# Nominal Group Technique and its Applications in Managing Quality in Higher Education

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**Abstract**

Quality management is an important aspect in all kinds of businesses – manufacturing or service. Idea generation plays a pivotal role in managing quality in organizations. It is the new and innovative ideas which can help corporations to survive in the turbulent business environment. Research in group dynamics has shown that more ideas are generated by individuals working alone but in a group environment than the individuals engaged in a formal group discussion. In Nominal Group Technique (NGT), individuals work alone but in a group setting. This paper shows how NGT can be applied to generate large number of ideas to solve quality related problems specifically in Malaysian higher education setting. The paper also discusses the details of NGT working procedure and explores the areas of its further applications.

**Keywords**: Nominal group technique, quality management, higher education, Malaysia.

## 1. Introduction

Implementation of many total quality management (TQM) programs requires fresh and creative ideas from the employees. The basic reason for employee involvement is that employees can give innovative ideas for organizational development. In fact, new and innovative ideas play significant role in managing quality. Many a times, these ideas when implemented entail a firm competitive advantage over its competitors. Caggiano (1999) asked: What's the most valuable resource a business can have? He himself answered: It's a supply of ideas – more specifically, good ideas. In today's nanosecond, downsized, complex business world, large companies are increasingly demanding that their people find new and better ways of getting the job done (Ditkoff, 1998). How to generate ideas? The most common way is to take the relevant people in a room and

brainstorm them. However, in reality, more often than not it has been observed that brainstorming sessions are more storm than brain, providing useless ideas (Caggiano, 1999).

There are numerous evidences in the decision making literature that the ideas generated from a group format lead to increased accuracy, confidence, and satisfaction over individual generation (Osborne, 1957; Roth, 1994). Further, research in group dynamics has shown that more ideas are generated by individuals working alone but in a group environment than the individuals engaged in a formal group discussion. One possible explanation for this is that people fear they will look foolish or stupid before the entire group and therefore refrain themselves from taking active participation in discussions. Some people are timid by nature and they prefer to remain silent in all forms of meetings. A group of researchers comprising Andre Delbecq, Andrew Van de Ven and Gustafson developed a technique called Nominal Group Technique (NGT) purported to make egalitarian participation in a group meeting (Delbecq et al., 1975). The technique has been widely applied in practice, as discussed later. However, the description of the methodology in the literature is available only in a scattered manner. This paper gives a comprehensive review of the methodology and explores many of its advantages and also limitations. Specifically, the objectives of this paper are to: (i) provide an overview of NGT, (ii) describe several operational rules for applying NGT, (iii) describe a number of advantages of NGT (all the i. ii. and iii will enable practitioners to have a capsule look on the technique), (iv) show by means of examples how to apply NGT to solve quality related problems in education, and (v) explore the areas in an academic setting where NGT can be applied.

## 2. Nominal Group Technique (NGT)

Nominal Group Technique is a structured brainstorming technique that is used to produce a large number of ideas pertaining to an issue while ensuring that all the group members have equal participation in the development of ideas. NGT is an interview technique where participants work in the presence of each other but write ideas independently rather than stating them verbally (Macphail, 2001). It is not only used to generate a large number of ideas, but also prioritize the ideas and consequently the ideas which receive majority of the votes can be selected. NGT is usually applied to identify problems and generate solutions to these problems. The technique is particularly useful for groups that are not used to interact, groups in which tension levels are often high, or groups in which status difference among members might inhibit open and frank discussion.

The technique has been extensively applied in education, business, health, social and governmental organizations (Moore, 1987). Few specific areas of application are change management (Lane, 1992; Tribus, 1992), education (Debra et al., 1998), health (Hofemeister, 1991), meeting management (Blanchard, 1992; Finlay, 1992), organizational development (Mendelow & Liebowitz, 1989), strategic planning (Sink, 1985), information systems (Havelka & Merhout, 2008), conflict resolution (Van der Waal & Uys, 2009), and cross cultural management (Ralston & Pearson, 2010).

### 2.1 Requirements for conducting a Nominal Group (NG) Session

Some amount of preparation is required for a successful application of NGT. First of all, a group should be formed comprising 7 to 10 persons who are expected to be knowledgeable about the issue for which the session is convened. It will be better if the

participants have diverse background. For a business organization, group members may come from various departments like marketing, finance, production, quality control, general administration, etc. The reason for having diverse experience among these people is that people can visualize the issue from different angles and therefore they will be able to provide different types of ideas, i.e., different views on the issue. It is recommended not to include individuals whose tendency in group meetings is usually evaluating the ideas of others rather than generating ideas from their own (Thor, 1987).

