start Business and Money to Buy Resources received a low agreement level ($\overline{X}$ = 2.63, SD = 1.81 and $\overline{X}$ = 2.68, SD = 2.10 respectively) for the Seventh Form Teachers with almost half of them (47.4 per cent) completely disagreeing with the latter theme.

Students' Personal Meanings of Capital: There were additional seven themes which came up in response to Section B of the questionnaire on the term Capital, giving a total of 23 themes on Capital. The whole 23 themes are shown in Figure 4.6.

1. Money
2. Bonds
3. Money Borrowed from Banks to Get Business Started
4. Something Used to Produce Goods
5. Money to Buy Resources and Pay for Labour
6. Machinery
7. Goods that Produce Other Goods
8. Buildings
9. Man-Made Goods Used in Factories
10. Machines and Factories
11. Man-made Products Used to Make Products
12. The Wage or Money Value of the Factors of Production
13. Things Already Produced
14. Longterm Fixed Asset
15. Assets
16. Investment
17. Something of Value Used to Produce Something of Value
18. Man-made Factor Used as Intermediary of Final Goods
19. Value of Business
20. Things Not Consumed Directly by Consumer
21. Investment in New Technology
22. Land
23. A Resource that is Both Limited and Necessary for Production

Figure 4.6: Themes of Capital from Parts A and B of Questionnaire

The personal meanings of students for the term Capital showed a goodly amount of thematic conceptualizations. Sixth Formers presented a range of 21 themes (1-19, 21, 22) and a range of 19 for Seventh Formers (1-16, 19, 20, 23). There was a total of 240 meaning combinations or meanings for the Sixth Form group out of which 59 were shared by 56.8 per cent (n = 238) of the Sixth Formers. This, therefore, left 181 or 43.2 per cent unique meanings (see Appendix 2C). Seven of the Sixth Formers did not indicate any meaning. The Seventh Formers had between them a total of 104 meaning combinations or meanings out of which 20 were shared by 49.1 per cent (n = 81) of the students with 50.9 per cent of the students (n = 84) having unique meanings (see Appendix 2C).

The meanings that were shared by both groups of students are summarised in Table 4.10. As this Table shows, only two meaning combinations enjoyed a shared rate of above four per cent among the Sixth Formers. These were:

1. 5.3 per cent - (7) Goods that Produce Other Goods; and
2. 4.8 per cent - (4, 7) Something Used to Produce Goods, and Goods that Produce Other Goods.

In the case of the Seventh Form, three meaning combinations had a shared rate of above four per cent. These were:

1. 7.3 per cent - (7, 11) Goods that Produce Other Goods and Man-made Products Used to Make Products;

Table 4.10 : Percentages of Students' Shared Meanings of Capital

Sixth Form (Total Shared Meanings = 59)

Meaning	Rate%	Meaning	Rate	Meaning	Rate	Meaning	Rate
7	5.8	4,11	1.0	1,6,8,10	0.5	4,11,16	0.5
4,7	4.8	6,11	1.0	1,7,15	0.5	4,16	0.5
7,11	3.4	1	0.7	3,4,7	0.5	5	0.5
4	3.1	1,4,6,7	0.7	3,5,6	0.5	5,15	0.5
11	2.1	3,4	0.7	3,7,16	0.5	6,7,11	0.5
3	1.7	3,16	0.7	3,7,10	0.5	6,7,16	0.5
3,7	1.7	4,6	0.7	3,11	0.5	6,15	0.5
4,7,11	1.7	5,7	0.7	3,14	0.5	6,8,10	0.5
6,7	1.7	6,7,10	0.7	4,6,7,10	0.5	7,10	0.5
1,7	1.7	7,14	0.7	4,6,7,11	0.5	7,12	0.5
7,15	1.2	9,11	0.7	4,6,10	0.5	7,14,16	0.5
7,16	1.2	15	0.7	4,7,9,11	0.5	11,16	0.5
10	1.2	1,3,5	0.5	4,7,10	0.5	14,15,16	0.5
3,6,7	1.0	1,4	0.5	4,7,14	0.5	15,16	0.5
4,6,7	1.0	1,14	0.5	4,15	0.5		

Seventh Form (Total of Shared Meanings = 20)

Meaning	Rate%	Meaning	Rate	Meaning	Rate	Meaning	Rate
7,11	7.3	4,7,11	2.2	7,16	1.7	5,16	1.1
7	5.6	11	2.2	1	1.1	5,7	1.1
4,7	4.5	1,3	1.7	1,3,16	1.1	7,15	1.1
3,7	3.9	4	1.7	6,7	1.1	15	1.1
4,6,7	2.8	7,10	1.7	4,6-11,14,15	1.1	15,16	1.1

Key to Themes

1. Money
3. Many Borrowed from Banks to start Business
4. Something used to produce something
5. Money to Buy Resources and pay for labour
6. Machinery
7. Goods that produce other goods
8. Buildings
9. Man-made goods used in factories
10. Machines and factories
11. Man-made products used to make products
12. The Wage or Money Value of the factors of production
14. Longterm fixed asset
15. Assets
16. Investment

Table 4.11 : Percentage of Themes of Capital Included in Personal Meanings of Capital

THEMES →	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Sixth Formers (N = 419)	16.9	1.6	19.5	32.2	8.7	28.4	56.1	12.7	10.1	20.7	27.5	4.5	1.4	13.8	16	18.1	0.2	0.2	0.2	0	0.2	0.5	0
Sixth Form Teachers (N = 14)	14.3	0	14.3	28.6	7.1	21.4	64.3	21.4	28.6	28.6	78.6	0	0	14.3	0	7.1	0	0	0	0	0	0	
Seventh Formers (N = 178)	16.9	1.1	17.4	26.4	10.1	25.3	59.6	8.4	9.6	20.8	29.2	3.9	1.1	10.7	14.0	17.4	0	0	1.6	0.5	0	0	0.6
Seventh Form Teachers (N = 21)	0	0	0	19	0	23.8	47.6	9.5	19	9.5	66.7	0	0	9.5	0	4.8	9.5	48	0	0	0	0	0

Key to Themes

1. Money
2. Bonds
3. Money Borrowed from Banks to get Business started i.e. Finance
4. Something used to Produce Goods
5. Money to Buy Resources and Pay for Labour
6. Machinery
7. Goods that Produce other Goods
8. Buildings
9. Man-made Goods used in Factories
10. Machines and Factories
11. Man-made Products Used to Make Products
12. The Wage or Money Value of the
13. Things already Produced
14. Longterm Fixed Asset
15. Assets
16. Investment
17. Something of Value Used to Produce Something of Value
18. Man-made factor used as Intermediary of final Goods
19. Value of Business
20. Things not consumed directly by consumers
21. Investment in New Technology
22. Land
23. A Resource that is both limited and necessary for Production

2. 5.6 per cent - (7)(Goods that Produce Other Goods; and

3. 4.5 per cent - (4,7) Something Used to Produce Goods, and Goods that Produce Other Goods.

It can be seen from the above data that the most commonly shared meanings between the student groups were Capital seen as Goods or Something Used to Produce Other Goods. The meanings also tended to be quite similar.

The theme that was frequently included in the personal meanings of the students (see Table 4.11) was Goods that Produce Other Goods (56.1 per cent for Sixth Formers and 59.6 per cent for Seventh Formers). Almost a third of both student groups, however, included the themes Something Used to Produce Goods (32.2 per cent for Sixth Formers; 26.4 per cent for Seventh Formers) and Man-made Products Used to Make Products (27.5 per cent for Sixth Formers; 29.2 per cent for Seventh Formers) in their personal meanings.

In general, however, there was no meaning of Capital which was shared by the majority of both student groups. The picture was rather that of a wide range of meanings of Capital possessed by both groups of students.

Economists view Capital as a product made by man and used in the production of further goods and services. Examples of such products include machines, plants, equipment and inventory. Lindauer (1977) defines Capital as "those products that can themselves be used to help produce

even more goods and services; the tools, the buildings, the hospitals, the machinery, and other things that workers use to produce goods and services". Samuelson (1964) sees it as "produced goods that can be used as factor inputs for further production", while Ammer and Ammer (1984) define Capital as "All goods that are used to produce other goods and services, including factories, machinery and equipment."

It can be seen from the above that the Economists' meaning of Capital reflects the themes (4) Something Used to Produce Goods, (7) Goods that Produce Other Goods, (11) Man-made Products Used to Make Products, and (18) Man-made Factor Used as Intermediary of Final Goods. The themes Machinery, Buildings, Machines and Factories and Things Already Produced, however, are seen by Economists as examples of Capital. Themes such as Money, Bonds, Assets, Investment and Value of Business are not considered by Economists to refer to the meaning of Capital.

> "Specifically not capital are such things as the stocks and bonds that are sometimes issued to raise money to finance the purchase of capital. Financial investments are important but cannot be employed to help produce goods and services." (Lindauer, 1977, p. 559).

It seems, however, that some students do not share the Economists' idea of Money not being regarded as Capital. Thus, some students wrote on their questionnaires:

> Capital is a good that is used to produce another good by using money,machinery and fixed assets.(469 - A Sixth Former).

> Capital is any commodity, i.e. money, machines etc that is used during the production of other goods. (467 - A Sixth Former).
>
> Capital can be in the physical sense or monetary sense i.e. a capital good. (535 - A Seventh Former).

However, it should be pointed out that Economists are not universally in agreement about the conception of Capital. For instance, Land may be referred to as an example of Capital (Samuelson, 1964; Brown, 1970) if it has been reclaimed or been improved to be productive. Brown (1970), in fact, includes as Capital anything that earns an income:

> "The family car, for example, is not income-earning and is therefore a durable consumer good. On the other hand, a taxi is income-earning and is therefore part of capital." (Brown, 1970, p.87).

If we go by the conceptions of Brown, it can be seen that Money or Land in the hands of a gambler or real estate agent is Capital because, to the gambler or the estate agent Money or Land is income-earning, that is, a good or something used to produce further goods like money. Nevertheless, the point should be made that Money and Land may be seen as examples of Capital. This, however, does not alter the Economists' meaning of Capital as Goods Used to Produce Further Goods. The problem is whether the goods should essentially be man-made. Since just over half of both student groups included in their meanings of Capital the themes Goods That Produce Other Goods, the suggestion can be made that about half of the students generally did

not know what Capital actually was. At best, they were aware of some examples of Capital, such as machinery and buildings, but not its real meaning. It should be noted, however, that the themes Goods That Produce Other Goods and Something Used To Produce Other Goods which describe Economists' meaning of Capital received a high level of agreement between both groups of students.

Teachers' Meanings of Capital: The range of themes reflecting the meanings teachers had for the term Capital was more restricted than that of the students. The meanings of Sixth Form Teachers came within a range of 12 themes (1, 3-11, 14 and 16) and 11 themes (4, 6-11, 14, 16-18) for Seventh Form Teachers. The Sixth Form Teachers had between them a total of 10 meanings or meaning combinations, of which two were shared by 42.9 per cent (n = 6) of the teachers with the remaining 57.1 per cent (n = 8) being unique (see Table 4.12). The Seventh Form Teachers indicated a total of 15 meanings or meaning combinations of which three were shared by 42.8 per cent (n = 9) of the teachers with the remaining 57.2 per cent (n = 12) being unique.

The shared meanings of the Sixth Form teachers were:

1. 28.6 per cent - (11) Man-made Products used to Make Products; and

2. 14.3 per cent - (4,7,11) Something Used to Produce Goods, Goods that Produce Other Goods and Man-made Products Used to Make Products.

Table 4.12 : Teachers' Meanings of Capital

(Percentages Indicates Rate of Shared Meanings)

Sixth Form (Total Meanings = 10)

Meaning	Rate (%)	Meaning	Meaning
11	28.6	4,7,9,10,11	7
4,7,11	14.3	6,7,10,11	7,11
1,3,8,9,14		6-11,14	16
4,6-11			

Seventh Form (Total Meanings = 15)

Meaning	Rate (%)	Meaning	Meaning
11	23.8	4,6,7,9,11	6
7	9.5	4,11	7,9,11
17	9.5	6,7,11	7,14
4,7,11		6,7,8,10,11,14	11,16
4,7,9		6-11	18

Key to Themes

1. Money
3. Money borrowed from banks to start business
4. Something used to produce goods
5. Money to buy resources and pay for labour
6. Machinery
7. Goods that produce other goods
8. Buildings.
9. Man-made goods used in factories
10. Machines and Factories
11. Man-made products used to make products
14. Longterm fixed asset
16. Investment
17. Something of Value used to produce something of value
18. Man-made factor used as intermediary of final goods.

The shared meanings of the Seventh Form Teachers were:

1. 23.8 per cent - (11) Man-made Products Used to Make Products;

2. 9.5 per cent - (7) Goods that Produce Other Goods; and

3. 9.5 per cent - (17) Something of Value to Produce Something of Value.

It is obvious from the above that the most commonly shared meaning between the two groups of teachers is Capital seen as Man-Made Products Used to Make Products. And, as Table 4.11 shows, over two-thirds of both groups of teachers (78.6) per cent for Sixth Form Teachers and 66.7 per cent of Seventh Form Teachers) included the theme Man-made Products Used to Make Products in their meanings of Capital. In addition, about two-thirds of the Sixth Form Teachers (64.3 per cent) included the theme Goods that Produce Other Goods in their meanings of Capital, while almost half of the Seventh Form Teachers (47.6 per cent) did so. Since Economists' meaning of Capital reflects the themes Goods That Produce Other Goods or Man-made Products Used to Make Products, the suggestion can be made that over two-thirds of the teachers generally possess the Economists' meaning of Capital. However, it should be noted that the teachers generally seemed to conceive of Capital more in terms of Man-made Products Used to Make Products than Goods That Produce Other Goods.

Comparison of Student and Teacher Meanings: A majority of both students and teachers generally shared the Economists' meanings of Capital. Over half of the students included the theme Goods that Produce Other Goods (56.1 per cent for Sixth Formers; 59.6 per cent for Seventh Formers) in their personal meanings, while over two-thirds of the teachers did so for the theme Man-made Products Used to Make Products. There was a significant difference, however, between the teachers and students regarding the nature of the meaning of Capital. While over two-thirds of the teachers (78.6 per cent of Sixth Form Teachers and 66.7 per cent of Seventh Form Teachers) viewed Capital from the theme Man-made Products Used to Make Products, less than a third of the students (27.5 per cent of Sixth Formers and 29.2 per cent of Seventh Formers) did so. This suggests that teachers tended to have a conception of Capital restricted to man-made goods while students tended to have a wider conception since "goods" can refer to both natural goods such as the sea, or crude oil, as well as man-made ones like machines. As mentioned earlier Economists' meaning of Capital is not universally agreed upon. For instance, while Lindauer (1977) and Samuelson (1964) refer to "produced" or man-made products, Ammer and Ammer (1984) and Humphreys (1975) refer simply to "goods" used to produce further goods and services, which is similar to Brown's (1970) conception of Capital as anything that is income-earning.

THE MEANING OF MARGINAL RETURNS

The Thematic Conceptualizations of Marginal Returns

Figure 4.7 below describes the 12 themes that came up from the analysis of the transcripts on the term Marginal Returns (see Appendix 1D).

Marginal Returns seen as:
1. Making a Profit
2. Breaking Even
3. Limit to Production
4. Extra Production
5. Increase in Production
6. Increase in a Factor of Production
7. Decrease in a Factor of Production
8. Difference Between Two Stages of Production
9. Income From Investment
10. Decrease in Production
11. Total Production, and
12. Fixed Factor of Production

Figure 4.7: Themes of Marginal Returns in Phase 1 of Study

The themes that were frequently used by students in Phase 1 of the study to elucidate their meanings of Marginal Returns were Making a Profit and Increase in a Factor of Production as shown by the following statements:

> This is the income from investment which is profit. Say, you invest $1000 in business and you make $100 profit or income, that's your Marginal Return.(604 - A Sixth Former).

