

## **Classification of the Teaching Skills based on Q-Methodology using the Perceptions of Sec. School Teachers**

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Q Methodology is a research method used to study people's "subjectivity" -- that is, their viewpoint. Q Methodology was originally developed by William Stephenson (1902-1989), an Englishman trained in physics (Ph.D., 1926), psychology (Ph.D., 1929) and psychometrics under the tutelage of Charles Spearman and Sir Cyril Burt. It has been used both in clinical settings for assessing patients, as well as in research settings to examine how people think about a topic. The International Society for the Scientific Study of Subjectivity (ISSSS) is the official organization committed to the ideas and concepts of Q methodology as enunciated by William Stephenson. ISSSS administers an email discussion list dedicated to exchange of information related to Q Methodology.

Q-methodology enjoys increasing popularity, but many people that develop an interest in Q-methodology find it difficult to gain access to background information. At the moment, Q-methodology.net provides links to existing web resources and a - hopefully growing - selection of studies. Q-methodology enjoys increasing popularity and use among scholars and students. Many people that develop an interest in Q-methodology, however, find it difficult to gain access to background information. On occasions, we found, it was an obstacle to go on with Q-methodology. For that reason we wrote down some basics in this document, which is compiled from what we think is the key literature on Q-methodology, and the most important web resources currently available. References and weblinks are provided throughout the text and readers are encouraged to look up the original materials.

The present investigation is concerned with an application of Q-methodology to classify teaching skills. Classification of teaching skills is important from the point of view of providing pre-service training to the teachers. Different teachers have different ways of Teaching. It is on the basis of the classification of teaching skills that one can determine which Skills can be used for what purpose. Attempts have already been made to classify teaching skills but the basis of preparing such classifications is not clear. The present investigation is concerned with a classification of the different skills of teaching using the Q-methodology. It is an attempt to develop Q-sorts to study the clustering of teaching skills used by teachers on the basis of

Perception of secondary school teachers during their teaching. The study is real and important as it will be possible for the investigator to explore new ideas by using Q-methodology which is Heuristic in nature and has exploratory strength.

Participants' views of the various teaching strategies and materials were evaluated utilizing Q methodology. Q methodology allows for the study of participants' perceptions and falls into the qualitative research domain. However, because these perceptions are rank ordered and factor analysis is then utilized to organize participants' perceptions into categories, the quantitative aspects of Q methodology make it a mixed methods approach. The personal profiles of participants are correlated with reveal similar viewpoints. If every participant is unique in his or her perspectives, then no factors emerge; however, if participants share common perspectives, then factors emerge that group these individuals based on their shared viewpoints [39](#). Emphasizing discovery over reasoning, Stephenson [40](#) first described Q methodology, which was highly criticized and rejected by prominent academic psychologists and psychometricians of the middle of the twentieth century despite predictions by others outside of psychology that Stephenson's work would have a profound, positive effect on methodology, especially in psychiatric and clinical settings. Brown [41](#) argued that the early contention concerning Q methodology is rooted in what is meant by 'correlating persons' and has strongly advocated for its use in the social sciences. A discussion of this issue is found in Brown [41](#) and is beyond the scope of this article. More importantly is the increasing interest in and growth of the use of Q methodology in the social sciences [41](#), and the recognition of the value of subjective communicability. By selecting Q methodology to evaluate the experience of participants in the present professional development opportunity, we purposely avoided an attempt to objectively assess the effects of the case study approach on participants' learning, which would have been impossible with the small sample size and design. Instead, the subjective focus allowed participants to measure the effectiveness of the case study in impacting their learning. Thus, participants had an active role in the workshop evaluation, which capitalized on participants' understanding of the programme's impact on their learning on their own terms. When working with professional educators who understand teaching and learning strategies, this approach seems advantageous.

