

Core Concepts in Family Medicine Education

Using a Modified Nominal Group Technique As a Curriculum Evaluation Tool

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The modified nominal group technique (NGT) is a useful and practical course evaluation tool that complements existing methods such as evaluation forms, surveys, pretests and posttests, focus groups, and interviews. The NGT's unique contribution to the evaluation process is the semi-quantitative, rank-ordered feedback data obtained on learners' perceptions of a course's strengths and weaknesses. In this paper, we demonstrate through a worked example how to use a modified NGT as a course evaluation tool in medical education.

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Evaluating medical education programs is important for at least six reasons. First, curriculum evaluation helps define the quality of educational experiences. Second, evaluation demonstrates whether or not a program is meeting its educational goals and objectives. Third, evaluation elicits feedback and satisfaction data from learners. Fourth, data obtained from evaluation can identify the need for changes that improve the program for future learners. Fifth, comprehensive, multi-method evaluation strategies document outcomes that inform funding agencies that promises made in grant proposals are being delivered. Sixth, medical educators can use evaluation data to disseminate evidence-based educational innovations through presentations and publications.

Educators use a variety of methods to evaluate their educational programs. Methods commonly reported in the literature include on-line and paper surveys of learners, focus groups, semi-structured individual and group interviews, and pretests and posttests of learners' knowledge, skills, and attitudes.

The nominal group technique (NGT) is an evaluation method that provides semi-quantitative, rank-ordered feedback about a group of learners' perceptions of the good and bad aspects of an educational program. The course evaluation data gathered in an NGT exercise are different from, and complementary to, data ob-

tained through evaluation surveys and focus groups. For example, an evaluation survey can capture numeric data on learners' opinions about aspects of a course (eg, on a 5-point Likert scale with anchors from "poor" to "excellent"), but the survey items are generated by the course organizers, not the learners. Therefore, learners may lack the opportunity to comment on issues not covered by the survey items. Focus groups encourage learners to generate evaluation issues about a course, but they involve only small numbers of learners rather than the whole cohort, and they do not generate numeric data. Also, in a focus group, one or two vocal members who hold strong opinions can influence the group discussion to the exclusion of quiet members' ideas.

In the NGT, in contrast, every participant has equal say in generating and rank ordering evaluation items. Thus, NGT course evaluations identify factors identified by learners as positive and negative and the capture of the whole group's rank-ordered opinion of good and bad aspects of a course.

This paper describes how medical school and residency faculty can use a modified NGT as an additional or alternative tool for evaluating educational programs. We illustrate the process of NGT course evaluation using a real example.

Background on the NGT

Originally developed as an organizational planning technique by Delbecq et al in 1971,¹ the NGT is a consensus-planning tool that helps prioritize issues. The classical NGT is an iterative process that encourages persons from a group to contribute their individual thoughts about an issue.² The method produces semi-

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quantitative data that has been used in change management,¹ clinical guidelines creation,³ and course evaluation in medical schools.^{4,7}

The technique can be used with whole cohorts or representative groups of learners. For example, Lancaster et al report its use with a cohort of fourth-year medical students to evaluate an elective in literature and medicine.⁷ Lloyd-Jones et al⁵ describe conducting a nominal group session with 10 non-volunteer students from a class of 206, the results of which they used to design an evaluation questionnaire for the whole class.

In its classic form, in which the group itself generates issues for discussion, the nominal group process can take 2.75 hours for 30 students. This extended time commitment may make the classic NGT impractical for many course directors in medical education and undesirable for learners. In this paper, we present a modified NGT adapted for use in course evaluation in medical education.

The Modified NGT

We simplified the classic NGT, in which participants generate ideas that can be used for brainstorming, problem solving, prioritization, or policy generation, to a simple course evaluation based on the discussion questions “What was good about the curriculum/course?” and “What were the weaknesses/areas for improvement?” This shortened the process from 2–3 hours to 90 minutes, thus increasing the practicality of the exercise.

Thus modified, the NGT can be used to elicit feedback from groups of six to 40 learners, the number commonly found in medical school clerkships and residency programs. The NGT can also be used with samples of learners taken from a larger cohort, such as a large lecture class. In fact, in the Lloyd-Jones et al study, the results from their sample of 10 students proved highly generalizable to the whole class of 206.