> Marginal Return is the return you can get back just to make a profit and not making anything extra just to cover your cost. It would be the gap between the cost of production and what you can get back from it. As a margin, as a gap, how much it cost you, and how much you're getting back as profit. And the bigger the gap is, the bigger the margin. (P03 - A Seventh Former).

> It's really when, we take an example, say like labour. We have a certain amount of labour, say in a field or something. But if we add some more labour to it, we might not necessarily get, say, if we increase the labour twice we might not necessarily get twice the output or the return from that particular group. (707 - A Seventh Former).
>
> Marginal Returns are the returns, either decreasing or increasing, that you're getting from production by bringing in more of a factor of production. (601 - A Sixth Former).

Other themes which were used more often included Increase in Production, Income from Investment and Difference between Two Stages of Production. The following statements made by the students in Phase 1 illustrate the above themes:

> It is the increase in production of adding an extra factor of production to a fixed factor of production. (Note reference to theme Increase in factor of production). (706 - A Seventh Former).
>
> Marginal Return is the income from investment. (604 - A Sixth Former).
>
> This is the difference between, say, you produce a certain amount of output using a set of factors of production. Then you change the set of the factors of production and you get another output. Marginal Return is the difference of outputs between the two sets of production. Marginal Return is really the difference between two stages of production. (007 - A Seventh Former).

Other themes, such as Limit to Production and Breaking Even, were used by one or two students only to describe their meanings. Student 605 did not remember what the term meant, but remembered having been exposed to it in the classroom.

In general, the conceptions of students on the term Marginal Returns tended to differ from one student to another, though the concept of Marginal Returns as making a profit or having to do with production output were shared by many.

The Results of the Survey on Marginal Returns

Reactions to the 12 Themes: Table 4.13 summarises the levels of agreement of the large sample of students and teachers who were asked to react to the 12 themes in Phase 2 of the study. As the Table shows, none of the themes received a high agreement level among the students. In the case of the teachers, only the theme Extra Production received a high agreement level between both groups ($\overline{X}$ = 5.15, SD = 1.57 for Sixth Form Teachers and $\overline{X}$ = 5.37, SD = 1.84 for Seventh Form Teachers) with almost one-third of the teachers (30.8 per cent for Sixth Form Teachers, and 31.6 per cent for Seventh Form Teachers) completely agreeing to the theme. In addition, the Seventh Form Teachers indicated a high agreement level ($\overline{X}$ = 5.21, SD = 1.81) for the theme Increase in Production with almost a quarter (21.1 per cent) demonstrating a complete agreement.

Three themes received low agreement levels among the students. These were:

1. Decrease in a Factor of Production - $\overline{X}$ = 2.53, SD = 8.84 (Sixth Formers) and $\overline{X}$ = 2.71, SD = 7.21 (Seventh Formers) with over a quarter (26.0 per cent and 28.0 per cent respectively) showing complete disagreement.

Table 4.13 : Indications of Levels of Agreement with Themes of Marginal Returns

(N : 6th Form Students = 426; 7th Form Students = 178; 6th Form Teachers = 14; 7th Form Teachers = 21)

(In Percentages)

THEMES			7	6	5	4	3	2	1	Mean	S.D.
1. MAKING A PROFIT	6th F	Students	11.7	22.2	25.7	17.1	10.0	6.1	7.1	4.62	8.46
	7th F	Students	6.9	17.7	20.6	20.0	14.9	13.7	6.3	4.15	5.25
	6th F	Teachers	7.7	7.7		7.7	15.4	7.7	53.8	2.46	1.84
	7th F	Teachers			10.5			26.3	63.2	1.68	2.85
2. BREAKING EVEN	6th F	Students	3.9	12.2	13.9	20.7	16.5	14.8	18.0	3.50	8.35
	7th F	Students	4.6	5.1	9.1	23.4	16.6	21.1	20.0	3.14	5.53
	6th F	Teachers	7.7		7.7	7.7			76.9	2.00	2.63
	7th F	Teachers				5.3	5.3	15.8	73.7	1.42	3.14
3. LIMIT TO PRODUCTION	6th F	Students	3.7	9.6	17.4	16.2	23.8	16.5	12.8	3.53	8.20
	7th F	Students	2.3	1.1	8.6	22.9	18.3	25.7	21.1	2.85	5.89
	6th F	Teachers	7.7			15.4		7.7	69.2	2.00	2.39
	7th F	Teachers			5.3	5.3		15.8	73.7	1.59	3.15
4. EXTRA PRODUCTION	6th F	Students	12.0	18.3	21.2	17.3	13.2	11.5	6.6	4.38	7.98
	7th F	Students	13.7	22.3	22.9	14.3	9.7	9.7	7.4	4.57	5.29
	6th F	Teachers	30.8	7.7	38.5	7.7	7.7		7.7	5.15	1.57
	7th F	Teachers	31.6	31.6	10.5	10.5	5.3	5.3	5.3	5.37	1.84
5. INCREASE IN PRODUCTION	6th F	Students	4.2	14.7	23.5	24.2	15.6	9.8	8.1	4.06	8.46
	7th F	Students	4.0	14.9	24.6	20.6	14.3	11.4	10.3	3.98	5.37
	6th F	Teachers		23.1	15.4	7.7	15.4	7.7	30.8	3.38	1.30
	7th F	Teachers	21.1	36.8	15.8	10.5	5.3	5.3	5.3	5.21	1.81
6. INCREASE IN A FACTOR OF PRODUCTION	6th F	Students	4.9	13.2	17.4	23.3	18.9	11.3	11.0	3.84	8.14
	7th F	Students	1.7	8.0	20.6	24.0	18.3	15.4	12.0	3.57	5.49
	6th F	Teachers	7.7		15.4		7.7		69.2	2.25	2.39
	7th F	Teachers	5.3	5.3	10.5	5.3	10.5		63.2	2.68	2.68

			7	6	5	4	3	2	1	Mean	S.D.
7. DECREASE IN A FACTOR OF PRODUCTION	6th F	Students	2.5	5.6	7.4	15.2	21.6	21.8	26.0	2.53	8.84
	7th F	Students	0.6	1.7	10.3	20.0	18.3	21.1	28.0	2.71	7.21
	6th F	Teachers					7.7	7.7	84.6	1.23	2.91
	7th F	Teachers			5.3	5.3	10.5	10.5	68.4	1.68	2.90
8. DIFFERENCE BETWEEN TWO STAGES OF PRODUCTION	6th F	Students	6.1	11.0	15.9	18.0	14.6	16.1	18.3	3.54	7.89
	7th F	Students	10.3	17.7	12.6	15.4	16.0	17.1	10.9	3.96	4.99
	6th F	Teachers	7.7	15.4	23.1	7.7	7.7		38.5	3.54	1.47
	7th F	Teachers	26.3	15.8		21.1		15.8	21.1	4.16	1.72
9. INCOME FROM INVESTMENT	6th F	Students	5.6	14.7	17.9	17.2	16.4	14.0	14.2	3.77	7.84
	7th F	Students	4.0	6.9	13.8	16.1	13.8	20.7	24.7	3.10	5.41
	6th F	Teachers	7.7		7.7	7.7		15.4	61.5	2.15	2.11
	7th F	Teachers	5.3	5.3		10.5		26.3	52.6	2.16	2.43
10. DECREASE IN PRODUCTION	6th F	Students	2.2	6.1	7.8	15.6	19.3	23.7	25.2	2.84	8.80
	7th F	Students	1.7	2.3	8.0	13.1	18.3	27.4	29.1	2.57	6.10
	6th F	Teachers			7.7	7.7	7.7	23.1	53.8	1.92	1.92
	7th F	Teachers	15.8	10.5		5.3	10.5	5.3	52.6	2.89	2.29
11. TOTAL PRODUCTION	6th F	Students	3.9	8.3	12.9	21.2	17.6	14.1	22.0	3.30	8.27
	7th F	Students	0.6	2.3	8.0	18.9	18.9	21.1	30.3	2.62	6.04
	6th F	Teachers			7.7	7.7		7.7	76.9	1.62	2.63
	7th F	Teachers					15.8	5.3	78.9	1.37	3.37
12. FIXED FACTOR OF PRODUCTION	6th F	Students	2.2	4.4	9.3	20.0	21.8	19.3	23.0	2.96	7.71
	7th F	Students	1.1	1.7	3.4	14.9	19.4	29.7	29.7	2.42	6.38
	6th F	Teachers						23.1	76.9	1.23	2.72
	7th F	Teachers				5.3	15.8		78.9	1.47	3.37

Note: 7 = Completely Agree; 1 = Completely Disagree

2. Decrease in Production - $\overline{X}$ = 2.84, SD = 8.80 (Sixth Formers) and $\overline{X}$ = 2.57, SD = 6.10 (Seventh Formers) with over a quarter (25.2 per cent and 29.1 per cent respectively) showing complete disagreement.

3. Fixed Factor of Production - $\overline{X}$ = 2.96, SD = 7.71 (Sixth Formers) and $\overline{X}$ = 2.42, SD = 6.38 (Seventh Formers) with about a quarter (23.0 per cent and 29.7 per cent respectively) indicating complete disagreement.

In addition, the themes Limit to Production ($\overline{X}$ = 2.85, SD = 5.89) and Total Production ($\overline{X}$ = 2.62, SD = 6.04) received low agreement levels among the Seventh Formers with almost a third (30.3 per cent) completely disagreeing with the latter theme.

There were nine cases of low agreement levels in the case of the teachers. These included:

1. Making a Profit - $\overline{X}$ = 2.46, SD = 1.84 (Sixth Form Teachers) and $\overline{X}$ = 1.68, SD = 2.85 (Seventh Form Teachers) with over half of the Sixth Form Teachers (53.8 per cent) and almost two-thirds of the Seventh Form Teachers (63.2 per cent) showing complete disagreement.

2. Breaking Even - $\overline{X}$ = 2.00, SD = 2.63 (Sixth Form Teachers) and $\overline{X}$ = 1.42, SD = 3.14 (Seventh Form Teachers) with about three-quarters of the

teachers (76.9 per cent of Sixth Form Teachers, 73.7 per cent of Seventh Form Teachers) completely disagreeing.

3. Limit to Production - $\overline{X}$ = 2.00, SD = 2.39 (Sixth Form Teachers) and $\overline{X}$ = 1.59, SD = 3.15 (Seventh Form Teachers) with over two-thirds of the Sixth Form Teachers (69.2 per cent) and about three-quarters of the Seventh Form Teachers (73.7 per cent) showing complete disagreement.

4. Increase in a Factor of Production - $\overline{X}$ = 2.25, SD = 2.39 (Sixth Form Teachers) and $\overline{X}$ = 2.68, SD = 2.68 (Seventh Form Teachers) with about two-thirds of both groups (69.2 per cent and 63.2 per cent respectively) completely disagreeing.

5. Decrease in a Factor of Production - $\overline{X}$ = 1.23, SD = 2.91 (Sixth Form Teachers) and $\overline{X}$ = 1.68, SD = 2.90 (Seventh Form Teachers) with almost all the Sixth Form Teachers (84.6 per cent) and two-thirds of the Seventh Form Teachers (68.4 per cent) completely disagreeing.

6. Income from Investment - $\overline{X}$ = 2.15, SD = 2.11 (Sixth Form Teachers) and $\overline{X}$ = 2.16, SD = 2.43 (Seventh Form Teachers) with almost two thirds of the Sixth Form Teachers (61.5 per cent) and half of the Seventh Form Teachers (52.6 per cent) showing complete disagreement.

7. Decrease in Production - $\overline{X}$ = 1.92, SD = 1.92 (Sixth Form Teachers) and $\overline{X}$ = 2.89, SD = 2.29 (Seventh Form Teachers) with half of the teachers (53.8 per cent and 52.6 per cent respectively) completely disagreeing.

8. Total Production - $\overline{X}$ = 1.62, SD = 2.63 (Sixth Form Teachers) and $\overline{X}$ = 1.37, SD = 3.37 (Seventh Form Teachers) with three quarters of both groups of teachers (76.9 per cent and 78.9 per cent respectively) completely disagreeing.

9. Fixed Factor of Production - $\overline{X}$ = 1.23, SD = 2.72 (Sixth Form Teachers) and $\overline{X}$ = 1.47, SD = 3.37 (Seventh Form Teachers) with three quarters of both groups of teachers (76.9 per cent and 78.9 per cent respectively) completely disagreeing.

1. Making a Profit
2. Breaking Even
3. Limit to Production
4. Extra Production
5. Increase in Production
6. Increase in a Factor of Production
7. Decrease in a Factor of Production
8. Difference between Two Stages of Production
9. Income from Investment
10. Decrease in Production
11. Total Production
12. Fixed Factor of Production
13. Increase in Production due to a Unit Increase in a Factor of Production with others Fixed
14. Return on the Last Unit Produced
15. Satisfaction Derived from Consumption
16. Making a Better Return than before on an Increase in Investment
17. Diminishing Returns on Investment
18. Variation of Production in order to find the Optimum Point of Efficiency
19. The Amount over and above the Normal Production of a Good or Service

Figure 4.8: Themes of Marginal Returns from Parts A and B of Questionnaire

Students Personal Meanings of Marginal Returns:

The opportunity given to both students and teachers in Section B to indicate other ideas they had about Marginal Returns and not given in Section A of the questionnaire, saw the emergence of an additional seven themes about Marginal Returns. This, therefore, resulted in a total of 19 themes on Marginal Returns. Figure 4.8 presents the 19 themes.

The personal meanings of the students covered the whole 19 themes, with the meanings of the Sixth Formers reflected by 18 themes (1-15, 17-19) and 16 themes (1-14, 16, 18) for the Seventh Formers). The Sixth Formers had between them a total of 142 meanings or meaning combinations for the term Marginal Returns though 36 of them, or 8.5 per cent, did not indicate any meaning. Of the 142 meanings or meaning combinations, 64 were shared by 80 per cent of the students (n = 312) while 20 per cent (n = 78) had unique meanings or meaning combinations (see Appendix 2D). The total meanings or meaning combinations of Seventh Formers were 77 with 30 of them indicating no meaning. Of the 77 meanings, 28 were shared by 69.6 per cent of the Seventh Formers (n = 110) with 30.4 per cent (n = 48) being unique meanings (see Appendix 2D).

Table 4.14 summarises the meanings that were shared by both student groups. It can be seen from the Table that only three meanings or meaning combinations had a rate of above four per cent among the Sixth Formers.