### **Q-Methodology**

Q-methodology is a method of rank ordering and assigning numerals to subsets of the objects for statistical purposes. This methodology was first introduced by William Stephenson to characterize a set of philosophical, psychological, statistical and psychometric ideas oriented to research on the individuals. Q-technique is a set of procedures used to implement Q-methodology. It involves the sorting of decks of cards called Q-sorts. The sorting of cards is done by using a symmetrical distribution of the cards in to a number of piles. The method uses impassive rather than normative scale. The data are then analyzed by finding interpersonal correlations among individuals on the basis of which classification of the objects or statements is done.

Q-methodology is a technique for studying human subjectivity (Stephenson 1953;

McKeown and Thomas 1988; Brown 1980; 1993; Durning 1996). Every person perceives the world differently, and Q-methodology uses these subjective viewpoints to construct typologies of different perspectives. Q-method was developed in the 1930s by William Stephenson, a British physicist-psychologist (1935a, 1935b, 1953). Stephenson was interested in using factor analysis to correlate people with the views they held to reveal the multiple points of view that could prevail in any situation (Brown 1996, 1993).

There are two discerning factors that set Q methodology apart from R methodology. The first is the subjective nature of Q methodology versus the objective nature of R methodology. The second is the nature of the correlation and clustering that occurs with Q methodology versus R methodology.

R methodology studies the relationships among objective variables (Brown 1984). For instance, R methodology would correlate the objective variables of a high income and a high degree of education with the variable of a high degree of political participation. High income in this case might be a quantifiable annual income. High education could be quantified by the exact number of years in school. Political participation might be identified as participating in the most recent election. All of these variables are objective, externally verifiable answers where "proof and refutation are at issue" (Brown, 19993: 2). The power of R methodology is in abstracting these traits and attributes from the individuals who possess them and generalizing the findings to explain the characteristics of populations. Consequently, R-methodology typically uses large samples of subjects to explore variability between cases (Rohrbaugh 1997b).

Unlike R-analysis, which is concerned with patterns across variables, Q-methodology is concerned with patterns of subjective perspectives across individuals. A Q-methodology approach would ask a group of individuals what factors they felt were associated with political participation. All of the statements contributed by the group would be subjective, that is, there would be no right or wrong answer. Some people might feel that a strong family history of political involvement might contribute to political participation. Others might feel that being a member of the Democratic Party was a factor. Still others might cite that being involved in local associations played a role in political participation. All of the people who contribute statements would each be asked to rank order the collection of statements to reflect their personal view of how the various factors relate to their beliefs about political participation. The variation in the ordering of the statements would be subjected to statistical analysis to reveal dominant patterns of belief. In this way, Q method identifies how individuals with like views perceive an issue (Durning, 1996). Likewise it reveals how individuals with different views see the issue. Q is less concerned with the ability to generalize the findings from the analysis and uses smaller, well-selected samples to analyze variability within cases (Rohrbaugh 1997b). Q analysis does not yield statistically generalizable results. Instead, the results produce an in-depth portrait of the typologies of perspectives that prevail in a given situation.

Some people incorrectly believe that Q-method is simply an inverted R-methodology or "that it is really nothing more than the application of R-method

factoring technique to a transposed data matrix" (McKeown and Thomas, 1988: 47). However, this is incorrect, and it is important to clarify exactly what is being factored. As described above, Q-method implies that correlation and factoring of persons. R-method implies the correlation and factoring of traits. With R-methodology, correlation summarizes the relationships among the traits and then factor analysis denotes the clusters of traits. With Q-methodology, correlation summarizes the views among the people and then factor analysis denotes the clusters of people. In R-method, the traits are centered in columns and correlated together. For instance, income would appear in column A and years of education would appear in column B. In Q-method, the various beliefs of individuals would be centered in columns and there is no common unit of measurement. For instance column A might be Bill and he might have agreed strongly with the statement that "Being a member of the Democratic Party" and "Being a member of associations" are closely tied to political participation. In column B might be Ken and he might disagree strongly with the same statements. These statements would be correlated to reveal differing perceptions on behalf of these two individuals. The only common unit of measurement would be the individual's self-referential viewpoint (McKeown and Thomas, 1988; Brown, 1996). Consequently, the correlation and factoring process are very different between Q and R, and as Stephenson, the founder of Q-methodology observed, "There never was a single matrix of scores to which Q and R apply" (1953: 15).