Participation in an NGT evaluation can be required or voluntary. Every individual contributes equally to the exercise, and the nonjudgmental process encourages individuals to give honest observations and constructive criticisms. The method is particularly useful in evaluating a new curriculum because it elicits learners’ positive and negative constructive feedback in an inclusive, nonjudgmental atmosphere. Such feedback is especially helpful in planning changes in a course for the following year.

Methods

Application of the Modified NGT in Program Evaluation

In this paper, we describe the process and data analysis of an NGT evaluation session using the example of data obtained from a cohort of 32 students in the Clinical Integration Course (CIC) at Imperial College Lon-

don in 2002. The steps in conducting a modified NGT course evaluation exercise are summarized in Table 1.

Settings and Subjects

Imperial College London is a 6-year medical school of 370 students per year who enter directly from high school. In the third year of medical school, another cohort of 30–40 students joins the course at Imperial having completed their first 2 preclinical years of study at Oxford, Cambridge, and St Andrews Universities. Unlike Imperial College students, this latter cohort has historically had little patient contact in their first 2 years. To “catch up” with their Imperial College colleagues, these students complete an intensive 3-week CIC that introduces them to clinical medicine.

CIC Description

The 3-week CIC is mostly hospital based, but pairs of students spend 1 full day each week in the offices of general practitioners (family physicians) in the community. The goals of the 3 community days are to increase students’ awareness and understanding of (1) the concepts and practice of patient-centered medicine and (2) the professional roles and responsibilities of a clinical medical student.

Teaching and learning methods include morning tutorials in the family physician’s office, patient interviews, a patient symptom survey, and shared office visits in which physicians, patients, and students all evaluate the “patient centeredness” of the encounter. Student assessment is pass-fail. To pass, students must attend all activities and complete weekly reflective written assignments. In 2002, we used a modified NGT with 32 students who completed the CIC to evaluate their 3 days of community medicine experience.

Conducting a Modified NGT Session

We allocated 2 hours on the last day of the CIC for the NGT evaluation session, although we completed the process in 90 minutes. The faculty conducting the NGT were the course organizers, which allowed the students to give direct feedback to those in charge of improving the course for next year. While the session was not compulsory, 22 of 32 students (69%) participated voluntarily. This “response rate” compares well with the generally accepted satisfactory response rate of 70% to written surveys. Response rate can be improved further by requiring the NGT evaluation. The step-by-step approach used to conduct a modified NGT evaluation session is outlined below.

Step 1. Present Evaluation Questions to the Cohort of Learners. The two evaluation questions in any NGT session should follow the rules of constructive feedback. The first should elicit positive comments about the course and the second should elicit weaknesses/suggestions for improvement. The evaluation questions

Table 1

Instructions for Performing a Modified Nominal Group Technique

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- Step 1. Present evaluation questions to the large group of learners
- What were the strengths/highlights of the course?
 - What were the weaknesses/suggestions for improvement?
- Step 2. Silent phase
- Form small groups of four to eight participants, each with a flip chart.
 - Assign a faculty facilitator, or elect a scribe for each group.
 - Issue five pink and five yellow “stickys” to each participant.
 - Without conferring or group discussion, participants record one strength on each pink sticky and one weakness/suggestion for improvement on each yellow sticky.
- Step 3. Round-robin phase
- Participants stick one pink sticky in turn on the flip chart without comment or discussion until all ideas are exhausted.
 - The facilitator or scribe groups similar comments together.
 - Repeat the process using yellow stickys for suggestions for improvement.
- Step 4. Discussion/item clarification
- The group clarifies unclear items and edits the grouped items into themes.
 - The facilitator or scribe lists and letters items in order of popularity.
- Step 5. Voting phase
- Participants rank their top five suggestions in each list from 1 to 5.
 - Participants award 5 points to their top item, 4 to the second, and so on.
 - The facilitator or scribe collects these lists for data gathering.
- Step 6. Small-group data gathering
- Scribes or facilitators add the total points for each lettered item to produce a rank-ordered, weighted list of the groups’ opinions of the strengths and weaknesses of the course.
 - Scribes or facilitators write this list (with weightings) on the flip chart to present to the large group.
- Step 7. Large-group data combining
- Reconvene the large group and examine the results from the small groups.
 - Combine the small-group scores. (Small groups in this exercise usually produce very similar factors and this can be done with minimal discussion).
 - Present the cohort’s ranked, weighted opinions of the strengths of the course and suggestions for improvement.
- Step 8. Large-group discussion around dominant themes
- Record or take notes on the rich discussion that now ensues.
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used in the CIC example were: (1) What was good about the community days on the CIC course? and (2) How could the community days on the CIC have been improved?