Table 4.14 : Percentages of Students' Shared Meanings of Marginal Returns

Sixth Form (Total Shared Meanings = 64)

Meaning	Rate (%)	Meaning	Rate	Meaning	Rate	Meaning	Rate
1	7.9	1,2,9	1.3	3	0.8	5,13	0.5
1,9	4.4	1,8	1.3	3,9	0.8	4,14	0.5
4	4.4	1,5	1.3	3,8	0.8	4,9	0.5
1,2	3.6	2,3	1.3	5	0.8	4,5,9	0.5
2	3.1	4,8	1.3	2,10	0.8	4,8,11	0.5
1,4	2.8	1,3	1.0	1,3,4	0.5	4,12	0.5
6	2.8	4,13	1.0	1,4,6	0.5	4,5,6	0.5
9	2.8	5,9	1.0	1,2,8	0.5	4,5,11	0.5
4,5	2.6	8,9	1.0	1,9,11	0.5	6,8	0.5
8	2.6	1,4,12	0.8	1,5.9	0.5	6,7	0.5
4,6	2.3	1,7	0.8	3,10	0.5	7	0.5
1,4,9	2.1	1,11	0.8	3,4,6,7,10	0.5	6,13	0.5
1,6	2.1	1,11,12	0.8	3,12	0.5	7,13	0.5
2,9	2.1	1,12	0.8	3,6	0.5	8,13	0.5
5,6	1.5	2,7	0.8	2,4	0.5	9,11	0.5
13	1.5	2,8	0.8	4,5,8	0.5	17	0.5

Seventh Form (Total of Shared Meanings = 28)

Meaning	Rate (%)	Meaning	Rate	Meaning	Rate	Meaning	Rate
8	9.5	4,8	2.5	1,2	1.3	4,9	1.3
4	5.7	2,4	1.9	1,4,5	1.3	4,5,8,14	1.3
14	5.7	4,5,6,13	1.9	1,8	1.3	5,6	1.3
1,4	4.4	5	1.9	1,14	1.3	5,10	1.3
1	3.8	6	1.9	2	1.3	5,13	1.3
4,5	3.2	7	1.9	3,4	1.3	6,8	1.3
4,13	3.2	13	1.9	4,6,13	1.3	8,9	1.3

Key to Themes

1. Making a Profit
2. Breaking Even
3. Limit to Production
4. Extra Production
5. Increase in Production
6. Increase in Factor of Production
7. Decrease in Factor of Production
8. The Difference Between Two Stages of Production
9. Income from Investment
10. Decrease in Production
11. Total Production
12. The Fixed Factor of Production
13. Increase in Production due to a Unit Increase in a Factor of Production with other factors fixed
14. Return on the last unit produced
17. Diminishing Returns on Investment

These were:

1. 7.9 per cent - (1) Making a Profit

2. 4.4 per cent - (1,9) Making a Profit and Income from Investment, and

3. 4.4 per cent - (4) Extra Production

In the case of the Seventh Formers, four meanings or meaning combinations had a rate above four per cent. These were:

1. 9.5 per cent - (8) Difference between Two Stages of Production

2. 5.7 per cent - (4) Extra Production

3. 5.7 per cent - (14) Return on the Last Unit Produced, and

4. 4.4 per cent - (1,4) Making a Profit and Extra Production

As the Table shows, the commonly shared meaning between both groups of students, was the meaning (4) Extra Production, perhaps, best illustrated by the statement below:

> The extra return, extra production you get when you increase a fixed factor like labour. Something that sees extra production you get with increasing labour. (701 - A Seventh Former in Phase 1 of the study)

No one meaning or meaning combination, however, enjoyed a dominance in either student group. Rather, the picture

Table 4.15 : Percentages of Themes of Marginal Returns Included in Personal Meanings of Marginal Returns

THEMES →	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Sixth Formers (N = 390)	39.6	16.6	12.2	28.6	15.9	18.8	6.4	14.7	20	4.9	8.6	4.2	6.8	1.9	0.2	0	0.5	0.2	0.5
Sixth Form Teachers (N = 14)	8.3	7.7	7.7	61.5	7.7	15.4	0	23.1	0	0	0	0	7.1	7.1	0	0	0	0	0
Seventh Formers (N = 178)	27.7	8.6	6.9	39.7	20.1	17.2	5.2	24.7	13.2	4.6	2.3	1.7	12.9	9	0	0.6	0	0.6	0
Seventh Form Teachers (N = 21)	0	0	0	38.1	14.3	4.8	0	28.6	0	0	0	0	42.9	4.7	0	0	0	0	0

Key to Themes

1. Making a Profit
2. Breaking Even
3. Limit to Production
4. Extra Production
5. Increase in Production.
6. Increase in the Factor of Production.
7. Decrease in the Factor of
8. The Difference Between Two Stages of Production.
9. Income from Investment
10. Decrease in Production
11. Total Production
12. The Fixed Factor of Production.
13. Increase in Production Due to a Unit Increase in a Factor of Production with Others fixed.
14. Return on the Last Unit Produced
15. Satisfaction Denied from Consumption.
16. Making a Better Return than Before on an Increase in Investment.
17. Diminishing Returns on Investment.
18. The Variation of Production in Order to find the Optimum Point of Efficiency.
19. The Amount over and above the normal Production of a Good or Service.

was of a wide pattern of different meanings or meaning combinations.

Table 4.15 summarises the themes that were included in the personal meanings of both students and teachers. As the Table shows, there was no theme which a majority of both student groups included in their personal meanings. It is of interest to note that none of the given themes in Section A of the questionnaire received a high level of agreement by either group of students. However, the two themes that ranked highest in the personal meanings of students were Making a Profit (39.6 per cent for Sixth Formers and 27.7 per cent for Seventh Formers) and Extra Production (28.6 per cent for Sixth Formers and 39.7 per cent for Seventh Formers).

Economists view the concept of Marginal Returns or Product as the extra production (Samuelson, 1964) or the increase in production (Lindauer, 1977) of a factor of production when a unit of that factor of production is increased with the other factors of production held constant. Thus, if two labourers produce 100 crates a day, and the hiring of a third labourer, with other factors of production fixed, results in a total production of 160 crates, the Marginal Returns or Product is 60 crates. This is the difference between the production of the two labourers and the three labourers, or the difference between 100 and 160 crates. Marginal Returns could, therefore, be regarded as the difference between two stages of production (Samuelson, 1964).

The Economists' meaning of Marginal Returns, therefore, reflects the combination of the themes Extra Production (4), Increase in Production (5), Increase in a Factor of Production (6) and the Fixed Factor of Production (12). This meaning combination is illustrated by Samuelson's definition:

> "The marginal product of a productive factor is the extra product or output added by one extra unit of that factor, while other factors are being held constant" (Samuelson, 1964, p. 518).

The Economists' meaning also reflects the themes Difference between Two Stages of Production (8) and Increase in Production due to a Unit Increase in a Factor of Production with Others Fixed (13), with these two themes, on their own, reflecting an appropriate meaning of Marginal Returns. Since less than a quarter of the students included the themes Difference between Two Stages of Production (14.7 per cent for Sixth Formers and 24.7 per cent for Seventh Formers) and Increase in Production due to a Unit Increase in a Factor of Production with Others Fixed (6.8 per cent for Sixth Formers and 12.9 per cent for Seventh Formers) in their personal meanings, the suggestion could be made that about three-quarters of the students did not understand the meaning of Marginal Returns from the Economists' point of view. This is compounded, too, by the fact that less than a third of the students included the themes Extra Production (28.6 per cent for Sixth Formers and 39.7 per cent for Seventh Formers) and Increase in Production (15.9 per cent for Sixth Formers and 20.1 per cent for Seventh Formers) in

their personal meanings. Also, the theme Difference Between Two Stages of Production did not receive a high level of agreement with the students.

The inclusion of the theme Making a Profit (39.6 per cent of Sixth Formers and 27.7 per cent of Seventh Formers) in many of the students' personal meanings suggests that many students have an everyday meaning for the term Marginal Returns, in the sense that the word "returns" in everyday usage, also means profits.

Teachers' Meanings of Marginal Returns: Teachers revealed a small range of themes, nine for the Sixth Form Teachers (1-6,8,13 and 14) and six for the Seventh Form Teachers (4-6,8,13 and 14). There was a total of six meanings or meaning combinations between the Sixth Form Teachers and eight for the Seventh Form Teachers. The meanings of both groups of teachers are presented in Table 4.16. Of the six meanings between the Sixth Form Teachers, three were shared by 75.0 per cent (n = 9) of the teachers with 25.0 per cent (n = 3) being unique meanings. Two of the Sixth Form Teachers did not indicate their meanings. The shared meanings included:

1. 33.3 per cent - (4) Extra Production

2. 25.0 per cent - (4,8) Extra Production and Difference between Two Stages of Production, and

3. 16.7 per cent - (4,6) Extra Production and Increase in a Factor of Production.

Table 4.16 : Teachers' Meanings of Marginal Returns

(Percentages Indicate Rate of Shared Meanings)

Sixth Form (Total Meanings = 6)

Meaning	Rate (%)	Meaning
4	33.3	1,2,3
4,8	25.0	13
4,6	16.7	14

Seventh Form (Total Meanings = 8)

Meaning	Rate (%)	Meaning
13	38.1	4,5
4	14.3	4,13
4,8	14.3	6
8	14.3	14

Key to Themes

1. Making a Profit
2. Breaking Even
3. Limit to Production
4. Extra Production
5. Increase in Production
6. Increase in factor of production
8. The difference between two stages of production
13. Increase in production due to a unit increase in a factor of production with others fixed
14. Return on last unit produced

Of the eight meanings between the Seventh Form Teachers, four were shared by 81.0 per cent (n = 17) of the teachers with 19 per cent (n = 4) being unique meanings. The shared meanings were:

1. 38.1 per cent - (13) Increase in Production due to a Unit Increase in a Factor of Production with Others Fixed.

2. 14.3 per cent - (4) Extra Production

3. 14.3 per cent - (4,8) Extra Production and Difference between Two Stages of Production, and

4. 14.3 per cent - (8) Difference between Two Stages of Production.

The commonly shared meaning between the two groups of teachers was the meaning combination of (4) and (8) - Extra Production and Difference between Two Stages of Production. From the Table, it can be seen that one-third of the Sixth Form Teachers' meaning for Marginal Returns was indicated by the theme Extra Production and another one-quarter the combination of Extra Production and Difference between Two Stages of Production. Over one-third of the Seventh Form Teachers, however, indicated as their meaning the theme Increase in Production due to a Unit Increase in a Factor of Production with Others Fixed. No single meaning or meaning combination, however, was indicated by a majority in both groups of teachers.

The theme Extra Production was included by almost

two-thirds of the Sixth Form Teachers (61.5 per cent; see Table 4.15) in their personal meanings of Marginal Returns. It should be noted that this theme represented the meaning of one-third of Sixth Form Teachers. In comparison, only one-third of the Seventh Form Teachers (38.1 per cent) included it in their meanings. The theme Increase in Production Due to a Unit Increase in a Factor of Production with Others Fixed was included by almost half of the Seventh Form Teachers (42.9 per cent) in their personal meanings for the term Marginal Returns. The same theme also accounted for over one-third of the total meanings of the Seventh Form Teachers. In contrast, very few of the Sixth Form Teachers (7.1 per cent) included it in their meanings.

Since Economists' meaning of Marginal Returns is reflected by the themes Difference between Two Stages of Production or Increase in Production due to a Unit Increase in a Factor of Production with Others Fixed, the suggestion can be made that over three-quarters of the Sixth Form Teachers do not share the Economists' meanings. Note that only about one-quarter (23.1 per cent) of the Sixth Form Teachers included the theme Difference between two stages of production in their meanings. Moreover, this same theme did not receive a high level of agreement with the teachers. Since almost half of the Seventh Form Teachers included the theme Increase in Production Due to a Unit Increase in a Factor of Production with Others Fixed in their personal meanings (42.9 per cent), the suggestion, then, is that about half of the Seventh Form Teachers share the Economists

meanings of Marginal Returns. Though a majority of the Sixth Form Teachers (61.5 per cent) included the theme Extra Production in their meanings, it should be noted that the theme represents a part of the whole meaning of Marginal Returns.

Comparison of Student and Teacher Meanings: There were significant differences between the meanings of both students and teachers in the sense that very few students, compared to the teachers, shared the Economists' viewpoint about Marginal Returns. For instance, while about a quarter of the Sixth Form Teachers (23.1 per cent) included the theme Difference between Two Stages of Production, very few of the Sixth Form students did so (14.7 per cent). While about half of Seventh Form Teachers (42.9 per cent for theme 13) shared the Economists' meaning of Marginal Returns, only a quarter of the Seventh Formers (24.7 per cent for theme 8) did so. It should also be noted that while many students viewed Marginal Returns in terms of Making a Profit (39.6 per cent for Sixth Formers and 27.7 per cent for Seventh Formers), almost none of the teachers (8.3 per cent for Sixth Form Teachers and 0.0 per cent for Seventh Form Teachers) did so. Moreover, even though over two-thirds of the Sixth Form Teachers (61.5 per cent) viewed Marginal Returns in terms of Extra Production, only about one-third of the Sixth Formers (28.6 per cent) did so. The suggestion that can be made from the analysis of the comparison between the meanings of the students and teachers, is that the Economists' meaning of Marginal Returns is not being

translated effectively to the students by their teachers. Especially disturbing is the fact that despite exposure to the term by their teachers, students continued to view it from an everyday perspective. However, it should be pointed out that earlier on in Phase 1 of the study, the teachers interviewed had indicated the difficulty of teaching this term to students and also the difficulty of students' understanding the concept. This is, perhaps, highlighted by a Sixth Form Teacher who commented on the questionnaire:

> The sixth form Economics class have not encountered the term "Marginal" although the concept has been used with the description of "extra". They will therefore not have any sense of the last question. With a very mixed class at this level there are advantages in keeping the terminology as simple as possible. (174 - A Sixth Form Teacher).

A Seventh Form Teacher who indicated teaching at Sixth Form level as well, wrote on the questionnaire two definitions of Marginal Returns, one for the Sixth Formers and the other for Seventh Formers:

> 1. The additional production resulting from input of an additional unit of a factor of production - suitable for 7th Form.
>
> 2. The extra production resulting from a change in production - more suitable for the 6th Form. (565 - A Seventh Form Teacher).

The indication is that both teachers are confirming the difficulty of teaching the concept at the Sixth Form level, and the Sixth Formers' difficulty of understanding it. In recognition of this difficulty, the teachers had made attempts to provide certain solutions such as introducing

the concept "extra". But the question is: To what extent does the solution help students' understanding of the concept? In other words, does the use of "extra" convey the Economists' concept of the "margin" to the students? However, the problem becomes complex when it is noted that many teachers, as indicated by the study, do not fully demonstrate the Economists' meaning of Marginal Returns.

CHAPTER FIVE

SUMMARY AND CONCLUSIONS

The present research was designed to investigate (a) the concepts that Sixth and Seventh Form Economics Students and their Teachers associated with terms that featured in the teaching of Economics in the classroom, and (b) to examine the nature of match, if any, of these meanings with those held by Economists. To this end, qualitative and quantitative methodologies were employed to determine the conceptions that students and teachers had for the terms Economics, Price, Capital and Marginal Returns. A qualitative approach uncovered the meanings held by a small sample of Sixth and Seventh Form students. This set of meanings was subsequently presented in a questionnaire to a large sample of Sixth and Seventh Form Economics Students and Teachers who were asked to indicate the extent to which the set of meanings reflected their own. In addition, the large sample was asked to record any personal meanings for the terms that were not given in the survey questionnaire. The teachers were also asked in the survey to state how they would want their students to define the four terms. It was hoped that the research would provide empirical evidence, sufficient and clear-cut, to indicate the nature of the meanings carried by students and teachers, as well as how these compared with each other and with the meanings of Economists for the same terms.

The present chapter summarises the results of the research and examines the educational and research implications of the findings.

LIMITATIONS OF THE DESIGN

Any conclusions that may be drawn from the research findings should be balanced against two limitations in the research design. First, the qualitative method was specifically designed to provide a basis for the quantitative methodology of the study, the main purpose being to enhance the survey's credibility. However, the limitations of questionnaire-type items must be borne in mind, namely, one cannot be certain that responses are truly representative of the total attitudinal and conceptual picture possessed by each respondent.

Second, because of time and logistical constraints, it was not possible to visit schools to interview personally a sizable number of Sixth and Seventh Form Students and their teachers as a follow-up to the survey questionnaire. Ideally, this should have occurred so that written responses could have been teased out more through probing questions, ambiguities could have been cleared up, and reasons behind certain responses (e.g., unique responses) could have been established. As it was, the researcher had to be satisfied with the data derived from the survey-questionnaire. Recognizing the limitations referred to above, it was hoped that significant information for teachers and curriculum developers would emerge from the study.

SUMMARY OF FINDINGS

In the last chapter, the results of the study were presented and discussed. This presentation included both qualitative and quantitative phases of the study, the viewpoints of Economists regarding each of the four concepts, namely, Economics, Price, Capital and Marginal Returns, and the relationships between the meanings for these concepts by students, teachers and Economists. Each section of the last chapter concluded with a comparison between student and teacher meanings for the concept under consideration.

The present summary is organised in five main sections. The first four sections concern a review of the similarities and differences between:

1. the qualitative and quantitative phases of the study;

2. the conceptions of Sixth and Seventh Form Students about the four Economics terms;

3. the conceptions of Sixth and Seventh Form Teachers about the same four terms; and

4. how the conceptions of the students and teachers compared on the four terms.

The summary concludes with an analysis of the educational and research implications of the study.