### **Skills of Teaching**

You know that the economic prosperity and good quality of any nation depends upon the development of human resources of that nation. The significant fact in the development of manpower resource refers to the competencies and the level on which these competencies are imparted. You also know that it largely depends on those who develop these competencies. Therefore, for this purpose we need highly competent teachers for imparting these competencies. It is essential that teachers imparting these competencies should have the capability to perform their task efficiently. For this, they need to acquire requisite competencies themselves. In the present Unit we will attempt to understand as to what competencies are essential for becoming better teacher and how these competencies can be imparted.

### **Teaching: Definition**

"Teaching means many different things, that teaching act varies from person to person and from situation to situation. " (Bar, 1961) "The behaviour or activities of persons as they go about doing whatever is required of teachers, particularly those activities which are concerned with the guidance or direction of learning of others." (Ryan, 1965). "Teaching is the arrangement of contingencies of reinforcement under which students learn. They learn without teaching in their natural environment, but teachers arrange special contingencies which expedite learning and hastening the appearance of behaviour which would otherwise be acquired slowly or making scene of the appearance of behaviour which might otherwise never occur." (B.F. Skinner. 1968)

"Teaching as an act of interpersonal influence aimed at changing the ways in which other persons can or will behave." (N.L. Gage, 1963)

### **What is a teaching skill ?**

Definition of teaching skill might be one of the following :

- A teaching skill is that behaviour of the teacher which facilitates pupils' learning directly or indirectly.
- A teaching skill includes all arts and behaviour of the teacher which maximizes pupils' learning.
- A teaching skill is that art of the teacher which makes communication between the teacher and pupils sufficiently.

A teaching skill is defined as a set of behaviours associated with the teaching of the subject matter Which are especially effective in bringing about desirable changes in the teacher or the trainee who Makes practice of the skill.

**According to Gage(1968)** “ *Teaching skills are specific instructional activities and procedures that a teacher may use in his classroom. These are related to the various stages of teaching or in the continuous flow of teacher performance.*”

Attempts have been made to list teaching skills. Allen and Ryan listed the following teaching skills at Stanford University in the U.S.A.

1. Stimulus Variation
2. Set induction
3. Closure
4. Teacher silence and non-verbal cues
5. Reinforcing pupil participation
6. Fluency in questioning
7. Probing questioning
8. Use of higher questions
9. Divergent questions
10. Recognizing and attending behaviour
11. Illustrating and use of examples
12. Lecturing
13. Planned repetition
14. Completeness of communication

B.K. Passi has given the following list of Teaching Skills in his book “Becoming Better Teacher; Micro-teaching Approach” :

1. Writing instructional objectives
2. Introducing a lesson
3. Fluency in questioning
4. Probing questioning
5. Explaining

6. Illustrating with examples
7. Stimulus variation
8. Silence and non-verbal cues
9. Reinforcement
10. Increasing pupil participation
11. Using black board
12. Achieving Closure
13. Recognizing attending behavior

NCERT (National Council of Educational Research and Training) in its publication Core Teaching Skills (1982) has laid stress on the following teaching skills.

- Writing instructional objectives
- Organizing the content
- Creating set for introducing the lesson
- Introducing a lesson
- Structuring classroom questions
- Question delivery and its distribution
- Response management
- Explaining
- Illustrating with examples
- Using teaching aids
- Stimulus variation
- Pacing of the lesson
- Promoting pupil participation
- Use of blackboard
- Achieving closure of the lesson
- Giving assignments
- Evaluating the pupil's progress
- Diagnosing pupil learning difficulties and taking remedial measures
- Management of the class

Different skills are used for different purposes in teaching learning process. Constant use of the different skills by the teacher makes the teaching effective on one hand and there is improvement in the style of teaching of the teacher on the other. An organization of the different teaching skills will be helpful to make selection of the appropriate teaching behaviours to be used in the today teaching. Following is the list of teaching skills for arranging them in to a classification using Q-methodology.