A room should be prepared which has preferably a U-shaped table. A marker board, marker pen and some papers should also be made available. A facilitator should be chosen who is expected to have prior experience in conducting or at least attending a nominal group session. The facilitator is also expected to be an unbiased person and he/she is not supposed to direct the group at reaching a particular decision. Much of the success of a NG session depends upon the ability of the facilitator.

*2.2 Steps in the Nominal Group Technique*

Following are the six steps of NGT:

*Step 1: Opening the session*

This is done by enunciating the purpose of convening the session, especially stating the issue (usually in the form of a question) for which the session has been convened. The 'issue' referred here should be such that several ideas can be easily generated about it. Note that the issue should be well understood by all the participants and they are expected to be knowledgeable on the issue, as mentioned before. In many cases, the issue is communicated to the participants well before assembling for the NG session. Even if everyone knows the issue, it is good to have it set out again in clear terms. To do this, facilitator may need to give a brief background of the issue. Furthermore, he/she should briefly mention the rules of a NG session (described later), which are to be followed during the session.

*Step 2: Silent generation of ideas in writing*

All the participants are given about 10 minutes to generate as many ideas as possible pertaining to the issue. At this stage, quantity rather than quality is emphasized. Participants are encouraged to write down whatever ideas come into their mind. Quality of ideas will be taken care of at a later step. This step of idea generation needs to be completed in total silence, i.e., no discussion among group members is permitted.

*Step 3: Round-robin recording of ideas*

In this step, the facilitator starts from one end of the room and asks each participant to provide the best idea from his or her list which he/she has generated at Step 2. If there are 10 participants, then in one round there will be 10 ideas. All the ideas have to be written down on the marker board, which is in full view of the entire group. After completing the first round, the facilitator should start for the second round and again one idea per person will be collected and in this way, 10 more ideas will be written down on the board. Collecting ideas in this round-robin fashion will be continued until all the ideas are exhausted in the participants' list. At any round, if someone does not have any idea to share, then he/she can pass for that round. But again, it is possible for him/her to reenter and provide additional ideas. On the marker board, ideas are numbered sequentially.

*Step 4: Serial discussion on the ideas*

The purpose of this step is to clarify the meaning of all the ideas. The facilitator starts from the beginning of the master list (i.e., the list on the marker board) and asks the participants whether the meaning is clear to them. If any idea is not clear, then it needs to be clarified by the person who provided it or by someone else. Note that there should not be any ambiguity on any idea. All the ideas are to be well understood by all the participants. However, the depth of the discussion should be controlled by the facilitator to ensure that a heated debate does not brew.

*Step 5: Voting to select the most important ideas*

This is the time to ask each of the participants to identify the most important 5 ideas from the master list and rate them using 1 to 5 scales according to their importance. The most important idea is to be assigned a rating of 5 and the least among these 5 ideas will receive the rating of 1. When all the participants finish the task of rating, cards are to be collected from all of them. Next, votes are written against the ideas on the board. One sample has been shown in Table 1.

Table 1. A sample of master list when votes are written down

| Serial Number | Idea | Vote |
|---|---|---|
| 1. | Idea 1 | 3, 5 |
| 2. | Idea 2 | 1, 2, 4 |
| 3. | Idea 3 | |
| 4. | Idea 4 | 2 |
| … | … | … |

When all the votes are aggregated, it is easy to pick up the 5 ideas which are most highly rated by the group as a whole. These constitute the most favored group of actions for dealing with the issue of the nominal group session.