Step 2. Silent Phase (Small Groups). Learners form small groups of four to eight students. Each group is equipped with a flip chart. If enough faculty are present, each group can have a faculty facilitator. Otherwise, each group can elect one learner as a scribe. In our example, the 22 learners broke into four small groups and elected scribes. After the scribes issued five pink and five yellow “sticky” notes to each participant, the students considered the two course evaluation questions and, without conferring with one another and without group discussion, each student wrote one strength of the CIC community days on each pink note and one weakness/suggestion for improvement on each yellow note. (More sticky notes were available, but no student had more than five ideas in either category.)

Step 3. Round-robin Phase (Small Groups). In this phase, all learners’ input is collected and treated with equal importance. Each participant, in turn, attaches one pink note on the flip chart while reading it aloud. No additional comment or discussion is allowed during this data-gathering stage to prevent some participants from advocating for their positions and influencing other group members. If one person’s suggested strength is the same or similar to another’s, the facilitator or scribe groups these notes together. The process is repeated on a second flip chart page using yellow notes to gather the weaknesses/suggestions for improvement.

The session organizer must also ensure that groups spend approximately equal time on both evaluation questions. Since many learners may find it easier to state a course’s strengths than its weaknesses, at least in the presence of course faculty, the session organizer should encourage the groups to identify weakness and give suggestions for improvement, stressing that these suggestions are often very helpful in improving the course.

Step 4. Discussion/Item Clarification (Small Groups).

During this phase, the group clarifies unclear suggestions and edits the grouped items into themes, without discarding any item. The facilitator or scribe then writes a list of all themes on the flip chart, most popular first, and labels them A, B, C, etc.

Step 5. Voting Phase (Small Groups). Participants rank from 1 to 5 their top five strengths and suggestions for improvement from the list generated in Step 4. They then award 5 points to the first lettered item on their voting list, four to the second item, and so on. The facilitator or scribe collects these lists for data analysis.

Step 6. Small-group Data Gathering. Each small-group scribe or facilitator then adds the total points for each lettered item to produce a rank-ordered, weighted list of the small groups' opinions of the course's strengths and weaknesses/improvements. The scribes or facilitators write this list (with weightings) on the flip chart so they can present their small group's findings to the large group.

Step 7. Large-group Data Combining. Small groups in this exercise usually produce similar lists of strengths and weaknesses/suggestions for improvement, and the weighted item scores can usually be combined with minimal discussion. Combining the scores from the small groups produces a final rank-ordered, weighted list of the cohort's opinion of the strengths and weaknesses/opportunities for improvement of the course. As an example, the cohort of 22 CIC students' rank-ordered, weighted suggestions about the community experiences on the course are shown in Table 2.

Step 8. Large-group Discussion Around Dominant Themes. The large group of learners then reconvenes to examine the findings from the small groups as displayed on their flip chart pages. The group discussion that ends a modified NGT session is often frank and rich, so it is worthwhile to transcribe notes from this discussion.

Sample Results From the CIC Nominal Group Evaluation

The data table from the CIC course evaluation shows that, overwhelmingly, students considered patient contact to be the best part of their CIC community medicine experience. In the subsequent large group discussion, students confirmed that they were eager to see patients because that was why they entered medical school and why they had "endured" their 2 preclinical years. Students also liked the one-to-one contact with family physicians in the community, seeing how the doctors worked, and discussing clinical matters with them. However, the students also offered numerous suggestions for improving their CIC community medi-