1. Skill of writing instructional objectives.
2. Skill of introducing the lesson.
3. Skill of fluency in questioning.
4. Skill of explaining.
5. Skill of probing questions.
6. Skill of illustrating with examples.

7. Skill of stimulus variation.
8. Skill of silence and non-verbal ones.
9. Skill of reinforcement.
10. Skill of increasing pupil participation.
11. Skill of Using black board.
12. Skill of achieving closure.
13. Skill of recognizing attending behaviour.
14. Skill of Experimentation.
15. Skill of diagnosing difficulties of students related to subject matter.
16. Skill of using the teaching aids.
17. Skill of maintaining the science laboratory.
18. Skill of giving assignment.
19. Skill of developing critical and independent thinking among the students.
20. Skill of maintaining Discipline.
21. Skill of pacing the lesson.

### **Review of Related Studies**

Participants' views of the various teaching strategies and materials were evaluated utilizing Q methodology. Q methodology allows for the study of participants' perceptions and falls into the qualitative research domain. However, because these perceptions are rank ordered and factor analysis is then utilized to organize participants' perceptions into categories, the quantitative aspects of Q methodology make it a mixed methods approach. The personal profiles of participants are correlated with reveal similar viewpoints. If every participant is unique in his or her perspectives, then no factors emerge; however, if participants share common perspectives, then factors emerge that group these individuals based on their shared viewpoints [39](#). Emphasizing discovery over reasoning, Stephenson [40](#) first described Q methodology, which was highly criticized and rejected by prominent academic psychologists and psychometricians of the middle of the twentieth century despite predictions by others outside of psychology that Stephenson's work would have a profound, positive effect on methodology, especially in psychiatric and clinical settings. Brown [41](#) argued that the early contention concerning Q methodology is rooted in what is meant by 'correlating persons' and has strongly advocated for its use in the social sciences. A discussion of this issue is found in Brown [41](#) and is beyond the scope of this article. More importantly is the increasing interest in and growth of the use of Q methodology in the social sciences [41](#), and the recognition of the value of subjective communicability. By selecting Q methodology to evaluate the experience of participants in the present professional development opportunity, we purposely avoided an attempt to objectively assess the effects of the case study approach on participants' learning, which would have been impossible with the small sample size and design. Instead, the subjective focus allowed participants to measure the effectiveness of the case study in impacting their learning. Thus, participants had an active role in the workshop evaluation, which capitalized on participants' understanding of the programme's impact on their learning on their own terms. When

working with professional educators who understand teaching and learning strategies, this approach seems advantageous.

Stephenson was the first person to use Q-methodology to test certain theories in the fields of education and psychology. As described by Stephenson Q-methodology is a general term to characterize a set of philosophical, psychological, statistical and psychometric ideas oriented to research on the individual.

Kerlinger in a study used structured Q-sorts on a behavioural study and found many possibilities related to the use of research designs and statistics in Q-methodology research.

**Sontag** used Q-methodology to study desirable teaching behaviours and used 80-item Q-sort to study and describe the variety of teaching behaviours and the data were obtained on elementary and secondary school teachers. Fifty percent of the teachers were instructed to sort the behaviours of teachers according to their desirability for elementary school teachers and other fifty percent according to their desirability for secondary school teachers. The Q-sort results for each group were factor analyzed separately and factor arrays calculated. Four factors were obtained in each analysis.

**Broen** selected 24 clergymen for his Q-study attitudes. These clergymen were representing the full spectrum of religious beliefs and attitudes. There were five major religious groupings and four representatives in each grouping.

**Getzels** applied Q-sorts on 20-judges (experts and non-experts) with 31 drawings to find out the aesthetic sense in them. This technique of drawing was applied on them three times and the results found during all trials showed that the artists differed in themselves like Laymen but they have much more originality than the laymen.