*Step 6: Discussion on the selected ideas*

This is not an essential step of NGT but it is recommended. This helps the group to further consolidate the findings. All the above six steps have been summarized in a flow chart as shown in Figure 1.
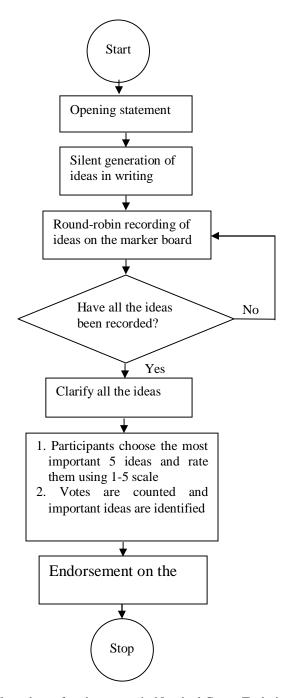
```
                    ┌──────────┐
                    │  Start   │
                    └────┬─────┘
                         ▼
              ┌─────────────────────┐
              │  Opening statement  │
              └──────────┬──────────┘
                         ▼
              ┌─────────────────────┐
              │ Silent generation of│
              │  ideas in writing   │
              └──────────┬──────────┘
                         ▼
              ┌─────────────────────┐
              │ Round-robin recording of │◄──┐
              │ ideas on the marker board│   │
              └──────────┬──────────┘       │
                         ▼                   │
                    ◇─────────◇              │
              Have all the ideas    No ──────┘
               been recorded?
                    ◇─────────◇
                         │ Yes
                         ▼
              ┌─────────────────────┐
              │ Clarify all the ideas│
              └──────────┬──────────┘
```

Figure 1. Flow chart of various steps in Nominal Group Technique

1. Participants choose the most important 5 ideas and rate them using 1-5 scale
2. Votes are counted and important ideas are identified

Endorsement on the

Stop

*2.3 Rules of conducting A Nominal Group Session*

To get the desired results from a nominal group session, the following rules must be adhered to:

*Rule 1: No criticism on anybody's idea*

The basic objective of NGT is to obtain a large number of ideas. As it has been mentioned before, participants are asked to generate whatever ideas come into their minds. When some ideas will be presented at Step 3, apparently it might seem silly, but nobody should laugh or ridicule, otherwise it will inhibit the free flow of ideas and the creativity of the individuals within the group will be lost. Furthermore, an apparently not-so-good idea can stimulate others to generate better ideas. In other words, ideas that first seem silly may prove to be very good or may lead to ideas that are very good.

*Rule 2: No evaluation about anybody's idea*

The participants are not allowed to evaluate others' ideas. If someone thinks that some participant's idea is not good enough, then he/she may not select that in the voting stage. In fact, all the inferior ideas will be dropped when voting exercise is completed.

*Rule 3: Generate as many ideas as possible*

Participants are strongly encouraged to generate as many ideas as possible. Osborne (1957) stated this rule as "the wilder the ideas the better". Initially, if you look for quality of the ideas, then perhaps not many ideas will be generated. The rationale for observing this rule is: the larger the number of ideas produced, the greater is the probability of achieving an effective solution for an issue.

*Rule 4: Modifying and combining ideas*

It is possible that two ideas, which are already articulated, be modified and combined. This will be treated as a new idea. In the literature, this phenomenon of combining ideas is known as "hitchhiking". Once again, the basic purpose of following this rule is to generate larger number of ideas.

*Rule 5: Anonymity of input*

In a NG session, ideas – not the participants who generated them are important. In the session, status of the participants is not considered. Therefore, all the inputs including the votes have to be kept anonymous.

*2.4 Advantages of a successful Nominal Group Session*

If all the above rules are observed, then we can have the following advantages in conducting a nominal group session:

1. A large number of ideas are generated and a prioritized list of ideas or solutions is obtained. Since each individual must generate ideas on his/her own, aspects that never would have been considered are more likely to be considered. In a normal interaction group, some participants prefer to confine their participation in reacting to the ideas of others. Since this is not an option available to the participants of a nominal group, a greater number of ideas will probably be surfaced than would otherwise be possible.

2. Virtually, every meeting is dominated by a few individuals. As soon as the meeting starts, they start dominating the session. Due to their verbosity and

talkativeness, others keep quite. One of the greatest advantages of NGT is that it ensures balanced participation among the group members. Due to the structure of the NGT steps and its rules, nobody can dominate the session. NGT makes the most passive persons to be active.

3. The technique overcomes 'bond' among a group of participants and it also nullifies somebody's loyalty to another. In this way, the technique overcomes the problem of "group think". It is to be noted that in a nominal group session, people form a group only for name sake; since the beginning until end, interaction among group members is minimal. For this reason, the group is called 'nominal'.

4. In an organizational setting, if the decisions are made unilaterally, then, there is an ample chance of meeting resistance at the time of implementation of those decisions. But in NGT, since the decision is through the group, there is very little chance of facing resistance while implementing the decision.