The Qualitative and Quantitative Phases of the Study

The outcome of the qualitative phase regarding the conceptions of the students for the four Economics terms were largely matched in the quantitative phase. In both phases, for example, the following patterns were found for the three concepts Economics, Price and Marginal Returns:

Economics : Rather than a core of common meanings being evident the position was one of much variation across both phases, though many students in Phase 1 tended to refer to the theme of Money.

Price: For both phases students largely expressed a meaning of Price reflecting the themes Amount of Money Paid for Goods and Services and Cost of Good/Service.

Marginal Returns: The common meaning between the students in both phases was Making a Profit, though in Phase 2 many students referred to Extra Production as well.

Another common thread between the qualitative and quantitative aspects of the study was found with respect to the high percentage overall of both Sixth and Seventh Form Students who, in their response to the survey questions for each of the four Economics terms, agreed with the themes that had been gleaned from the original small sample of students.

Furthermore, when students were given the opportunity in Part B of the survey questionnaire to add any other personal meanings they had for a given Economics term, it

was significant that, in the main, both Sixth and Seventh Formers seemed to lean towards the original themes obtained from the qualitative phase of the study. It must be noted, however, that students did add other meanings in the quantitative phase.

However, there were some differences. While in the qualitative phase the small sample of students tended to see Capital largely in terms of Money, the picture of Capital in the quantitative phase tended to reflect the theme Goods That Produce Other Goods. Moreover, while only one student in the first phase described Marginal Returns in terms of Extra Production, this very theme was one of the two themes that ranked highest in the students' conceptions of Marginal Returns in the second phase. Another area of difference was that the themes that eventuated from Phase 1 of the study did no constitute the only conceptualizations of each of the four terms used in the study. Thus the quantitative phase saw the emergence of additional themes - 10 on the term Economics, 9 on Price, 7 on Capital and 7 on Marginal Returns.

Despite the similarities between the two phases it should be made clear that each phase on its own, would not have been enough to be used as the only framework to investigate the nature of the students' conceptions about the four Economics terms. The qualitative phase alone would have been inadequate to be used to describe the general picture of the student meanings and conceptions and determine their levels of agreement for each term, while the

quantitative phase would also have experienced the shortcoming of not portraying the conceptions of students from their own perspectives. In spite of the differences, however, and the limitations of each methodology, the results of both phases tended to be similar so that it could be suggested that one phase acted as a kind of validation for the other.

The Sixth and Seventh Form Students' Conceptions

In general, the conceptions of the Sixth and Seventh Form Students on the four Economics terms tended to be very similar in terms of:

1. the levels of agreement both groups had for the themes related to each Economics concept in Part A of the survey questionnaire;

2. the spread of the themes reflecting their personal meanings for each concept;

3. the nature of the patterns of meanings, both unique and shared, reflecting each concept;

4. the frequency with which themes were included in personal meanings for each concept; and

5. the relationships between their meanings for each concept and those of Economists.

Levels of Agreement for Themes: Both groups of students tended to indicate similar levels of agreement, namely, high, middle or low, for the themes that emerged in

CONCEPTS → / LEVELS OF AGREEMENT ↓	ECONOMICS	PRICE	CAPITAL	MARGINAL RETURNS
HIGH	1. Use of Resources. 2. Production of Goods/ Services.	1. Amount of Money paid for Goods/Services.	1. Something Used To Produce Goods. 2. Machinery. 3. Goods That Produce Other Goods.	
MIDDLE	1. Business. 2. Work in Environment. 3. Make a Living 4. Unlimited Wants. 5. Human Behaviour.	1. Value of Good/Service. 2. Production Cost Plus Profit. 3. Cost of Production. 4. Consumer Point of Buying Good/Service. 5. Value of Production. 6. Opportunity Cost.	1. Money. 2. Money from Bank to Start Business. 3. Money to Buy Resources. 4. Buildings. 5. Man-made Goods Used in Factories. 6. Longterm Fixed Asset. 7. Assets. 8. Investment.	1. Making a Profit. 2. Breaking Even. 3. Extra Production. 4. Increase in Production. 5. Increase in Factorof Production. 6. Difference Between Two Stages of Production. 7. Income from Investment.
LOW	1. Politics. 2. Unlimited Resources. 3. Reactions to Changes.	1. Interest of Labour.	1. Bonds. 2. Money Value of Production Factors. 3. Things Already Produced.	1. Decrease in Factor of Production. 2. Decrease in Production. 3. Fixed Factor of Production.

Figure 5.1 — Summary of Themes with Similar Levels of Agreement Between 6th and 7th Formers on the 4 Economics Concepts

Phase 1 of the study. Figure 5.1 summarises the overall patterns of agreement for the two student groups.

For the concept Economics, two themes received high levels of agreement, namely, Use of Resources and Production of Goods and Services. In the case of Price, the theme Amount of Money Paid for Goods and Services was the only one to score a high level of agreement. Three themes for Capital obtained high agreement levels. These were Something Used to Produce Goods, Machinery and Goods that Produce Other Goods. There was no theme of Marginal Returns which the students indicated a high level of agreement.

The themes that received low levels of agreement between the students were: in Economics - Politics, Unlimited Resources and Reactions to Changes; in Price - Interest of Labour; in Capital - Bonds, Money Value of Production Factors and Things Already Produced; and in Marginal Returns - Decrease in Factor of Production, Decrease in Production and Fixed Factor of Production. Most of the themes in each concept had middle levels of agreement.

The two student groups revealed no significant reversal pattern such as the Sixth Formers indicating a high (or low) agreement level for a theme, and the Seventh Formers showing a low (or high) agreement level respectively for the same theme. The only contrasts were a few cases where either the Sixth Formers or Seventh Formers indicated a low or high agreement level for a theme. For example, only the Sixth

Formers showed a high level of agreement for the Capital theme Man-made Products Used to Make Products, and the Price theme Cost of Good/Service. Again, only the Seventh Formers indicated high levels of agreement for the Economics themes Scarce Resources and Choice, and low agreement levels for the Economics theme Money, and the Marginal Returns themes Limit to Production and Total Production.

Range of Themes: In Section B of each questionnaire, students were asked to indicate their meanings for each of the four concepts by, (i) using the given themes in Section A, or (ii) stating meanings not given in Section A or, (iii) combining given themes in Section A with additional ideas not given in Section A. The spread of the students' meanings for each of the four concepts was thus reflected by themes from both Sections A and B of each questionnaire, and this tended to be wide and fairly similar for both groups. Thus, out of a total of 23 themes that emerged for the concept Economics, Sixth Formers revealed a range of 22 themes (1-22), and Seventh Formers a range of 21 themes (1-19, 21 and 23). For the total 18 themes for Price, the range for the Sixth Formers was 16 themes (1-16) and 17 themes (1-14, 16-18) for Seventh Formers. A range of 21 themes (1-19, 21 and 22) emerged for the Sixth Formers regarding the term Capital out of a total of 23 themes, and there were 19 themes (1-16, 19, 20 and 23) for the Seventh Formers. Out of a total of 19 themes for the concept Marginal Returns, the Sixth Formers revealed a range of 18 themes (1-15, 17-19) with 16 themes (1-14, 16 and 18)

emerging for the Seventh Formers.

Nature of Meaning Patterns: Apart from the wide spread of themes reflecting student meanings for each concept, the two groups also produced wide patterns of meanings for each concept. Thus, Sixth Formers (n = 426) produced a total of 228 meanings, or meaning combinations, for the concept Economics, 105 for Price, 240 for Capital and 142 for Marginal Returns. For their part, the Seventh Formers (n=178) revealed a total of 120 meanings or meaning combinations for the concept Economics, 59 for Price, 104 for Capital and 77 for Marginal Returns.

The total meanings, however, were made up of both shared and unique meanings where a shared meaning referred to two or more students expressing the same thematic combination. In all the cases, the unique meanings represented a majority of the total meanings for each concept. Thus, out of the Sixth Formers' 228 total meanings for the concept Economics, 72.8 per cent (n=165) of the meanings were unique. Out of a total of 105 for Price, 53.3 per cent (n = 56) were unique. Again, from a total of 240 for Capital, 75.4 per cent (n = 181) were unique. In the case of Marginal Returns 54.9 per cent (n = 78) of the meanings were unique.

All the unique meanings of the Seventh Formers for each concept also dominated the similar ones. Thus, out of a total of 120 meanings for the concept Economics almost all (n = 96) were unique. Out of 59 meaning patterns for Price,

over half (n = 32) were unique with almost all of the meaning patterns for Capital (n = 84) being unique out of a total of 117. Again, about two-thirds of those of Marginal Returns (n = 48) were unique from a total of 77 meaning patterns.

There was no particular meaning pattern for any of the concepts that was mutually expressed by a majority in either group. For the concept Economics, the most commonly expressed meaning pattern between the two student groups did not exceed seven per cent for any of the group. The two most common meaning patterns for both groups were the combinations, (i) 7 and 10, namely, Scarce Resources and Choice, and (ii) 4,7 and 10, namely, Use of Resources, Scarce Resources and Choice.

For Price, the most common similar meanings did not go beyond nine per cent for any of the group, with the two most commonly shared meanings being the combinations, (i) 1 and 3, namely, Amount of Money Paid for Goods/Services and Cost of a Good/Service, and (ii) 1 and 4, that is, Amount of Money Paid for Goods/Services and Production Cost Plus Profit.

In the case of Capital, the most popular meaning between the two student groups was reflected by the theme, 7, namely, Goods That Produce Other Goods, though this was shared by less than six per cent in each group.

For Marginal Returns, no meaning went beyond a shared rate of six per cent in any group. The most commonly

expressed meaning between the two groups was reflected by the theme Extra Production.

On average, three to four students expressed similar meanings. This, therefore, gave an overall picture of student conceptions tending to be very unique.

Frequency of Themes: The frequency with which particular themes were included in the personal meanings for each concept tended to be very similar for the two student groups. A majority in both groups, for example, included the theme Use of Resources in their meanings of the concept Economics. Concerning Price, the theme that a majority of both student groups used as part of their meaning was Amount of Money Paid For Goods and Services. For Capital, it was the theme Goods That Produce Other Goods. In the case of Marginal Returns, there was no theme which saw a majority in each group use it as part of their meanings. However, about a third in each group included in their meanings of Marginal Returns the themes Making a Profit and Extra Production.

The situations where there were significant differences concerned the concept of Economics. While three-quarters of the Seventh Formers included the theme Scarce Resources in their meanings, less than half of the Sixth Formers did so. Also, while over half of the Seventh Formers used the theme Choice as part of their meanings only a third of the Sixth Formers did so. This discrepancy, perhaps, could be due to the Sixth Formers not regarding Scarce Resources and Choice as being significant in the meaning of Economics. It is of

interest to note, here, that it was only the Seventh Formers who showed a high level of agreement for the themes Scarce Resources and Choice. This, perhaps, could reflect the Seventh Formers having a more in-depth meaning of Economics in the sense of having some idea about the relationships of Scarce Resources and Choice with the concept Economics.

Relationships of Meanings with Economists': Going by the conceptions of Economists for three of the four concepts, that is, excluding Economics, a clear majority of each group failed to demonstrate the Economists' meanings for the concepts. For instance, about four-fifths of the students did not show the Economists' meaning of Price, while three-quarters failed to do so for Marginal Returns. In the case of Capital, over half of both student groups failed to portray the Economists' meanings. The lack of a universal agreement among Economists as to the meaning of Economics made it difficult to determine the relationships between their meanings and those of the students. However, this does not necessarily mean that all the students' meanings of Economics are acceptable. Of interest, however, is that some of the students did not accept the tendency of Economists to exclude the theme of Unlimited Resources from the meaning of Economics and the theme Money from the meaning of Capital. Situations like this could engender conceptual conflicts for the students as they endeavour to seek reasons for the exclusion of the themes.

The meanings students tended to have for the Economics concepts were of two sorts: (i) incomplete meanings such as

Price conceived of mainly as the Amount of Money Paid For Goods and Services or Capital seen mainly as Machines and Factories and Money; and (ii) everyday meanings such as Marginal Returns seen as Making a Profit or Capital seen as Money to Start Business. The reasons why students have such incomplete ideas and everyday meanings for the concepts could be that the meanings of the concepts have not been adequately explained to them, or that their teachers themselves do not hold the Economists' conceptions. The latter point is important in the sense that if teachers do not possess clear meanings of the concepts they teach, their students may possibly fail to acquire the proper conceptions of the concepts.

A related case in point concerns situations where teachers assume a concept is difficult for the students to understand and thus introduce other ideas possibly to facilitate concept learning. Thus, some teachers alluded to introducing the idea of Extra Production in teaching the concept of Marginal Returns. As mentioned in the last chapter, the problem is: To what extent does this approach help students' understanding of a concept; or could it not have the effect of predisposing students to generate inaccurate or incomplete ideas about concepts? However, it should be noted that these are but some of the problems teachers face in the teaching-learning complex. Despite the few conceptual differences between the two groups, the general picture is a high degree of similarity between their conceptions for the four Economics terms, even though their

conceptions failed generally to match those of Economists'.

The Sixth and Seventh Form Teachers' Conceptions:

The conceptions of the Sixth and Seventh Form Teachers on the four Economics terms tended to be generally similar in terms of:

1. the levels of agreement both groups had for the themes related to each Economics concept in Part A of the survey questionnaire;

2. the range of themes reflecting their personal meanings for each term;

3. the nature of the patterns of meanings, both unique and shared, reflecting each concept;

4. the frequency with which themes were included in personal meanings of each concept; and

5. the relationships between their meanings for each concept and those of Economists.

Levels of Agreement for Themes: The levels of agreement the two teacher groups had for the themes that emerged in Phase 1 of the study tended to be similar. Figure 5.2 summarises the overall patterns of agreement between the teachers.

CONCEPTS → / LEVELS OF AGREEMENT ↓	ECONOMICS	PRICE	CAPITAL	MARGINAL RETURNS
HIGH	1. Use of Resources. 2. Production of Goods/ Services. 3. Scarce Resources. 4. Choice	1. Amount of Money Paid for Goods/Services.	1. Something Used to Produce Goods. 2. Machinery. 3. Goods That Produce Other Goods. 4. Machines and Factories. 5. Man-made Products Used to Make Products.	1. Extra Production.
MIDDLE	1. Money. 2. Work in Environment. 3. Make a Living. 4. Human Behaviour.	1. Value of Good/ Service. 2. Cost of Good/ Service. 3. Production Cost Plus Profit. 4. Cost of Production. 5. Consumer Point. 6. Opportunity Cost.	1. Longterm Fixed Asset. 2. Assets. 3. Investment.	1. Difference Between Two Stages of Production.
	1. Politics. 2. Unlimited Resources.	1. Interest of Labour.	1. Money. 2. Bonds. 3. Money Value of Production Factors. 4. Things Already Produced.	1. Making a Profit. 2. Breaking Even. 3. Limit to Production. 4. Increase in Factor of Production. 5. Decrease in Factor of Production. 6. Income from Investment. 7. Decrease in Production. 8. Total Production. 9. Fixed Factor of Production.

Figure 5.2 — Summary of Themes With Similar Levels of Agreement Between 6th and 7th Form Teachers on the 4 Economics Concepts.

The themes that obtained high agreement levels were Use of Resources, Production of Goods/Services, Scarce Resources and Choice for the concept Economics, Amount of Money Paid For Goods/Services for Price, Something Used to Produce Goods, Machinery, Goods That Produce Other Goods, Machines and Factories and Man-Made Products Used to Make Products for Capital and the theme Extra Production for Marginal Returns. The themes that received low levels of agreement included Politics and Unlimited Resources for the concept Economics, Interest of Labour for Price, Money, Bonds, Money Value of Production Factors and Things Already Produced for Capital. The concept Marginal Returns had most of its themes receiving low agreement levels from the two teacher groups, and these were the themes Making a Profit, Breaking Even, Limit to Production, Increase in Factor of Production, Income from Investment, Decrease in Production, Total Production and Fixed Factor of Production.