**Kerlinger** used the Q-methodology in sorting the 80-items to explore social attitudes for testing a structural theory of social attitudes. Variables used are "Attitude" & "Abstractness". "Attitude" is further divided into Conservative and Liberal and "Abstractness" into Abstract and Specific. The items were to be fit into these categories by the sorters. According to the data, conservatives favored specific referents and the liberals favored the abstract one.

**Sharma** applied the Semantic Differential technique on 30 Teacher Trainees to classify teaching devices. The data obtained on twelve concepts and six adjective pair scales from Evaluation, Potency & Activity Categories were subjected to distance cluster analysis and four clusters of Teaching Devices were found.

### Technical overview

The name "Q" comes from the form of factor analysis that is used to analyze the data. Normal factor analysis, called "R method," involves finding correlations between variables (say, height and age) across a sample of subjects. Q, on the other hand, looks for correlations between subjects across a sample of variables. Q factor analysis reduces the many individual viewpoints of the subjects down to a few "factors," which represent shared ways of thinking. It is sometimes said that Q factor analysis is R factor analysis with the data table turned sideways. While helpful as a heuristic for understanding Q, this explanation may be misleading, as most Q methodologists argue that for mathematical reasons no one data matrix would be suitable for analysis



with both Q and R. Sorting the statements in a Q-sort

The data for Q factor analysis comes from a series of "Q sorts" performed by one or more subjects. A Q sort is a ranking of variables—typically presented as statements printed on small cards—according to some "condition of instruction." For example, in a Q study of people's views of George W. Bush, a subject might be given statements like "He is a deeply religious man" and "He is a liar," and asked to sort them from "most like how I think about George W. Bush" to "least like how I think about George W. Bush." The use of ranking, rather than asking subjects to rate their agreement with statements individually, is meant to capture the idea that people think about ideas in relation to other ideas, rather than in isolation.

The sample of statements for a Q sort is drawn from a "concourse" -- the sum of all things people say or think about the issue being investigated. Since concourses do not have clear membership lists (as would be the case in the population of subjects), statements cannot be drawn randomly. Commonly Q methodologists use a structured sampling approach in order to ensure that they include the full breadth of the concourse.

One salient difference between Q and other social science research methodologies, such as surveys, is that it typically uses many fewer subjects. This can be a strength, as Q is sometimes used with a single subject. In such cases, a person will rank the same set of statements under different conditions of instruction. For example, someone might be given a set of statements about personality traits and then asked to rank them according to how well they describe herself, her ideal self, her father, her mother, etc.

In studies of intelligence, Q factor analysis can generate Consensus based assessment (CBA) scores as direct measures. Alternatively, the unit of measurement of a person in this context is his factor loading for a Q-sort he or she performs. Factors represent norms with respect to schemata. The individual who gains the highest factor loading on an Operant factor is the person most able to conceive the norm for the factor. What the norm means is a matter, always, for conjecture and refutation (Popper). It may be indicative of the wisest solution, or the most responsible, the most important, or an optimized-balanced solution. These are all matters for future determination.

The "Q sort" data collection procedure is traditionally done using a paper template and the sample of statements or other stimuli printed on individual cards. However, there are also computer software applications for conducting online Q sorts. For example, nQue is a web-based commercial software application that uses a drag-and-drop, graphical user interface to conduct online Q sorts that mimic the analog, paper-based sorting procedure

### **Q Methodology - Advantages and the Disadvantages Kelvin Karim**

What is it? According to Niemi (1988), Q methodology is a systematic and rigorously quantitative means for examining human subjectivity. It is essentially a method for examining intensively the subjectivity of an individual or group and in recent years has become a popular tool for researchers in social sciences. Q methodology refers to

the use of Q sorting, which is a data collection technique and Q factor analysis, which is a procedure for statistical analysis. While Q sorting and Q factor analysis can be used independently, they can also be combined, enabling researchers to benefit from both qualitative and quantitative research approaches. Initially the researcher selects a set of items (stimuli) which are placed on individual Q sort cards. Collectively the cards are called a Q sort deck and may comprise of a series of statements, words, pictures, pieces of art, paintings or photographs. The Q sort deck is essentially a survey or test instrument.

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