5. Usually, the quality of the ideas selected at the end of the session is very high. In fact , there have been numerous studies  which prove that the quality of NGT ideas is better than compared to other group decision making techniques, namely, interacting group, Delphi technique, etc (Hegedus & Rasmussen, 1986; Delbecq et al., 1975).

6. People do not want to look stupid in front of others. The beauty of NGT is that it short-circuits that fear by soliciting anonymous inputs from everyone.

7. The NGT takes advantage of pooled judgments. This means that the judgments of a variety of people with various talents, knowledge, experiences, and skills will be used together. By doing this, the resulting ideas are likely to be better than those that might be obtained by other methods.

8. By effectively diffusing the tension among a group of people who fail to take a unanimous decision, nominal group technique helps them to make a decision on the basis of group majority. So, NGT works as a vehicle which can bring them on a common platform.

*2.5 Limitations of NGT*

Despite the widespread use of the NGT in group decision making, it has the following limitations:

1. The technique cannot deal with more than one issue at a time. NGT is limited to a single-purpose, single-topic meeting. Further, it is not possible to change the topic in the middle of the meeting. If the group intends to resolve a number of issues in one seating, then NGT cannot be applied.

2. NGT requires considerable amount of time (about 90 minutes) to arrive at a decision. If the group wants to decide quickly, then NGT cannot be applied.

3. NGT requires a trained facilitator who is expected to have prior experience in conducting or at least attending NG sessions. Further, NGT requires a meeting room equipped with a proper seating arrangement, a marker board, pens, papers, etc. To apply the technique, the facility must be arranged.

4. NGT is a well-structured technique. The members must adhere to all the rules stated previously. The participants may feel awkward about restrictions in their interactions. After the group meeting, they may feel that the process and not they led to the conclusions they arrived at.

## 3. Applications of NGT in managing quality in higher education (HE)

### 3.1 Application 1

In this paper, we will discuss 2 applications of NGT in managing quality in the context of institutions of higher learning. Generally, any academic institution has two distinct parts – academic (teaching and learning) and administration. To impart quality education, quality must be ensured in academic as well as in administration. It may happen for some institution that the students are satisfied with the teaching standard but they lament on the poor quality of administration. This fact motivates the authors to find out the factors contributing to superior quality in the administration of an academic institution of higher learning.

Extensive researches have been conducted to improve quality in a university administration (e.g., Ruzevicius et al., 2009; Johnes, 2006). Specifically, the work of Ruzevicius et al. (2009) deals with an analysis and generalization of research materials on the process of administration. They have also proposed a model of improvement of administration quality at a higher education institution.

In order to find out the factors that contribute quality administration in a university, the present authors conducted a nominal group session comprising 14 students of the authors' TQM class. All of these students are in the final year of their Bachelor of Business Administration (BBA) program. Details of the NGT steps are described as follows (in the discussion, 'We' refers the authors):

**Step 1:** We communicated the issue well before the session was conducted. We started the session in the following way:

First, we would like to thank each of you for attending this session, called nominal group session. The technique which we will be applying is called nominal group technique. It has six steps (all the six steps are briefly described). For a successful NG session, a number of rules are to be followed (the rules are briefly explained).We have assembled here keeping an important objective in mind. Success will depend on our equal and full participation. Further, our success depends on every member fully sharing the insight from his or her own perspective. We appreciate, therefore, the willingness of every one of you to fully share your ideas and work intensively during the next 90 minutes we are together.

As you know, the task before us is to find out the factors that contribute to superior quality administration in a university. Now we are going to distribute a sheet of paper in which the ideas are to be written down. The sample is shown in Figure 2.

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Step 2: Silent generation of ideas in writing

*Nominal group technique question:* "What are the factors that contribute quality in a university administration?"

Please generate as many ideas as you can. Write these in the following table. Please do not discuss with others.

| No. | Factor/Idea |
| --- | --- |
| 1 | |
| 2 | |
| 3 | |
| ⋮ | ⋮ |

Figure 2. Blank list for idea generation

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**Step 2:** We would like each of you to take about 10 minutes to list your ideas (i.e., the factors for the present issue) in response to the issue written in the beginning of the worksheet just distributed. Write each idea in brief phrase or a few words on the worksheet. Please work independently of others. During this period, we ask you that you do not talk with other members, interrupt their thinking or look at their worksheets. Since this is an opportunity for each of us to prepare our contributions to this meeting, we would appreciate intense effort during the next ten minutes. Please proceed now.