There was no reversal pattern of agreement between the teachers groups. However, for the concept Economics the Sixth Form Teachers indicated a high level of agreement for the theme Unlimited Wants while the Seventh Form Teachers showed a low level of agreement for the themes Business and Reactions to Changes. Again, for the concept Capital the Sixth Form Teachers had a high agreement level for the theme Man-made Goods Used in Factories with the Seventh Form Teachers indicating a low agreement level for the themes Money from Bank to Start Business and Money to Buy Resources. Furthermore, only the Sixth Form Teachers

indicated a low level of agreement for the Price theme Value of Production while only the Seventh Form Teachers had a high agreement level for the Marginal Returns theme Increase in Production.

Range of Themes: Though Section B of the questionnaires gave teachers the opportunity to provide additional ideas on each concept, their meanings for each concept tended to be reflected by a restricted range of themes. Thus, out of a total of 23 themes for Economics, the range of themes reflecting the meanings Sixth Form Teachers had for the concept Economics was just 9 (themes 1,4,6,7,10,11,13,14 and 16) and 13 for the Seventh Form Teachers (themes 2,4-7,9-11,13-16 and 21). For the concept Price out of a total of 18 themes, the meanings of the Sixth Form Teachers came within a range of 7 themes, namely, themes 1-5, 7 and 9, and a range of 10 for the Seventh Form Teachers, namely, themes 1-10. Again, out of a total 23 themes for the concept of Capital, the Sixth Form Teachers revealed in their meanings only 12 themes (1,3-11, 14 and 16) and the Seventh Form Teachers just 11 themes (4,6-11,14,16 and 18). Then, out of a total 19 themes for Marginal Returns, the Sixth Form Teachers showed in their meanings a range of 9 themes, namely, themes 1-6,8,13 and 14 and a spread of 6 for the Seventh Form Teachers, namely, themes 4-6,8,13 and 14. The restricted range teachers tended to have suggests that they did not consider many of the themes as describing Economists' viewpoints of the concepts.

Nature of Meaning Patterns: The restricted nature of the spread of themes was also reflected in the pattern of meanings the teachers had for each concept. Thus, the total meanings the Sixth Form Teachers had for the concept Economics was 10, also 10 for Price and Capital and 6 for Marginal Returns. For the Seventh Form Teachers it was 18 for Economics, 16 for Price, 15 for Capital and 8 for Marginal Returns. Very few of the total meanings generally were shared. For Economics, only 2 of the total meaning patterns for each group were shared. For Price and Capital, 2 and 3 of the total meanings were shared respectively by Sixth and Seventh Form Teachers. In the case of Marginal Returns half of the total meaning patterns for each group were shared. With the exception of Marginal Returns a majority of the teachers in each group tended to have unique meanings for the concepts.

There was no meaning pattern in any concept which was shared by a majority of the teachers in each group. However, the commonly shared meanings between the two teacher groups included:

1. for Economics, the meaning pattern of 4,7 and 10, reflecting the themes Use of Resources, Scarce Resources and Choice;

2. for Price, the meaning reflected by the theme Amount of Money Paid for Goods/Services;

3. for Capital, the meaning shown by the theme Man-made Products Used to Make Products; and

4. for Marginal Returns, (i) Theme 4 reflecting the theme Extra Production, and (ii) the meaning pattern of 4 and 8 reflecting themes Extra Production and the Difference Between Two Stages of Production.

Frequency of Themes: Though the meanings teachers had for the concepts tended to reflect personal views, the frequencies with which themes in general were included in personal meanings for each term tended to be similar. However, there were only a few themes which a majority in each group incorporated in their meanings. For Economics, these were the themes Use of Resources, Scarce Resources and Choice; for Price only the theme Amount of Money Paid for Goods/Services; and for Capital only the theme Man-made Products Used To Make Products. For Marginal Returns, only a majority of the Sixth Form Teachers included in their meanings the theme Extra Production. However, while about half of the Seventh Form Teachers indicated as part of their meaning for Marginal Returns the theme Increase in Production Due To a Unit Increase in a Factor of Production with Others Fixed, only less than one-tenth of the Sixth Form Teachers did so.

Relationship of Meanings with Economists': Overall, with the exception of Capital and the special case for the concept Economics, most teachers failed to demonstrate Economists' viewpoints of the concepts Price and Marginal Returns. The conceptions teachers tended to express were incomplete views. Thus, for the concept of Price, teachers

tended to indicate Amount of Money Paid for Goods/Services instead of Economists' view of Opportunity Cost with money being just a unit of measure for Price. Again, for Marginal Returns teachers tended to reflect a meaning of Extra Production instead of the Economists' view of a Difference Between Two Stages of Production with the extra production being a differential of two production stages. In the case of Capital, a good many teachers (over two-thirds) demonstrated the Economists' viewpoint. However, due to the lack of universality among Economists as to the meaning of the concept Economics, it was difficult to determine a relationship between them and the teachers. This, by no means, suggests that all the teachers possessed acceptable conceptions of the concept Economics. It should be noted that mention has been made earlier about the suggestion by some teachers of the difficulty of teaching the concept Marginal Returns. That only a few of the teachers demonstrated the Economists' viewpoint of Marginal Returns suggests that the difficulty could, in part, be with the teachers' difficulty in understanding fully the Economists' meaning and translating it effectively to students.

Comparison Between Student and Teacher Conceptions

Generally, the conceptions of the students for the four Economics concepts tended to be different from that of their teachers. The conceptions of the students for the four concepts were characterised by wide ranges of themes as against the restricted thematic spreads of the conceptions of their teachers. Moreover, students tended to express

unique meaning patterns, though with pockets of students indicating similar meaning patterns (See Tables 4.2, 4.6, 4.10, 4.14 and Appendices 2A, 2B, 2C and 2D). On the other hand, more teachers tended to share similar meaning patterns (See Tables 4.4, 4.8, 4.12 and 4.16).

Perhaps the unique meaning patterns of the students could be a reflection of the wide range of themes they had for the concepts. However, it should be made clear that this in no way suggests a one-to-one relationship between the range of themes and the nature of meaning patterns. However, what was prominent about the unique conceptions of the students was that they were made up of mostly incomplete and everyday ideas. For example, some students tended to conceive of Capital as Machinery or Buildings instead of Goods That Produce Other Goods. The point is, Machinery and Buildings are examples of Capital, and thus are incomplete ideas of Capital, or that, they do not portray the real meaning of Capital. An especially interesting case was where most students expressed the incomplete idea of Price as Amount of Money Paid for Goods and Services instead of the real meaning of Price seen in terms of Opportunity Cost or what is given up. Apart from incomplete ideas, students also tended to have everyday notions about the meanings of the concepts. Thus, students' meaning for Marginal Returns tended to be seen as Making a Profit, possibly influenced by the everyday meaning of "Return" as profits. In fact, the meaning that students generally tended to have for Price as the Amount of Money Paid for Goods and Services, is not only

an incomplete idea of Price, but also an everyday meaning as well. Not surprisingly, therefore, a clear majority of the students failed to demonstrate the Economists' meanings for the concepts.

For their part, many of the teachers also tended to reveal incomplete ideas about the concepts. For instance, many teachers looked at Marginal Returns simply in terms of Extra Production instead of the Economists' viewpoint of the Difference Between Two Stages of Production. Again, most of them conceived of Price in terms of the Amount of Money Paid for Goods and Services instead of Opportunity Cost. With the exception of Capital, and the possible exclusion of the concept of Economics, most teachers failed to demonstrate the Economists' meanings for Price and Marginal Returns.

The fact that teachers did not demonstrate the Economists' meanings for Price and Marginal Returns could, perhaps, be indicative of why the students' failed to acquire the real meanings of Price and Marginal Returns. Notice should be particularly taken of the fact that many students tended to demonstrate their teachers' meanings of Price and Marginal Returns as the Amount of Money Paid for Goods and Services and Extra Production respectively. But a pattern like this is missing in the case of Capital where a majority of teachers shared the Economists' meaning but not the students. The students, however, tended to see Capital differently from their teachers and Economists. Why did this state of affairs exist? Did the teachers not project enough their meaning of Capital in their teaching? What is

also disturbing is the everyday conceptions that students attributed to the concepts. Did their teachers inadvertently make use of everyday ideas during teaching? The latter situation is possible in the sense that a teacher may express conceptions in a survey format similar to that of Economists, but in teaching may portray everyday meanings in his/her bid to make them 'digestible' to students. Regarding this, it should be noted that mention has earlier been made of the desire of some teachers to introduce the concept of "extra" in teaching Marginal Returns. What is not certain is whether the introduction of "extra" by some teachers in the teaching of Marginal Returns will help students to generate conceptions of Marginal Returns comparable to that of Economists'.

The above problem, however, should be seen in the context of the teaching-learning complex. Teachers do not have the means, for example, to control all the conditions in a teaching-learning situation such as the previous knowledge of a student and how this previous knowledge interacts with new material in the classroom. Moreover, teachers have the problem of translating the conceptions of experts such as scientists and economists to the level of students. It is possible that in the course of teachers translating ideas of experts students may generate totally different concepts. However, this could be limited to some extent if teachers had a good grasp of the conceptions of the experts, and translated them in such a way that the meanings were largely retained.

Despite the differences in the conceptions between the students and teachers, there were some similarities - especially concerning the patterns of agreement levels both had for some themes (See Figures 5.1 and 5.2). For example, both students and teachers expressed high agreement levels for the Economics themes Use of Resources and Production of Goods and Services. Again, both gave low levels of agreement for the Economics themes Politics and Unlimited Resources. It should be noted that the agreement to themes does not necessarily describe one's conceptions about a concept. However, the similarities of the agreement levels suggest that students, somehow, have retained some ideas of what they have been taught by their teachers, even though their meanings tended to be different from their teachers. Despite the similarity of the student-teacher agreement levels for themes, the general picture is that of a difference of conceptions between the students and teachers on the Economics concepts. Also, there is a significant mismatch between the conceptions of the students and Economists on the four concepts, leading to the suggestion, perhaps, that students generally may be acquiring Economics conceptions in the classroom not shared by Economists.

EDUCATIONAL AND RESEARCH IMPLICATIONS

Mention was made in Chapter One of the hope that the study might provide some contributions to our understanding of the teaching and learning of Economics in secondary schools, and to teaching and learning in general. This section explores the possible implications that the study

might have for both education and educational research. The educational implications, however, should be considered against the scope and limitations of the study, and therefore should not be regarded as general statements.

Educational Implications: That most Sixth and Seventh Form students in the present study failed to demonstrate conceptions held by Economists for the concepts used in the research suggests the strong possibility that many similar students across the country might also have the same kind of problem. This seems to confirm the fear of the teachers the investigator talked to in Phase 1 of the study that most of the students did not understand the subject matter of Economics, despite the efforts of teachers. However, the finding of the study indicating that many teachers do not hold comparable conceptions of Economics concepts with Economists suggests that, perhaps, many teachers too are not as accurate in their conceptual grasp of Economics as they should be. Moreover, they might be unaware of it. Certainly, some of the meanings expressed by the students could be direct reflections of ideas that they might have picked up from the classroom. The point is that the mismatch of the students' conceptions of Economics in relation to Economists should not be treated wholly as an isolated issue. If we accept the premiss that the inaccurate Economics ideas of the students have some relationships with the incomplete Economics ideas portrayed by their teachers in the study, the implication is that in the teaching of Economics, and teaching in general, adequate

knowledge of subject matter is absolutely essential. This means, therefore, that in teaching teachers should generally check the state of their subject matter knowledge.

The everyday notions students tended to have on Economics concepts needs a careful examination. In fact, in Phase 1 of the study, most of the students interviewed had difficulties in providing a technical description of the concepts. The impression obtained seems to point to a language of instruction that leans towards everyday language, perhaps, out of the desire of teachers to make the concepts more understandable to students. But there seems to be the danger that if too much use is made of everyday language as a language of instruction, students may inadvertently generate everyday and inaccurate Economics concepts. In the study, many students looked at Marginal Returns in terms of Making a Profit. Did their teachers make allusions to Making a Profit in the course of explaining Marginal Returns? This situation is of special interest, in the sense that teachers have the tendency to use everyday examples to illustrate concepts. The problem is whether the popular or common illustrations are appropriate enough to bring home the nature of a concept. Certainly not all illustrations used in teaching are appropriate. Perhaps, the implication here is that not only must teachers take stock of the knowledge of the material to be taught, but they must also examine carefully their illustrations used in teaching and the extent that everyday language as an instructional device contributes towards

clarification of concepts for learners.

As the present study shows, many teachers seem to have different conceptions about the same concepts. This, perhaps, could be one of the reasons for the plurality of conceptions revealed by the students. The implication for Economics teaching and learning is the suggestion that teaching and learning could be more effective if curriculum developers and teachers would come to a consensus about definitions for key concepts. Many teachers have the impression that Economics concepts can have several meanings, as suggested by the teachers interviewed in Phase 1 of the study. The danger of this assumption is that it could lead to an uncoordinated state of affairs in Economics teaching. This possibly could be the reason to the fact that there was no teacher meaning pattern in any of the concepts which was shared by a majority of the teachers. In view of this, a curriculum guide on Economics, developed by teachers and curriculum developers together, with clear-cut descriptions of concepts, would be a useful aid to teaching and learning and also as a supplement to textbooks. The point is, it is not enough for classroom teachers to translate individually a subject matter like Economics for classroom teaching. This is because not all teachers can effectively introduce concepts to students to help the learners generate acceptable conceptions.

One aspect of teaching is that teachers tend not to be aware of the ideas students generate in lessons. For Economics teachers and curriculum developers, it is hoped

that the ideas students revealed in this study, will sensitize them to the nature of conceptions that Sixth and Seventh Form Economics students are likely to develop. Of particular interest are the conceptual conflicts students experience. For example, the study clearly showed that some students did not understand the exclusion of Unlimited Resources and Politics from the definition of Economics, and Money from the definition of Capital. In teaching, teachers ought to clarify such situations to their students. But more importantly, these situations should be explored in-depth as they could point to shortcomings in the established conceptions of experts. An in-depth exploration here includes the teacher confronting his/her established views on Economics concepts in the light of intelligent student suggestions.

In the above paragraphs, we have considered certain implications of the study regarding Economics teaching and learning in general. A point highlighted was the possible relationship between students' misconceptions of Economics concepts and teachers' inadequate grasp of the subject matter, of which the teachers may not be aware - at least in the classroom. In view of this, the suggestion was made as to the need for a curriculum guide to accommodate teaching shortcomings such as teachers' inadequate grasp of subject matter and the different conceptions teachers have of concepts. The curriculum guide would also contain possible ideas that students may have about concepts so as to sensitize teachers. Contributing to the effectiveness of

such a curriculum guide, would, of course, be regular in-service courses for Economics teachers. In-service courses should not only concentrate on methodology but on effective ways of helping teachers become aware of the kind of ideas that students are developing, and of the ideas they bring to Economics lessons. In this regard, training in observation and informal interview techniques would be crucial.

Future Research Implications: This study explored the nature of the Economic ideas that Sixth and Seventh Form Economics Students and their teachers had about the four Economics concepts, namely, Economics, Price, Capital and Marginal Returns. The findings, however, cannot be used to generalise about the state of Economics teaching and learning. For this to be done, there is a need for further research into other Economics concepts. Since we need to know especially the ideas that students carry in their heads after lessons, there is the need to develop effective research models which will be able to highlight students' conceptions from their perspectives. The present study made use of both qualitative and quantitative approaches in this regard, though this is by no means the only appropriate method. However, it should be pointed out that no research can effectively explore "beyond the students' ears and eyes" if it disregards the qualitative approach.

One area related to this study, and which needs serious research, is the exploration of the state of the knowledge that teachers possess on Economics subject matter and the

link with students' learning. Possibly related to this is the nature of linguistic approaches and illustrations that teachers use in teaching Economics, and their possible links with student learning. There seems to be a suggestion from the present study that the Economics misconceptions that students possess could stem from the nature of illustrations and language that are used as the media of instruction.