cine experience. Most students felt that almost all activities except seeing patients "wasted their time." More than 50% of the students said that the course's reflective written assignments were excessive or unhelpful. However, in the large-group discussions, a minority of students stated that they liked these reflective assignments and felt that they learned from them. Most interestingly, the CIC faculty learned for the first time in the large-group discussion that students from Cambridge University, who made up more than 75% of the CIC class, had already experienced some early clinical contacts that were similar to many aspects of the CIC experience in both hospital and community settings. Contacts with Cambridge faculty confirmed the contents of their early clinical course. Thus, because most CIC students came from Cambridge, the CIC was replaced by a much shorter experience for Oxford and St Andrews students for 2003. In this case, the modified NGT evaluation approach generated student feedback that led to the discontinuation of redundant course content, freed curricular time, and reduced faculty effort.

Discussion

Advantages of the NGT As a Course Evaluation Tool

As a course evaluation tool, the NGT provides a constructive, problem-solving approach that permits equal participation by all group members, avoids disproportionate influence by vocal individuals on the group process, and reduces the pressure to conform to the group opinion. In our experience (with both clinical and pre-clinical students and with either volunteer or required participation), participants appreciate the chance to give meaningful feedback and make suggestions about their educational experience. The NGT format, by providing a safe forum for these suggestions, can generate a greater number of creative ideas and comments than might be gleaned from a simple survey or single focus group. Finally, because conducting an NGT session is simple and straightforward, it requires minimal faculty development, minimal preparation time, and few resources. Faculty members can successfully conduct NGT evaluation sessions after reading a set of instructions (eg, this paper) or by attending a single workshop or training session.

Limitations of the NGT

In our experience, learners (like faculty members) often find it easier to give positive than negative feedback, at least in face-to-face discussions, thus; it is important for faculty to stress to participants that they are equally interested in their course's weaknesses as its strengths. For the NGT technique to be of value, particularly when used regularly (eg, each year or rotation), course faculty must be willing to listen and act on the group feedback. However, learners may make suggestions for improvement that might be impractical for financial or logistic reasons, of which they have

Table 2

Combined Data on What Was Good and What Could Be Improved About the CIC Community Days

<i>Rank Order on What Was Good About CIC Community Days</i>	<i># of Students</i> <i>n=22</i>	<i>Score</i>	<i>Rank Order on What Could Be Improved About CIC Community Days</i>	<i># of Students</i> <i>n=22</i>	<i>Score</i>
1 Contact with patients	22	81	1 Wasted time during attachment—bring in patients*	16	47
2 Insight into work of family physicians (eg, sitting in)	14	47	2 Written assignments: longer and fewer or none	11	42
3 Interesting discussions	13	38	3 Shorter time in the community	9	33
4 Identified family physicians	8	30	4 Similar to course at Cambridge*	6	29
5 Increased communication skills	4	16	5 More talking to patients, eg, in consultations	6	26
6 Introduction to history taking	4	14	6 Should allow “proper” history ± clinical skills	9	23
6 Patient view of illness	4	14	6 Improve/remove questionnaire	6	20
8 Home visits	5	11	8 GP surgery too far away	4	20
8 Good group size	5	11	8 Inform patients in advance	4	18
10 Relaxed atmosphere	3	8	10 Exercise difficult because of patient mix	15	13

* In the large-group discussion, most students defined almost any activity at all as a “waste of time” if it did not involve direct patient contact.

CIC—Clinical Integration Course
GP—general practitioner

limited understanding. Also, while learners have strong opinions on what they like and dislike about a course, these preferences may not correlate with their educational needs. For example, from our case study, most students described almost all activities apart from face-to-face time with patients as “a waste of their time.” As a group, they demonstrated little understanding that they might benefit from some background knowledge of basic communication and physical examination skills before they saw patients.

Conclusions

The modified NGT is a practical course evaluation tool that can replace or complement other tools such as learner surveys and focus groups. Its advantages are that it produces rank-ordered, weighted, semi-quantitative data on learners’ perceptions of the strengths and weaknesses of a course, generates both positive and negative feedback, and minimizes the influence that a “vocal minority” of learners with strong opinions can have in typical focus-group settings. The time required to conduct the modified NGT as we report it is not appreciably more than for focus groups. NGT is a valuable tool that may be used to evaluate both new curricula and established courses or programs.

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