**Step 3:** (After ten minutes) You have had enough time to generate your ideas pertaining to the issue. Now this is the time to start the third step. We are going to collect the ideas from you. The way we will be collecting ideas is: We will start from the person sitting at the end and he is supposed to give only one idea that is deemed best in his list. Then we will move to the next person and ask him to provide the best idea from his list. In this way, we will go to each and every one of you and the first round will be completed. Since there are fourteen of you, in the first round, we are expecting fourteen distinct ideas. We will write down all the ideas on the board which is in full view of you. Please remember one important point that if some idea has already been collected and written on the board and you have the same in your list, then you need not repeat the same idea. If, however, in your judgment the idea on your worksheet contains a different emphasis or variation, we would welcome the idea. After completing three rounds, the session was kept open for them and if anyone had an idea he or she was welcome to nominate that. Altogether 44 distinct ideas were collected as shown in Table 2.

Table 2. Forty four ideas generated that require attention

| No. | Ideas | Weight | Total |
|---|---|---|---|
| 1. | Motivated administrative staff | 2, 2 | 4 |
| 2. | Good reward system | | |
| 3. | Well-equipped administration | | |
| 4. | Good communication | 1 | 1 |
| 5. | Have fun | 1 | 1 |
| 6. | Good relationship among people of various divisions | 1, 5 | 6 |
| 7. | High responsibility | 3, 5, 5, 3, 3 | 19 |
| 8. | No communication gap between teachers and students | | |
| 9. | Clearly stated Vision and Mission statements | | |
| 10. | Full utilization of resources | | |
| 11. | Courtesy | 2 | 2 |
| 12. | Quick process of application forms | 2, 1, 4, 3, 2, 5, 2, 2 | 21 |
| 13. | Good leadership qualities | | |
| 14. | Quick in response | 1, 4, 3, 3, 2, 1, 4, 1, 1, 4, 2, 3, 3 | 32 |
| 15. | High employees' involvement | | |
| 16. | Effective registration in each semester | 4, 5, 3, 5, 5, 2, 1 | 25 |
| 17. | Qualified/efficient staff | 3 | 3 |
| 18. | Effective system for receiving students' feedback | | |
| 19. | Friendly/helpful staff | 5, 5, 5, 5, 4, 5, 5 | 34 |
| 20. | Zero technical defect before/during pre-registration | 3, 4, 4 | 11 |
| 21. | Proper planning | | |
| 22. | Employee empowerment | 4 | 4 |
| 23. | Knowledge of students' needs | 4 | 4 |
| 24. | Sufficient equipments provided to keep all the department' records updated | 2 | 2 |
| 25. | Strong support from upper level management | | |
| 26. | Training facilities to the employees | 3 | 3 |
| 27. | Awareness among employees regarding quality improvements | 1 | 1 |
| 28. | Long term planning | | |
| 29. | Timely communication of grades | 2 | 2 |
| 30. | Secured student records/files | | |
| 31. | Good facilities | 1, 3 | 4 |
| 32. | Enough staff | | |
| 33. | Clear policy towards quality | | |
| 34. | Robust policies | 4 | 4 |
| 35. | Ensure trust | | |
| 36. | Positive attitude towards teamwork | | |

| 37. | Top management's commitment to quality | 4 | 4 |
|-----|----------------------------------------|------|---|
| 38. | Full knowledge about all facilities in the campus | | |
| 39. | Sufficient information to the students | 4, 3 | 7 |
| 40. | Ethical behavior | 4 | 4 |
| 41. | Reduced absenteeism | 1 | 1 |
| 42. | Rapid maintenance process | 2, 1, 5 | 8 |
| 43. | Completeness in service | | |
| 44. | No gap between actions and words | | |
| | | | |

**Step 4:** We have a fairly good number of ideas. You must make sure that the meaning of all the ideas is clear to you. Beginning from the idea at serial number 1, we will be reading out all the ideas one by one and you see whether the meaning of the ideas is clear or not. Further, once again, we must ensure that there are no duplicate ideas. If any of the important ideas is duplicated (using slightly different words), then votes may be divided among them.