The recommendation for future research would be incomplete without the call for action research in Economics teaching and learning. Action research, for instance, will act as a kind of validation for the issues raised under the implications of this study for education. Some of the action research of the Learning in Science Project (e.g., Boe, Cox and Bell, 1981) highlighted that student learning is improved if teachers take stock of their knowledge of subject matter. In relation to action research is the suggestion that a study be initiated to develop a teacher's curriculum guide on Economics. A curriculum guide is important if we consider the fact that teachers of Economics in Secondary Schools come from various tertiary institutions which tend to have different approaches to examining Economics concepts. A curriculum guide, supplemented by regular in-service courses, may go a long way towards reducing conceptual ambiguities on the part of teachers. There should be further research to enhance the teaching and learning of Economics in the Secondary School.

CONCLUDING REMARKS

Empirical findings from recent research in science education suggests that many children are developing concepts of science not regarded as scientific by the scientific community (Osborne, 1981a). The recent research points increasingly to the suggestion that one of the factors playing a significant part in the development of scientific misconceptions is that science teachers underestimate, and therefore, do not take into account, the influence of children's prior knowledge, memories and experiences. This had led to calls for science teachers to take greater cognizance of children's past knowledge and experiences and relate these to new material. The idea is that such a course of action in teaching will help pupils "to generate appropriate meanings from incoming information, to link these meanings to other ideas in memory, and to evaluate both newly constructed ideas and the way old ideas are related in memory" (Osborne and Wittrock, 1983).

In fact, the view of child-centred education in teaching where new material should be related to children's prior and immediate knowledge and experiences has long been recognised by such researchers as Piaget (1954, 1960, 1961, 1966) and Ausubel (1968). Recent research in science education suggests that this has been receiving only lip-service - hence the renewed calls by recent researchers.

The finding of the present research which shows that both students and teachers possess incomplete ideas and

misconceptions in Economics, suggests that the recent research in Economics education has not adequately examined the factors leading to students' misconceptions in that field. The suggestion seems to be that students' Economics misconceptions are, perhaps, linked to teachers not taking into account students' past knowledge and experience. Other factors which can possibly influence students' generation of everyday ideas in Economics seem to have been overlooked or ignored. Some of these factors include the possibilities that many teachers do not possess adequate knowledge in their subjects, and use a language of instruction which creates a favourable atmosphere towards the development of misconceptions by learners. For example, if a teacher's concept of Marginal Product is inaccurate, no amount of child-centred teaching will help students to generate the appropriate meaning for Marginal Product.

The position of the present study is, therefore, that if "teaching involves helping pupils to generate appropriate meanings" (Osborne and Wittrock, 1983) for concepts, closer attention, in addition to teachers taking cognizance of children's past knowledge and other pedagogical factors, should be given to (i) the teachers' acquisition of appropriate knowledge in their subjects comparable to that of experts and (ii) the linguistic medium that teachers use to introduce the concepts to their students. Thus, in Economics teaching and learning, and in teaching and learning generally, students may be helped to develop appropriate meanings for concepts if teachers take

cognizance of the state of their knowledge in Economics, or other subjects, and use a language that portrays vividly the meanings of concepts in Economics. This is a real challenge for teachers as it asks them to be constant learners and researchers in the classroom in the sense of evaluating their knowledge in the subject matter and the language of teaching against the feedback of students' learning. The point is that teachers should see what students learn in the classroom as a reflection of the conceptions they introduce to learners in the course of teaching.

APPENDIX ONE

TRANSCRIPTS OF INTERVIEWS

A. THE MEANING OF ECONOMICS

Sixth Formers

601

Lay: It's a relationship between man and, it's sort of, much the same way as history and geography. It's how he works in his environment and how he sets himself up in business, how's he organised in govt., how he runs his affairs individually in businesses, in the whole country. That's all I figure Economics is, how man runs his life, earns his living, but the way he lives, and how that can affect others and so on, sort of chain reaction.

Technical: Ah, much the same as I said before, as how society interacts and probably also some of the reasons as to how they use the resources available to them.

602

Lay: Basically it's the way money is; what they do with it in business, what government does with it and profit and loss. Overseas, how countries sort of export and import. Just basically the money system.

Technical: Money flow within a country. Sources of money, usage, spending of money.

603

Lay: I'd say that it's learning the theories of banking; how money is distributed, how they decide what money to use. Then of course the loan they give out, retail policies you know.

Technical: The theory of how a country runs and the practices people use in running it. It's difficult for me to define.

604

Lay: It's a social science. How people use the resources that's available to them and organise themselves. The resources are limited so they've got to choose how to use them to produce things.

Technical: It's the production of goods and services using scarce of limited resources.

605

Lay: I think I'll start at first by saying maybe it has to do with resources, and from there branch out to how people use them, what they do with them, where they put them and anything which happens from there.

Technical: The allocation of resources, government intervention and how people make their living.

606

Lay: It's a study of how people react to different changes, let's say money or inflation, and how it affects them personally, say where they work or something. You look at different kinds of things like unemployment and how much one product is wanted and things like that. And you look at inflation and banks and how you cope with the tax situation. You get some idea of what is involved in running a business.

Technical: Economics is the study of human behaviour and over time how the economy affects the individual. Economics is a social science so we study the reaction of people.

607

Lay: I'll explain Economics as the production of wants or goods or services, or what you need and with scarce resources. So it's really trying to find the balance between what you can have with the resources you've got and what you just can't.

Technical: I'll define Economics as the study of society and choice.

Seventh Formers

007

Lay: I'll explain Economics to be how people use resources, both limited and unlimited, to produce goods and services to meet their unlimited wants.

Technical: The production of goods and services using available resources to meet our unlimited wants.

701

Lay: It's the study of the use of scarce resources to produce what you need.

Technical: Economics is about efficient ways to produce what you need.

706

Lay: Sort of the study about money being broken down, and how it is in the system and things like that.

Technical: It's the study of money systems and prices. How the whole world system is going to revolve round different policies. And how you go into the critical system and the large investment in government, money supply, international trade and all that. The price system, demand and supply. It's about how the money system works.

707

Lay: Well, I'll probably explain the definition that we were taught this year - that Economics is really how people solve or try to solve the problem or the balance of trying to overcome unlimited wants as opposed to the limited resources which they have.

Technical: To me it's really the solution to the problem between unlimited wants and limited resources that a person has to make.

P03

Lay: It's a study of what goes on in the world-money and business transactions, and politics.

Technical: To me it is knowing about the world, what goes on in different places, mainly politics and business administration and stuff like that.

P05

Lay: The money system and what we use as exchange rate; how money is circulated in the economy, like business, and how people pay for goods and services; how money can buy goods and services and then, you know, how the government turns out the money.

Technical: Economics deals with the micro, the small, and the whole circle of money.

P08

Lay: The basic Economics is the home economics, with the way a person handles his money and what he does with it. Economics revolves round money and how it is handled among politicians, and then supply and demand; things like that.

Technical: Economics is the way that any person would use his money to the greatest ability to get satisfaction out of his money.

B. THE MEANING OF PRICE

Sixth Formers

601

Lay: Well, it's not just the money I might pay for something I may buy but also how the producer has to pay for resources. And also not just the money terms, but price is also on things you've made to give up. It's sort of like opportunity cost. There are other prices other than money.

Technical: The cost, either monetary or physically of paying for a good or service or resource.

602

Lay: Just basically the amount of money you have to pay for something. It deals with a lot more than just money. There's things like the price of the environment or the price of the workers in respect of their job, the environmental damage; sort of those other prices you have to pay to produce a good. It's not necessarily concerned with monetary price. There's a lot of other factors.

Technical: Price is the final total cost of a good when you take into account all the variable costs, fixed costs and other factors of consideration in determining the final cost.

603

Lay: How much something cost, that's all. How much you pay for some good. Also price is not only cost but sacrifice or something, that is opportunity cost.

Technical: The monetary cost of purchasing any good.

604

Lay: The amount of money you pay for a good or service. But that amount of money covers the interest of labour and the value of production.

Technical: Price is the value of labour, that is, the interest of labour and production measured in money.

605

Lay: It's about the value of production, or the factors involved in producing a good have to be taken into account.

Technical: A final amount to have after all the production costs have been taken into account.

606

Lay: It's the cost of production. It's kind of, just, basically saying, things like how much something cost. Just how much a company has to, how they see each step will cost at a certain price. And then, when the product comes out, then it'll be...all those costs will be put together plus an extra added on, you know, to make a profit which give them the price.

Technical: Price is how much a person is going to pay for something or for a product.

607

Lay: It's the cost of a good or service, or the cost you pay for getting anything.

Technical: The cost of goods and services. It determines the value of goods as opposed to each other.

Seventh Formers

007

Lay: Price actually is the cost of a good or service. But this is the point where the consumer will buy a good or service. Price may also include production costs and profit for the producer.

Technical: The cost of a good or service including production profit.

701

Lay: The actual price is the cost of the good. Equilibrium is not price. It is just when the amount the supplier is willing to supply meets the demand and the consumer is willing to purchase, and that the market naturally goes to that position.

Technical: The amount the consumer has to pay in order to get the good of the supplier. It just put some measure on the value of goods.

706

Lay: The cost of something. When you talk about price, of money, it means interest on the price of labour and goes into things that are commodities.

Technical: The cost of a good consistent with the supplier covering his cists, including labour and production costs. This is at the point which the consumer will buy that good.

707

Lay: Really price is the certain amount of money that's charged, or that has to be reached to gain a certain good or certain amount to be got. A price of labour or resources or anything like that.

Technical: Price is really the amount of money for certain transactions of goods and services.

P03

Lay: Price is the cost of producing a good and what you pay to the person that made the good, for the trouble of making it. That is what price is. It covers the cost.

Technical: Price is what somebody is going to charge you to buy something from him. The Law of Prices sort of determines what we can afford, what we can buy.

P05

Lay: Price will be the different values of what a good is worth, what you actually expect to pay for it, and how much resources, and many production hours and labour go to making the good. And that will eventually determine the price.

Technical: Price is the value of a good in relation to what consumers are prepared to pay for it.

P08

Lay: Price is the worth of a good. It's just the amount of money you have to pay for something.

Technical: Just what I said earlier. The amount of money you pay for something.

C. THE MEANING OF CAPITAL

Sixth Formers

601

Lay: Capital is something that's already been produced. It doesn't occur naturally and it's man-made. Man's made it to use in producing a service or a good for someone. And that's something that's used in turn to produce something more.

Technical: It's a man-made good able to be used in the production process again.

602

Lay: Usually the first stage of production to start a business or industry or something. Usually in the form of money, the opening capital or money which is invested in the business. It can also include physical things like machines.

Technical: It's the money sort of invested in the business and also large fixed assets.

603

Lay: It's asset that you may have, moneywise, and in any form such as building. Anything that is of value you have personally set aside. Some of the ..., er..., sometimes used for production. For instance, money, say around $50,000 to produce something. Or the buildings you might use for actual producing.

Technical: Total assets that you own, that is, a lump sum that you have invested in a business or firm.

604

Lay: Capital is nothing but investment. Without investment we can't produce goods and services.

Technical: Capital is the investment needed to produce goods and services.

605

Lay: More money orientated. It's what is used in production. Capital, to me, is money used in production. You need it first before you can go round to buy your land, and your other factors of production. And you need to pay for the employee's wages, then the test of control for your stages of production if you're going to continue the process of production.

Technical: The wage or money value of the factors of production involved in production.

606

Lay: What's involved in getting everything together for a product to be produced. You know, capital is the finance or where the finance is coming from. Who is going to finance, er, sponsor and how much is the finance going to be needed and involved in the making of a product. It's what kind of makes everything start. It's kind of a starting point for a factory.

Technical: Capital is what is needed to start a business. It's the finance that's going to be involved in starting a business and all the finance involved including land, labour and who's going to pay for it all and what's needed to keep the business running.

607

Lay: Man-made goods used in production of other man-made goods. It's a long term fixed asset, an house, machinery, cars. You talk about your capital outlay of a private person's home, you mean that house, their land, but in Economics, it's really any piece of equipment which is used to make other pieces of equipment like processing and the like.

Technical: Man-made goods used in the production of other man-made goods.

Seventh Formers

007

Lay: Capital is the machinery, that is, the machines and factories which are used to produce consumer goods. We cannot produce goods without machines.

Technical: The machines and factories used in the production of goods. Also buildings.

701

Lay: A set of production which you use to produce other goods. Examples are the machinery or factories being used to produce goods to the consumer.

Technical: It's just a man-made asset that's used to produce other goods.

706

Lay: Capital is machines, the man-made goods used in the factory. Capital is, well, you need the capital. The entrepreneur has to borrow money to buy capital for a start. And it plays that role, a sort of investment, but production has to play a great role.

Technical: Capital is the man-made machines and products used to make products.

707

Lay: Capital is money which goes for, into business, or which is necessary for business production to operate and to produce things. Like, a certain amount of capital has to be obtained from a producer's point of view to, say, buying a certain machine which will produce a certain amount of good.

Technical: Capital is really money put to use as a factor of production to increase the development of industries.

P03

Lay: Goods that produce other goods. The machines that produce other goods.

Technical: An important factor of production that produces consumer goods; and it doesn't change in shape or form usually so that it could perform. It's important to the producer. He's got to have something to produce his goods: capital - the machines and money.

P05

Lay: The big machinery that helps to produce the products in a way. For instance, in a potato farm the capital would be the big machines.

Technical: Large build-up of money that is going to start things.

P08

Lay: Capital is money or bonds, things like that; or what a person borrows from the bank to get his business started, or his returns from selling his goods or interest. Anything, just the money side of the business.

Technical: What a producer can use to hold his business and produce his good. Just to have that capital buy his resources, get his business going. And this can be repaid with the money he raises for selling his goods. If the producer can get his money, his capital, he can buy bigger buildings, better sites, faster trucks, more efficient machines and things like that.

D. THE MEANING OF MARGINAL RETURN

Sixth Formers

601

Lay: It's when you bring in factors of production, you get a return on the production on them. And the more you bring in one factor of production, say, you bring in more labour, your returns will come up. You'll get more out of it, more production but that the increase in production may get to a point where it won't get any larger.

Technical: Marginal Returns are the returns, either decreasing or increasing, that you're getting from production by bringing in more of a factor of production.

Lay: It'll be the return of your investment and business, the profit after what results between what's offered in the business and expenses in the business. Whatever sort of gains of what you get back, the returns on investment.

Technical: The return over...could be in cash or some physical value, as more of what returns back to the business after your sort of initial production.

603

Lay: It's the difference between; when you produce something, right, you might be producing with six people, say, producing lollipops. You might use six people and produce 100 lollipops. Okay. Then get seven people and you might produce 120 and on and on it goes. Then at some stage it will go down till it comes, say, with 20 people you'll only make 90 lollipos, and it starts to go down as more people come in. Eh, the Marginal Return is the difference between the production at one stage and and another, between having six people producing and seven people producing. So it's the difference between producing 100 and 120.

Technical: Marginal Return is the amount of production, that is, the difference or the amount of production between one stage of production and another.

604

Lay: This is the income from investment which is profit. Say you invest $1,000 in business and you make $100 profit or income, that's your Marginal Return.

Technical: Marginal Return is the income from investment.

605

Lay: Certain amount you get back, just that amount.

Technical: N.B. 605 indicated not remembering or knowing what Marginal Return was, although remembered having been exposed to the term in the classroom.

606

Lay: Say, you've got a bakery. Say, one person makes 20 loaves of bread. You add another person and together they make 40 as they double the returns. So as you get more people, the more bread they make. And then as you get up to a certain amount of people, then depending on how much resources you've got, how much facilities are available for you, then the returns could go down because of all the people not working, keeping up the operation because there's not been enough resources, not enough facilities. And there's just too many people so the Marginal Returns will go down. Marginal Return is what can be produced with extra resources.

Technical: The total of a product that is produced by a certain amount of people, a limited amount of people with limited resources. And the less amount of people that you have the more a company is not getting to the output that it could have. Once you get to an amount of people you could have an efficient production. If there's too many people it's not efficient because no one is getting the job done. So it's the total of all these different levels.

607

Marginal Return, I think, is you produce a good and you get paid for it and that's the return. Then you produce another good and you get paid for it more, and that's your return. And the difference between the return on the first good and the second good is the Marginal Return.

Technical: It's the difference between the production of a first good and the second one.

Seventh Formers

007

Lay: This is the difference between, say, you produce a certain amount of output using a set of factors of production. Then you change the set of the factors of production and you get another output. Marginal Return is the difference of outputs between the two sets of production.

Technical: Marginal Return is really the difference between two stages of production.

701

Lay: The extra return, extra production you get when you increase a fixed factor like labour. Something that sees extra production you get with increasing labour.

Technical: It's just the extra production a year by adding more units of a factor, a certain factor of production such as, well, keeping the other factors of production constant.

706

Lay: It's in production, in goods, got it fixed: capital, land and machines, and if you have one more man of labour to it, that is, each production you gain from that one man is Marginal Return.

Technical: It is the increase in production of adding an extra factor of production to a fixed factor of production.

707

Lay: It's really when, we take an example, say, like labour. We have a certain amount of labour, say, in a field or something. But if we add some more labour to it, we might not necessarily get, say, if we increase the labour twice we might not necessarily get twice the output or the return from that particular group. You'll probably find, in the case of diminishing returns, you only might get, say, perhaps a certain amount of work done but you won't get up to the full amount of double the work. You won't get that full expected amount of work done. Because you get up to a point, I think, where economies of scale come in and they con't work just as efficient as the group before that.

Technical: Marginal Return is really the Economist's point with the best possible, where, the point where his resources or factors of production, eh, the actual amount of them can determine whether they're bringing the revenue or output proportionally to the amount which is employed. Therefore he can determine whether he is making a profit.

P03

Lay: Marginal Return is the return you can get back just to make a profit and not making anything extra, just to cover your cost. It would be the gap between the cost of production and what you can get back from it. As a margin, as a gap, how much it cost you, and how much you're getting back as profit. And the bigger the gap is the bigger the margin.

Technical: It is the gap between profit and loss, breaking even, making a profit.

P05

Lay: Well, when you are producing a product you get to a stage where you put the goods in the market and you get money from them. Your return rises at a certain stage. At marginal stage you cannot rise any further; the income you are getting from your produce cannot get further. The income you are getting from your produce is actually subsidized because you yet have to pay for labour, pay for keeping the capital, your profit. And you get to a point you cannot go further because you got to take money to pay for these.

Technical: The Marginal Return is the limit they can't get any further. It's the limit to production.

P08

Lay; just how much a producer will have to get back from selling his goods to make profit or to break even. If he has to sell 20 items to make a profit, he has to sell 21. So if he sold 21, he would be making a profit. If he sold 19 he would be making a loss and if he just sold 20 he would be covering his cost.

Technical: The Law of Marginal Return will be, the fact is, everything has to be taken into account by the producer - land that should be fixed, rates, cost of labour, what it cost him - and then he would be able to set his price and make a profit.

APPENDIX TWO STUDENTS' UNIQUE MEANINGS

Appendix 2A

Students' Unique Meaning of Economics

Sixth Form (Total = 165)

1,2	2-4,6-8,10,11	4,8,14	8,11
1,2,3,4,6	2-4,6,7,10,12	4,8,13,14	10
1,7	3,5	4,7,9	10,11
1,7,10	3,7	4,6,7,9-11	10,12
1,2,6	3,8	4,7,9,10,14	10,16
1,2,3,4	3,5,6	4,7,10,11,14	11
1,2,3,6	3,6	4,7,11,13,14	12
1,2,4,6	3,5,10	4,7,9,10,13	1,4,6-11,13
1,2,4,10	3,8,14	4,6,7,10,11,14	4,5,6,8,13
1,2,8,13	3,4,6,11	4,6,10,13,14	1,6,10
1,3,4,6	3,4,6,13	4,6,9,10,11,13	2-6
1,3,6,10	3,4,10,16	4,7,10,13,14	2,3
1,4,6,9	3,6,7,10	4,7,11,13,16	2,3,6
1,4,5,10	3,6,10,17	4,6,7,9,11,13,14	2,3,4,7,10
1,4,5	3,4,6,16	4,17-20	2,3,3,7,10
1,4	3,4,6,9,10,11	5,8	2,4,6,7,10
1,5,6	3,4,6,8,10,11,13	5,12	2,3,4,6,7,10
1,4,17	3,6,7,10,16	5,11,12	2,7,9,11
1,6,13	4,5,7	5,8,10,12	4,7,10,12
1,7,13	4,5,10	5,13	4,8,9,11
1,10,11	4,5,13	5-7	4,10,12,15
1,10,13,14	4,5,6,8	5,7,10	4,11,13,16
1,6,9,10	4,6,8	5,7,10,13	4,6,8,11,13
1,10,13	4,6,8,13	5,8,11	4,6,7,8,11
1,4,6,17	4,6,15	6,8	4,6,7,9,13
1,3,6,7,11	4,7,17	6,11	4,6,9,11
1,3,4,6,9	4,10,13	6,12	4,6,7,10,13
1,2,7,10,14	4,8,16	6,14	4,6,10,13,16
1,3,4,6,10	4,11,13	6,7,11	4,6,10,14,16
1,3,4,10,11	4,11,16	6,11,13	4-8,10
1,4,13	4,5,10,16	6,112,13	7
1,6,9	4,6,10,12	6,12,16	7,8,16
1-6	4-8	6,13,15	7,10,12
1-13	4,6,10,11	6,14,15	7,17
1,3,8,10,13	4,6,7,13	6,7,10,11	7,16
1,2,4,7,10	4,6,7,17	6,7,10,14	7,17,19
1,4-6,12,13	4,6,14,15	6,8,13,22	7,11,13
1,3,4,5,7,10	4,6,7,14	6,10,12,13	7,8,10,21
1,3,4,6,7,11	4,6,7,14,21	6-13	7,9,12,13
1,4,6,7,10,11,14	4,7,11,12	6-8,11-16	7,10,11,13
1,4,6,7,22	4,7,9,11	6,7,10,11,13	7,8,11
2,5,8			

Seventh Form (Total = 96)

1,3,4,6,7	4,7,10,14,23
1,3,8	4,6,7,10,11,16
1-8,10-13	4,6,8,10,11
1-13	4,10,11,16
1-14	4,7,13
1,3,4	4,8
1,3,4,6,7,10	4,10,17
1,4,7	4,6,7,9-12
1,4,7	4,6-8,10,11
1,3,4,15	4,10,12
1,4,7,10	4,5
1,4,6,7,10	4,6,17,19
1,6,10,14	4,6,7,10,14
1,4,6,7,10,14	4,6,10,11,14
1-3,8	4,14
1,3,6,8	4,6,7,11
1,3,4,6	4,6,7,9,10,13
1,3,6,7	4,8,11
2,8	4,6,7,10,17
2,7,10,13	4,6,7,10,13
2,17	5,14
3,4,6,7,10,13,21	5,7,11
3,6,10	5,8
3,4,7,10	6,7,10
3,8	6,10,13
3,4	6,8,10
3,4,7,13	6,10,11
3-6	6,7,14,17
3,7,10,13,14	6,7,11,14
3,4,6,7,9,10,13	6,7,10,14
3,4,6,9,11	6,11
3,4,7,11,16	6,7
3,6	6,10
3,4,7,10,13	6,14
3,6,7	6-10
3,6,7,10	7
3,4,6,7,10,14	7,10,13
3,7,10	7,110,11,17
3,4,6,7,11	7,14,17
3,4,6,7	7,10,11,13
3,4,7	7,8,10
3,4,6,8,13	7,9,10
3,4,6	8,16
4	9,10,11
4,9,11	10,11
4,11	4,6,10,12
4,10	4,13
4,6,7,10,16	4,11,13
4,6,7,10,11,14	

Key to Themes

1. Money
2. Politics
3. Business
4. Use of Resources
5. How Man Works in Environment
6. Production of Goods and Services
7. Scarce Resources
8. How Man Makes a Living
9. Unlimited Resources
10. Choice
11. Unlimited Wants
12. How Man Reacts to Changes
13. Human Behaviour
14. Distribution of Goods and Services
15. Consumption of Goods and Services
16. Satisfaction of Wants
17. Best Utilization of All Resources
18. Utmost Production
19. Least Waste, Time and Cost
20. Optimum Social Cost
21. Opportunity Cost
22. Difficulty of Making a Living
23. Saving of Resources for Future Use

Appendix 2B

Students' Unique Meanings for Price

Sixth Form (Total = 56)

1,5,6	1-3,5	3,6	4,6,7
1,2,7	1-5	3,5,7	4,6,7,12
1-3,7	1,7,9	3,5,8,9	4,12
1,5,9	1-3,5,6,9	3,4,9	4,5,7,16
1,2,3,8,9	1,3,12	3,4,6	4,5,6-9
1,3,5,7,9	2,9	3,7,9	5,6
1,4,9	2,7,8	3,4,7	5,8
1,15	2-5	4,7,8	5,6,10
1,2,7,12	2,3,9	4,7,9	5,8,9
1,4,5	2,3,4	4,8,9	5
1,9	2,4,5,7,9	4,5,11	6,7
1-3,5,6	2,8,9	4,6	7,12
1,2,3,8	2,5	4,7,14	7,14
1,12	3,7,12	4,7,14	7,14
1,8			16

Seventh Form (Total = 32)

1-5,9	1,4,7,17	2,4,7,9	4,7,17
1,2,7	1,3,5,7	2,3,7,10,14	4,5
1,3-5	1,2,3,9	2-4	4,5,10
1,4,7,9	1,2,7,12	2,4,7	5,7
1,4,12	1,18	3-5	5
1,4,8	2,4,7	3-6	7,9
1,3,5	2,7	3,7,9	9
1,2,3,8	2,4,5	4,9	13

Key to Themes

1. Amount of Money Paid for Goods or Services.
2. Value of a Good or Service.
3. Cost of a Good or Service.
4. Production Cost plus Profit.
5. Cost of Production.
6. Interest of Labour
7. The Point Where Consumer will buy a Good or Service.
8. Value of Production.
9. Opportunity Cost of a Good or Service.
10. Exchange Value
11. Return for Risk of Production.
12. Where Supply Equals Demand, i.e., Equilibrium Point.
13. A Signal to When Copsumers should buy and Producers Produce.
14. Scarcity of Product.
15. What Seller Offers to Sell the Good at, not necessarily What is Paid.
16. Willingness of Consumers to pay.
17. Marginal Utility of Good.
18. Risk.

Appendix 2C

Students' Unique Meanings for Capital

Sixth Form (Total = 181)

1,6,7
1,10,14
1,15,16
1,7,9,11
1,3,4,7,11,16
1,3,6,7,8,15,16
1,5,16
1,3,4,7,11
1,4,19
1,11
1,6
1,5
1,2,3
1,16
1,3
1,9
1,12
1,7,16
1,6,8,10,14,15
1,3-7,10,12,15
1,14,15
1,4,6-8,10,11,15
3,6
1,4,6,8
1-4,6,8
1,4,6,10
1,4,6
1,5,7,14-16
1-3,6,7,15,16
1,4,6,7,10,16
1,3,6,15,16
1,3-11,14-16
1,7,11,16
1,3,6,16
1,4,7,14,16
1,7,15,16
1,3,7,11,16
1,4,9,11
1,6,11
1,6,9,11
1-7,9,11
1,7,11
1,3,4,6-8,11,14

1-11,14
1,8,10,14
1,3,4
1,3,7
1,4,7
1,15,22
1,4,6,8
1,4,7,16
2-16
1m,6,11
2,3,5,12
3,11,14,16
3,12,16
3,4,7-11,14
3,4,6-8,16
3,12
3,4,7,16
3,14,16
3,7,8,10
3,5,7,10
3,10

5,10
3,4,6,8,10,14,16
3,7,11,15,16
3,4,7,16
3,4,5,16
3,4,5,12,14,15,16
3,7,11
3,6,7,11
3,4,6,7,9,10,14
3,4,5,7
3,5,12
4,6,11,14,16
4,7,9,11,13,15
4,15,16
4,6,7,8,9,10,11
4,14,16
4,7,16
4,6,7,21
4,6,7,9,10,11,15
4,7,9,10,15
4,6,8

4,7,11,15
4,6,7,8
4,6-8,10
4,13
4,7,15,16
4,5,7,11,16
4,6,7,10,16
4,6,7,8,16
4,6,8,10,11,16
4,6,10,11,14-16
4,6,7,8,11
4,7,10,11
4,6,7,8,10,11
4,7,11,14
4,7,9
5,16
5,6,7,11
5,12
5,15,16
1,7,16
5,7,16

7,10,15
5,11,12
6,7,8
6,9,10,14
6,7,8,10
6,7,17
6,8,9,10,14,15
6,7,8,13,14,15
6,8
6,9,10
6,7,9,10
6,8,9,10,14,16
6,8,11,14,16
6,7,11,14,16
6,7,9,10,11
6,8,10,14-16
6-11
6,10,11
6,7,8,11
6,8,10,11
6,7,8,10,11

7,9,11,16
5,11
7,11,14
7,9,14
7,10,14
7,11,16
4,6,7,21
7,9,10
7,8,10
7,8,11,14-16
6,8,10,11,16
7,8,15,16
6,7,14-16
7,14-16
7,9,11
7,8,10,11
8,10,12,14-16
8,10,14
8,10,14,16
7,14-16
8,15

8,10,11,14
8,12,16
9,11,14,16
9,10,11
10,14
10,15,16
10,14,16
9
11,14
11,12,15
11,15
11,12,15,16
12
12,15
12,14-16
12-14
14
16

Seventh Form (Total = 84)

1,14,16
1,3,7,11
1,7
1-16
1,3,5,16
1,5,7,12,14-16
1,3,4,15,16
1,11
1,9,11
1,4,7,11,16
1,5
1,5,16
1,10,16
1,4,7
1,7,11
1,3,7,15
1,4,7,10,15
1,3,5,12,16
1,3,4,7,16
1,7,10
10,11

1,6,7,8,10
1,3,7,15,16
2,14,16
3,15
3,7,10
1,3,5
3,11,15
3,6,7,16
3,5,7,9,11,15,16
3,14
3,4
3
3,4,7
3,4,7,10
4,12,16
4,6,7,11
4,6-12
4,5,6,8
4,7,15,16
4,11
11,14

4,6,10,11,16
4,6,10
4,7,16
4,7,9,10,11
4,7,9
4,7,11,12,15
4,6-8,10,15
4,14
4,6,7,9-11,13,16
4,9,11
5,6,7,15,16
5,10,12,19
5,6,7
5,6,14,15
6,10,11
6,7,9-11,14
6,10
6-8,10
6-11
6,10,14
14,16

6,7,11
6-8,10,11
6,8,10,14,15
6
6,14
6,7,9-11
6,9,15
6,7,10
6,8,10,15,16
6,7,10,11
6,8,10
7,10,20
7,10,14
7,9
7,11,15
7,14,16
7,11,16
7,11,19
9,11
19
23

Key to Themes

1. Money
2. Bonds
3. Money Borrowed from Banks to get Business started, i.e., Finance.
4. Something used to Produce Goods.
5. Money to Buy Resources and Pay for Labour.
6. Machinery.
7. Goods that Produce Other Goods.
8. Buildings.
9. Man-made Goods used in Factories.
10. Machines and Factories.
11. Man-made Products Used to Make Products.
12. The Usage of Money Value of the Factors of Production.
13. Things already Produced.
14. Longterm Fixed Asset.
15. Assets.
16. Investment.
17. Something of Value Used to Produce Something of Value.
18. Man-made factor used as Intermediary of final Goods.
19. Value of Business.
20. Things not consumed directly by consumer.
21. Investment in New Technology.
22. Land.
23. A Resource that is both limited and necessary for Production.