**Step 5:** We have now completed the clarification stage of NGT. Now the most important step lies ahead of us. From the entire list of 44 ideas, you are required to choose only five, which are, in your opinion, most important to ensure quality administration. Please write these five items on the card which we are going to distribute. Please follow the instructions given on the card. A sample of the card is shown in Figure 3. Since the instruction is very important, let us repeat it here. Out of the chosen five, the one which you feel the most crucial, assign it a weight 5, then find the second most crucial, assign 4 and so on. The least among those five will receive a weight 1.

Please choose the most important five ideas from the whole list. Assign the serial number to the idea from the master list. Then please assign weights in the following manner:

Most important idea = 5, second most important idea = 4, fifth most important idea = 1. The weights need not be sequential like 5, 4, 3, 2, 1 or 1, 2, 3, 4, 5. It could be any order like 4, 2, 5, 1, 3 or 5, 3, 4, 2, 1 and so on. Thanks.

| Sl. No. (from the master list) | Idea | Weight |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |

Figure 3. Sample copy of the card where five most important ideas are to be written down

For counting purpose, you are required to write down the original serial number (i.e., the number in the master list) in the left most column of the card just distributed to you. For

example, if you think that idea 'courtesy' is one of the five important ideas, then write its serial number 11 in the first column of the card. At this stage, please do not discuss with others and do not see the ranking of others. When you have finished, please hand over the card to us.

After collecting the cards, we wrote down the votes on the master list itself. The serial number helped us in identifying the idea on the master list quickly. The individual weights are shown in the third column of Table 2. The most important seven factors are shown in Table 3. These seven factors are chosen because they are clearly identifiable in the list based upon their total weights.

Table 3. Seven most important factors that constitute quality administration

| No. | Factor | Absolute weight | Relative weight | Requirement in percentage | Rank |
|---|---|---|---|---|---|
| 1. | Friendly/helpful staff | 34 | 0.2267 | 22.67 | 1 |
| 2. | Quick in response | 32 | 0.2133 | 21.33 | 2 |
| 3. | Effective registration in each semester | 25 | 0.1667 | 16.67 | 3 |
| 4. | Quick process of application forms | 21 | 0.1400 | 14.00 | 4 |
| 5. | High responsibility | 19 | 0.1267 | 12.67 | 5 |
| 6. | Zero technical defect before/during pre-registration | 11 | 0.0733 | 7.33 | 6 |
| 7. | Rapid maintenance process | 8 | 0.0533 | 5.33 | 7 |
| | Total | 150 | | | |

**Step 6:** Few minutes were spent further to discuss the selected issues and concluded the session with thanks to all the participants. Later on, we sent the written master list with individual votes to all of them.

**3.2 A brief discussion on the findings of application 1**

From the selected factors, it becomes clear that the university authority has to deal with motivation of staff to make them friendly who can assume high responsibilities. Providing sufficient amount of training may be one of the required activities. Secondly, the management must expedite the processing of students application forms. Clearly, the nature of the issue considered here is quite general. For the same issue, in order to obtain inputs from larger number of students, a survey was conducted in which 93 students took part. The most crucial seven factors have been shown in Table 4.

Table 4: Seven crucial factors identified through normal survey

| No. | Factor | Absolute weight | Relative weight | Requirement in percentage | Rank |
|---|---|---|---|---|---|
| 1. | Friendly/helpful staff | 176 | 0.2718 | 27.18 | 1 |
| 2. | Effective registration in each semester | 128 | 0.1972 | 19.72 | 2 |
| 3. | Quick in response | 90 | 0.1387 | 13.87 | 3 |
| 4. | Quick process of application forms | 83 | 0.1279 | 12.79 | 4 |
| 5. | Rapid maintenance process | 76 | 0.1171 | 11.71 | 5 |
| 6. | High responsibility | 50 | 0.0770 | 7.70 | 6 |
| 7. | Zero technical defect before/during pre-registration | 46 | 0.0708 | 7.08 | 7 |
| | Total | 649 | | | |

It is interesting to note that all the seven crucial factors identified in the NG session are also present among the 7 most crucial factors found in the survey, however, ranks of some of the factors have been changed. The rank correlation coefficient (r.c.c.) between the two sets of ranks obtained by the NG session and the survey is 0.8571. A rank correlation hypothesis test is performed in order to decide whether the value 0.8571 for the r.c.c. is large enough to conclude that the above mentioned two sets of the ranks are positively correlated. Let

$H_0$: Ranks obtained from NG session and the surveys are uncorrelated
$H_a$: Ranks obtained from NG session and the surveys are positively correlated

At 5% significance level and for n = 7, the critical value is 0.7140 (whereas the computed t-value is 3.7202). Therefore, the r.c.c. value of 0.8571 falls in the rejection region. Hence, we reject the null hypothesis. In other words, we can conclude that the findings in the NG session have been firmly substantiated by the larger group of students.