Appendix 2D

Students' Unique Meanings for Marginal Returns

Sixth Form (Total = 78)

1,3,4,11,12	1,4,8	3,4,5	5,6,10,11
1,4,6,11,12	1,2,6,7	3,4	5,10
1-12	1,10	3,7,8	5,14
1,2,9,12	1,2,10	3,4,8	6,8,12
1,5,11	1,6,13	3,4,10	6,9
1,3,11	1,13	3,5,10,18	6,9,13
1,5,6,11	1,4,13	3-6,14	6,7,8,13
1,4,11	2,11	4,11	6,7,9,13
1,3,4,6	1,6,11	4-6,8	7,10,12
1,5,6	2,5,6,9	4,6,8	7,8,9
1,4-6	2,5	4-7	7,10
1,6,7,9	2,6,8	4,5,13	8,11
1,3,6,9	2,6,7	4,6,7,9,13	8,10
1,3,8,9	2,5,6,13	4,5,6,13	8,14
1,3,9	2,9,13	4,5,19	9,12
1,2,4,5	3,4,11	4,5,14	9,10,11
1,3,5	3,11	4,8,19	10
1,2,4	3,4,5,6	4,8,14	11
1,3,8	3,4,6	5,9,10,11	15
1,2,6,8	3,5,8,9		

Seventh Form (Total = 48)

1,5	1,9,11	2,7	5,12
1,4,9	1,6	2,13	4,5,13
1,3,9	1,4,13	3	5,10,13
1,3	1,8,9	3,4,7,18	5,8,9
1,4,8	1,9,14	4,5,10	6,9
1,3,9,11	1,4,6,10	4-6	6,7,8,14
1,4,5	1,4-6,11	4-6,9	6,13
1,2,4-6,9	1,2,3	4,6,9	8,9,13
1,4,6	1,4,5	4,10	8,14
1,5,8,9	1,12	4-9	11,12
1,4,6,8	2,3	5,8	16

Key to Themes

1. Making a Profit.
2. Breaking Even.
3. Limit to Production.
4. Extra Production.
5. Increase in Production.
6. Increase in the Factor of Production.
7. Decrease in the Factor of Production.
8. The Difference Between Two Stages of Production.
9. Increase from Investment.
10. Decrease ion Production.
11. Total Production.
12. The Fixed Factor of Production.
13. Increase in Production Due to a Unit Increase in a Factor of Production with Others Fixed.
14. Return on the Last Unit Produced.
15. Satisfaction Derived from Consumption.
16. Making a Better Return Than Before on an Increase in Investment.
17. Diminishing Returns on Investment.
18. The Variation of Production in Order to find the Optimum Point of Efficiency.
19. The Amount over and above the normal Production of a Good or Service.

REFERENCES

ALCHIAN, A. Economic Education in the Secondary School and "The People on Market Street". Educational Perspectives, v17 n2, 22-24, 1978.

AMMER, C. and AMMER, D.S. Dictionary of Business and Economics (Revised and Expanded Version). New York: Free Press, 1984.

AUSUBEL, D.P. Educational Psychology: A Cognitive View. New York: Holt, Rinehart and Winston, 1968.

BECKER, H.S. Outsiders. New York: Free Press, 1963.

BELL, B.F. When is an Animal not an Animal? Journal of Biological Education, v15 n3, 213-218, 1981.

BOE, R., COX, R. and BELL, B. Towards Solutions: The Work of the Biology Action-Research Group. Hamilton: L.I.S.P., University of Waikato, 1981.

BOGDAN, R.C. and BIKLEN, S.K. Qualitative Research for Education: An Introduction to Theory and Methods. Boston: Allyn and Bacon, 1982.

BORICH, G.D. Implications for Developing Teacher Competencies from Process-Product Research. Journal of Teacher Education, v30 n1, 77-86, 1979.

BROPHY, J. and EVERTSON, C. Learning From Teaching: A Developmental Perspective. Boston: Allyn and Bacon, 1976.

BROWN, R.J. Student Economics (New Revised) Part 1. Sydney: Brooks, 1970.

BROWN, M.J. Mc. and SCHNEIDER, D.O. The Economics Textbook: A Learning Tool or Source of Frustration. Peabody Journal of Education, v57 n3, 172-177, 1980.

CAMPBELL, D.T. and STANLEY, J.C. Experimental and Quasi-experimental Designs for Research. Chicago: Rand McNally, 1966.

CARAMAZZ, A., McCLOSKEY, M., and GREEN, B. Naive Beliefs in 'Sophisticated' Subjects: Misconceptions about Trajectories of Objects. Cognition, v9 n2, 117-123, 1981.

CRONBACH, L.J. and SNOW, R.E. Aptitudes and

Instructional Methods: A Handbook for Research on Interactions. New York: Irvington, 1977.

DALGARD, B.J. Using the Local Economy to Integrate Economic Concepts into Instruction. Social Studies Journal, v13, 5-7, 1984.

DRIVER, R. The Pupil as Scientist. In Physics Teaching: GIREP, U. Ganiel (Ed.) Philadelphia: Balaban International Science Services, 331-345, 1980.

DRIVER, R. and EASLEY, J. Pupils and Paradigms: A Review of Literature Related to Concept Development in Adolescent Science Students Studies. Science Education, v5, 61-84, 1978.

DUNKIN, M.J. and BIDDLE, B.J. The STudy of Teaching. New York: Holt, Rinehart and Winston, 1974.

EISNER, E.W. The Use of Qualitative Forms of Evaluation for Improving Educational Practice. Educational Evaluation and Policy Analysis, v1 n6, 11-20, 1979.

FISHER, C.W. and BERLINER, D.C. Clinical Inquiry in Research on Classroom Teaching and Learning. Journal of Teacher Education, v30 n6, 42-47, 1979.

FLANDERS, N.A. Imperatives in Teacher Education. Keynote Address at the Annual Conference of the South Pacific Association for Teacher Education. Brisbane, Australia, 1983.

FLAVELL, J.H. Cognitive Development. Englewood Cliffs: Prentice-Hall, 1977.

FREYBERG, P.S. and OSBORNE, R.J. Who Structures the Curriculum: Teacher or Learner? SET 2, Item 6. Wellington, New Zealand Council for Educational Research, 1981.

FREYBERG, P.S., OSBORNE, R.J. and TASKER, C.R. Problems and Difficulties: The Working Papers of the Exploratory Phase. Hamilton: Learning in Science Project, University of Waikato, 1979.

FURLONG, V. Anancy Goes to School: A Case Study of Pupil's Knowledge of Their Teachers. In P. Woods and M. Hammersley (Ed.), School Experience. London: Groom Helm, 1977.

GAGE, N.L. Paradigms for Research on Teaching. In Gage, N.L. (ed.), Handbook of Research on

Teaching. Chicago: Rand McNally, 1963.

GAGE, N.L. Theories of Teaching. In E.R. Hilgard (Ed.) Theories of Learning and Instruction. NSSE Yearbook No.63, Part 1. Chicago: University of Chicago Press, 1964.

GAGE, N.L. The Scientific Basis of the Art of Teaching. New York: Teachers College Press, 1978.

GILBERT, J.K., WATTS, D.M. and OSBORNE, R.J. Student Conceptions of Ideas in Mechcanics. Physics Education, v17, 62-66, 1982.

HAIGH, N. Research on Teacher Thinking. Paper presented at the Third National Conference of the New Zealand Association for Research in Education. University of Waikato, 4-6 December, 1981.

HAIGH, N. Exploring Hidden Aspects of Teaching. Paper presented to the Annual Conference of South Pacific Association of Teacher Education, Chisholm Institute of Technology, 6-9 July, 1982.

HAIGH, N.J. and KATTERNS, R.W. Effective Teaching: Problem or Goal? Journal of Teacher Education vXXXV, n5, 23-27, 1984.

HAPPS, J.C. Some Aspects of Student Understanding of Soil. S.E.R.U. Hamilton: University of Waikato, 1981.

HEATH, R.A. and NIELSON, M.A. The Research Basis for Performance- Based Teacher Education. Review of Educational Research, v44 n4, 463-483, 1974.

HELM, H. Conceptual Misunderstandings in Physics in the Teaching of Physics: Perspective 3. School of Education, University of Exeter, 1980.

HUMPHREYS, I.J. Economic Theory. Carlton: Pitman, 1975.

KATTERNS, R.W. The Relative Effectiveness of Different Forms of Microteaching Incorporating a Sensitisation Approach. Unpublished D.Phil Thesis, University of Waikato, New Zealand, 1978.

KATTERNS, R.W. Teaching Practice: The Student Teacher as Supervisor. Paper presented at the Annual Conference of South Pacific Association for Teacher Education, Melbourne, Australia, 1982.

LEBOUTET-BARRELL, L. Concepts of Mechanics among Young People. Physics Education, v2 n7, 462-66, 1976.

LECOMPTE, M.D. and GOETZ, J.P. Problems of Reliability and Validity in Ethnographic Research. Review of Educational Research, v52 n1, 31-60, 1982.

LINDAUER, J. Economics: A Modern View. Philadelphia: Saunders, 1977.

McCALL, R.B. and McGHEE, P.E. The Discrepancy Hypothesis of Attention and Affect in Infants. In Urzgiris, I. C. and Weismann, F. (Ed.) The Structure of Experience. New York: Plenum, 1977.

MADEY, D.L. Some Benefits of Integrating Qualitative and Quantitative Methods in Program Evaluation. Educational Evaluation and Policy Analysis,v4, n2, 223-236, 1982.

MADEY, D.L. and EVERETT, M. The Client Assessment Package. Durham, N.C.: NTS Research Corporation, 1978.

MEDLEY, D.M. Teacher Competence and Teacher Effectiveness: A Review of Process-Product Research. Washington D.C.: AACTE, 1977.

NUSSBAUM, J. and NOVAK, J.D. An Assessment of Children's Concepts of the Earth using Structural Interviews. Science Education, v60, 535-550, 1976.

OSBORNE, R.J. Children's Ideas about Electric Current. N.Z. Science Teacher, 29, 12-19, 1981a.

OSBORNE, R.J., FREYBERG, P. and TASKER, R. An Initial Framework. Hamilton: L.I.S.P., University of Waikato, 1979a.

OSBORNE, R.J., FREYBERG, P. and TASKER, R. Focus on Experiments. Hamilton: L.I.S.P., University of Waikato, 1979b.

OSBORNE, R.J., FREYBERG, P. and TASKER, R. Focus on Knowledge. Hamilton: L.I.S.P., University of Waikato, 1979c.

OSBORNE, R.J., FREYBERG, P. and TASKER, R. Focus on Topics. Hamilton: L.I.S.P., University of Waikato, 1979d.

OSBORNE, R.J., FREYBERG, P. and TASKER, R. Focus on the Teacher. Hamilton: L.I.S.P., University of Waikato, 1979e.

OSBORNE, R.J. and GILBERT, J.K. A Technique for Exploring Students' Views of the World. Physics Education, 15, 376-379, 1980.

OSBORNE, R.J. and WITTROCK, M.C. Learning Science: A Generative Process. Science Education, v67 n4, 489-508, 1983.

PAGE, E.B. More Objective. Debate, Should Educational Evaluation be more Objective or more Subjective? with R.E. Stake, delivered at the annual meeting of the American Educational Research Association, Toronto, 1978.

PARTLETT, M. and HAMILTON, D. Evaluation as Illumination: A New Approach to the Study of Innovatory Programs (1975). In G.V. Glass (Ed.), Evaluation Studies Review Annual, 1, 140-157, 1976.

PASSMORE, J. The Philosophy of Teaching. London: Duckworth, 1980.

PELTO, P.J. Anthropological Research, The Structure of Inquiry. New York: Harper and Row, 1970.

PIAGET, J. The Child's Conceptioon of Physical Causality. New York: Harcourt Brace Jovanovich, 1930.

PIAGET, J. The Conception of Reality in the Child. New York: Basic Books, 1954.

PIAGET, J. The Child's Conception of the World. Totowa: Littlefield, Adams, 1960.

PIAGET, J. Development and Learning. In R.E. Ripple and V.N. Rockcastle (Ed.), Piaget Rediscovered. Ithaca: Cornell University Press, 1964.

PIAGET,J. The Child's Conception of Physical Causality. Totawa: Littlewood, Adams, 1966.

ROSENFELD, G. Shut Those Thick Lips. Can't You Behave Like a Human Being. Unpublished Doctoral Dissertation, Teachers College, Columbia University, 1968.

ROSENSHINE, B. Classroom Instruction. In N.L. Gage (Ed.), The Psychology of Teaching Methods: Seventy-fifth Yearbook of the National Society for the Study of Education. Chicago: University of Chicago Press, 1976a.

ROSENSHINE, B. Recent Research on Teaching Behaviours and Student Achievement. Journal of Teacher

Education, 27, 1976b.

ROSSI, P.H. and WRIGHT, S.R. Evaluation Research: An Assessment of Theory, Practice and Politics. Evaluation Quaterly, v1 n1, 5-52, 1977.

ROWLEY, E. The Retail Price Index. Economics, v15 n3, 80-84, 1979.

RYANS, D.G. Characteristics of Teachers: Their Description, Comparison and Appraisal. Washington, D.C.: American Council on Education, 1960.

SAMUELSON, P.A. Economics: An Introductory Analysis. New York: McGraw-Hill, 1964.

SCHOLLUM, B. Chemical Change. Hamilton: L.I.S.P., University of Waikato, 1981.

SHAVELSON, R. and RUSSO, N.A. Generalizability of Measures of Teacher Effectiveness. Educational Research, v19 n3, 171-183, 1977.

SIEBER, S.D. The Integration of Fieldwork and Survey Methods. American Journal of Sociology, v28 n6, 1335-1359, 1973.

SMITH, L.M. and GEOFFREY, W. The Complexities of an Urban Classroom. New York: Holt, Rinehart and Winston, 1968.

SPRADLEY, J.P. The Ethnographic Interview. New York: Holt, Rinehart and Winston, 1979.

SPRADLEY, J.P. Participant Observation. New York: Holt, Rinehart and Winston, 1980.

SPSS-X User's Guide: New York: McGraw-Hill, 1983.

STAKE, R.E. The Case Study Method in Social Inquiry. Educational Researcher, v7 n2, 5-7, 1978.

STEAD, B. Living. Hamilton: L.I.S.P., University of Waikato, 1980.

STEAD, K.E. and OSBORNE, R.J. Friction. Hamilton: L.I.S.P., University of Waikato, 1980.

STEAD, K.E. and OSBORNE, R.J. What is Friction: Some Children's Ideas. Australian Science Teachers Journal, v27 n3, 51-57, 1981a.

STEAD, K.E. and OSBORNE, R.J. What is Gravity: Some Children's Ideas. N.Z. Science Teachers, 30, 5-12, 1981b.

STEPHENS, J. The Process of Schooling. New York: Holt, Rinehart and Winston, 1967.

TASKER, R. and FREYBERG, P. The Final Report: Learning in Science Project. Hamilton: L.I.S.P., University of Waikato, 1982.

TASKER, R. and LAMBERT, J. Science Activities: Specific Problems. Hamilton: L.I.S.P., University of Waikato, 1981b.

TASKER, R. and OSBORNE, R.J. Working in Classrooms. Hamilton: S.E.R.U., University of Waikato, 1981.

TOM, A.R. The Reform of Teacher Education through Research: A Futile Quest. Teachers College Record, v82, n1, 15-29, 1980.

WATTS, D.P. A Constructive Alternativist View of Children's Science. Paper presented at the 4th International Congress in Personal Construct Psychology, Brock University. St Catherines, Canada, 1981.

WEIDENAAR, D.J. A Classroom Experiment Demonstrating the Generation of a Market Demand Function and the Determination of Equilibrium Price. Journal of Economics Education, v3 n2, 94-100, 1972.

WHITE, R.T. and GUNSTONE, R.F. Converting Memory Protocols to Scores on several Dimensions. Australian Association for Research in Education Conference Papers, 486-493, 1980.

WILSON, S. The Use of Ethnographic Techniques in Educational Research. Review of Educational Research, 47, 245-265, 1977.

WOLCOTT, H.F. Criteria for an Ethnographic Approach to Research in Schools. Human Organisation, 34, 111-127, 1975.