## 4. Application 2

As it has been mentioned previously that in any academic institution, teaching and administration goes hand in hand. The previous session pertains to the university administration. In the same way, we can find out the factors which constitute quality teaching in the class room in an institution of higher learning. Certainly, this is not a new topic to pursue. Research on quality teaching is abundant.

Teaching is one of the primary services offered by a university. Quality of teaching must be constantly monitored, especially under conditions of growing competition and limited resources (Barone & Franco, 2009). The authors propose a methodology for designing the quality of a university course. Their model is based on the concurrent use of teaching

experiments performed by a teacher and the service quality (SERVQUAL) model for the evaluation of students' feedback. Samson & McCrea (2008) focus on teaching methodology and formative assessment – both of which are vital to quality teaching. They provide a model for effective implementation of a peer review of teaching as a method to strengthen quality teaching. On the other hand, the model proposed by Chien (2007) deals with the constructs of the learning satisfaction measurement and a teaching quality management cycle to make it easy for instructors, administrators and students to jointly upgrade teaching quality.

One of the basic objectives of this paper is to show how NGT can be applied to find out ideas relating to quality management. Considering the issue of generating factors which constitute quality teaching, a NG session was conducted in which 15 BBA undergraduate students of the authors' TQM class took part. Specifically, the question considered was "what are the factors that need to be considered more to impart quality teaching in your faculty?" Since many of the students were very much interested to take part in the session, the number of participants rose moderately high.

The details of this NG session are being omitted, as it has been provided for the first session. The master list of factors that need to be considered has been shown in Table 5. The chosen seven most important factors are shown in Table 6.

Table 5: Factors that need to be considered for quality teaching

| No. | Idea | Weight | Total Weight |
|-----|------|--------|--------------|
| 1. | Study materials and lecture should be well coordinated | 2 | 2 |
| 2. | Avoid bias | 1 | 1 |
| 3. | Lecturer should be a responsible person | 5 | 5 |
| 4. | Lecturer should have relevant and in-depth knowledge | 5, 5, 3, 5, 5, 5, 4, 5, 5 | 42 |
| 5. | Use relevant and clear visual aids | 1, 2, 4, 2 | 9 |
| 6. | Equipment provided and used | | |
| 7. | Two-way communication | 5, 4, 4, 3, 3 | 19 |
| 8. | Create conducive environment | 3 | 3 |
| 9. | Use of teaching aid, e.g. PowerPoint slides with projector | | |
| 10. | Lecturer should make class interesting | 1, 4, 2, 1, 1 | 9 |
| 11. | Fun learning environment | | |
| 12. | Lecture should be delivered in such a manner that students can understand | 2, 1, 3 | 6 |
| 13. | Encourage creativity and openness | 3, 3 | 6 |

| 14. | Proper attitude of the students | 4 | 4 |
|---|---|---|---|
| 15. | Smaller number of students | 2, 1 | 3 |
| 16. | Respect each other | 1 | 1 |
| 17. | Flexibility of the lecturer | | |
| 18. | Encourage students to participate | 2, 2, 1 | 5 |
| 19. | Time management | 3, 1, 1, 2 | 7 |
| 20. | Efficient and effective delivery of knowledge | 4, 5, 2, 3, 4 | 18 |
| 21. | Use simple examples | 3 | 3 |
| 22. | Relate subject to the practical problems | 2 | 2 |
| 23. | Lecturer should gauge students' proficiency level | | |
| 24. | Lecturer should be able to recognize all the students in the class. | 1 | 1 |
| 25. | Lecturer should have proper control over the class | | |
| 26. | Proper planning on the lecturer's part | 4, 2, 4 | 10 |
| 27. | Reasonable duration of the class | | |
| 28. | Lecturer should be able to convince the students by his ideas | | |
| 29. | Give some group work | | |
| 30. | Lecturer should ask thought provoking interesting questions | | |
| 31. | Effective communication skills | 5, 5, 5, 4, 5, 4 | 28 |
| 32. | Proper choice of time slot | 1, 3 | 4 |
| 33. | Lecturer should be aware about students' proficiency level | 3 | 3 |
| 34. | Personality of the lecturer | 5 | 5 |
| 35. | Lecturer is well prepared | 1, 3, 3, 4 | 11 |
| 36. | Students centered approach in teaching | 2, 4 | 6 |
| 37. | Lecturer should discuss the answers of the mid-term and quiz question papers | | |
| 38. | Comfortable class room | 2 | 2 |
| 39. | Variety of teaching methods | 3, 2, 4 | 9 |
| 40. | Deliver lecture at a reasonable voice and speed | | |

| 41. | No interruption during the lecture | | |
|-----|-----|-----|-----|

Table 6. The seven most important requirements for quality teaching

| No | Idea | Absolute weight | Relative weight | Requirement in percentage | Rank |
|-----|-----|-----|-----|-----|-----|
| 1. | Lecturer should have relevant and in-depth knowledge | 42 | 0.3066 | 30.66 | 1 |
| 2. | Effective communication skill | 28 | 0.2044 | 20.44 | 2 |
| 3. | Tow-way communication | 19 | 0.1387 | 13.87 | 3 |
| 4. | Efficient and effective delivery of knowledge | 18 | 0.1314 | 13.14 | 4 |
| 5. | Lecturer is well prepared | 11 | 0.0803 | 8.03 | 5 |
| 6 | Proper planning on the lecturer's part | 10 | 0.0730 | 7.30 | 6 |
| 7 | Lecturer should make class interesting | 9* | 0.0657 | 6.57 | 7 |

\* Two more factors, namely, 'Use relevant and clear visual aids', 'Variety of teaching methods' also possess absolute weight 9.

### 4.1 A brief discussion on the findings of application 2

From the selected factors, it becomes clear that the university lecturers should have relevant and in-depth knowledge of their subject areas that they teach. In this sense, firstly, the university lecturers need to upgrade their knowledge by self reading and attaining higher academic qualifications in their subject areas. Secondly, effective communication with the students is also another important aspect for quality teaching. Thirdly, the communication has to be two ways where the students are also given opportunity to voice their ideas and opinions. Fourthly, lecturers also need to be effective in their teaching methodology and instructional techniques. In this way, the teaching-learning situation could be enhanced and improved continuously. Fifthly, the lecturers also need to prepare well themselves before they start their teaching. Finally, the lecturers should have a complete plan not for just one lecture but for the entire course and also they are expected to make the class interesting.

### 5. Further possible applications of NGT in managing quality in higher education

There are numerous areas in an institution of higher learning, where NGT can be applied. This paper has described only two applications. Following is a list of further possible applications of NGT in an academic setting.

1. SWOT analysis: Identifying strengths, weaknesses, opportunities and threats for certain faculty/department/unit/institution.
2. Customer survey and customer feedback is an indispensable part in quality management. A good questionnaire is essential for conducting any survey. NGT is an effective tool in developing questionnaire for any kind of survey in an academic institution.
3. What should be the vision, mission, and goals for the faculty/department/unit/institution?
4. What is the most crucial problem the department is facing?
5. What are the suggestions to improve the working condition of the department?
6. How can the surplus budget of a certain financial year be utilized?
7. What are the ways through which a local university can generate funds?
8. How can the overall communication be improved in the institution?
9. What are the issues that are to be resolved in order to ensure that the students leave the institution with a 'good' feeling?
10. What are the ways to check the high turnover in an institution?
11. How can campus security be improved?
12. How can food services in the campus be improved?
13. What measures of performance would be appropriate for the department?

## 6. Conclusion

Success of many TQM programs requires generation of new, creative and innovative ideas. These ideas when implemented may entail an organization a competitive edge over another. Researchers have developed a number of techniques for idea generation. These techniques range from highly interactive to highly non-interactive. Over the years, nominal group technique (NGT) which is non-interactive has been proven to be useful in generating large number of ideas in a wide variety of contexts. The most mentionable advantage of NGT is that it ensures balanced and fair participation among the group members. This paper has provided the details of various steps of NGT, its rules of applications and advantages, which a practitioner of the technique can use as a guide. Having done this, it has been shown how the technique can be applied to solve quality related issues in an academic setting. The findings of the present research corroborate with those found by others. For example, with regards to quality of teaching, Hsu & Chiu (2009) identified five dimensions: content of materials, learning condition, interpretation, attitudes, and responsiveness.

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