Horizons of Holistic Education
Vol-2, April - June 2015, pp. 79-89

p ISSN : 2349-8811
e ISSN : 2349-9133

DEVELOPING PERSONALITY OF SCHOOL STUDENTS THROUGH CO-CURRICULAR ACTIVITIES SOME THOUGHTS AND EXPERIENCES

Sudhakar C. Agarkar*

VPM's Academy of International Education and Research, Thane, Maharashtra, India,
Email: sagarkar@vpmthane.org

Received : 2 May, 2015 Accepted : 16 June, 2015

ABSTRACT

Formal schooling does little to develop students' personality to create their mark in the society and face the challenges of modern world. It is, therefore, necessary to undertake necessary co-curricular activities to achieve holistic development of school students. This article identifies crucial traits of the personality that a future citizen must possess and suggests relevant activities to achieve them at school level. First hand experiences in developing some of the major personality traits among school students in their formative years are described.

Key-words: *Personality development, Curricular activities, Interpersonal skill, Creativity, Writing skill*

* *Author for correspondence*

INTRODUCTION

School education in India focuses its attention on information. A variety of information from different disciplines like science, mathematics, history, geography, civics and languages is put into the heads of the students. They are expected to remember it and reproduce at the time of examination. Those who can recall relevant information from their memories and put it down on the paper in a stipulated time are rewarded with good grades in written examinations. Remembering and reproducing information is certainly a skill worth nurturing. But this alone does not guarantee the development of students' personality. Education is expected to bring about holistic development of human beings. It can be achieved by giving attention to the overall personality of the school going child in his/her formative years. This paper identifies a few crucial personality traits that would be useful for the students in their lives and discusses the methods to develop them in school set up.

The Concept of Personality

The word personality is derived from the Latin word *persona* meaning the mask which the actors wore on the Greek and Roman stages to distinguish their roles and to amplify their voices. Personality can be defined as the quality that marks off any one member of a group as being different from any other member of the same group. Personality can also be viewed as an organized human whole which acts towards the fulfilment of purpose. It is the sum total of all tendencies that an individual has inherited and of those that he/she has acquired by experience.

The three principal raw materials of personality are physique, intelligence and temperament. They are determined both by heredity and by conditions subsequent to birth. We have no control over the heredity characteristics. They are determined at the time of conception and are carried throughout the life. Nevertheless, we certainly have a control over environmental factors. Influencing home environment

might be a tall order. Nonetheless, creating conducive environment in the school to mould the personality of a child is within our reach.

Crucial Personality Traits

Personality as stated above is a broad term and involves so many things. For the sake of practical feasibility let us identify a few crucial personality traits that would play an important role in the life of a child. In this post-industrial era the demands placed on the world citizens are manifold. Taking these demands into account one can identify ten crucial personality traits. They are 1. Reading Ability, 2. Writing Skill, 3. Oral Communication, 4. Questioning techniques, 5. Interpersonal skills, 6. Observational skills, 7. Problem solving, 8. Creativity, 9. Time management and 10. Decision making. Attempts need to be made to inculcate all these skills among the students.

Discussion with practising teachers reveals that they are overburdened by the demands to complete the course, arrange tests and assess examination papers. Almost all the teachers emphasize that there is hardly any time left at their disposal to undertake personality related activities. There is certainly a truth in what the teachers say. It is, therefore, suggested to undertake co-curricular activities to build students' personality. Apart from the activities undertaken in the school campus there is a good scope for channelizing students' leisure time at home fruitfully.

1. Reading ability

Reading ability is the gift given to a literate human being. The term reading is quite broad. It involves recognition of words/sentences and making a meaning of the written material. In addition, it also envisages understanding the meaning between the lines. A cursory look at the reading ability of school students shows that only a few fortunate students are able to master this skill. A study was conducted to understand the reading difficulties faced by socially disadvantaged students studying in standard 8 of the schools managed by the Bombay Municipal Corporation (BMC). It was revealed that students had difficulties in reading the paragraph with proper diction and pacing of words. Their ability to catch the crucial point put forth in the paragraph was not developed properly. Hence, comprehension exercises were arranged for these students. Paragraphs were identified from the literature that had clear messages and were given to students individually for reading. They were then asked to read the paragraph, get the meanings of difficult words clarified from tutors and prepare a short summary of the paragraph. In the initial period students resorted to reproducing important statements from the paragraph as its summary. Guidelines were offered on how to identify the central theme of the passage. Such exercises carried over repeatedly helped students develop reading skills among the secondary school students chosen for the study (Kulkarni and Agarkar 1985).

Making a meaning out of technical article is different from that of a story. An experience from a rural secondary school of the state of Maharashtra is worth mentioning here. A group of students were given a paragraph to read that used technical jargon profusely. It was found that students had difficulties in decoding the meaning of technical terms. An

attempt was made to bring out the etymology of the technical term referring to its root word, suffixes and prefixes used. This effort bore fruits and students could develop the habit of deriving meaning of new words that they encountered. Technical articles often make use of graphs and tables. Inputs had to be given to make meaning out of statistical data presented in the forms of graphs, charts and tables. These exercises conducted for a few days enhanced students' confidence to read technical material and share its summary with their colleagues.

2. Writing skill

It is expected that an educated person has a good writing skill to express his/her views effectively. It is, however, a pity that only a few can master this skill during their school days. In present school education students are often forced to reproduce the statements written in text books. As a result, they hardly get an opportunity to think and write on their own. It is, therefore, suggested that ample opportunities be provided to the students to express freely what they think or feel. It could be a memorable experience that a child had, a fiction story, life sketch of a famous person or commentary on present situation. Important aspect of this exercise is to make the child think on how to put down his/her ideas effectively. Let the child struggle for a suitable word to express his/her feelings. It is through these efforts good that a good writing skill will develop.

In a Talent Search and Nurture Programme (TNP) undertaken in Mumbai by the Homi Bhabha Centre for Science Education (HBCSE) an attempt was made to encourage students to undertake creative writing. They were requested to write on the topics of their choice. The response to this appeal was overwhelming. Using the free time available at home students came out with a large amount of essays, skits, poems and fiction stories. The best entries were given prizes and were displayed on a display board for the use by others. A compendium of these writings has been brought out in the form of a book published by HBCSE (Kulkarni and Agarkar, 1992).

3. Oral communication

It is well known that a person with a good oral communication can impress upon a group quickly and get the things done for his/her benefit. We have often seen that a talkative salesman can sell his goods even if the buyer has no real intention to buy. Like business, the oral communication is important in all walks of life. It is a pity that this faculty remains underdeveloped among a large number of students coming out of school systems in India. Co-curricular activities are, therefore, needed to be arranged for developing communication skills among the students. They could be competitions like debate or elocution competitions organized on some special occasions in the school. Efforts must be made to involve as many students as possible in these competitions. In addition, opportunities can be given to the students to speak on various occasions like school assembly, teachers' day, annual gatherings, etc.

Mere speaking opportunity is not enough to develop effective communication skill. Appropriate guidance from experts is required to find out lacuna and improve upon them. Oral presentation involves (a) planning a presentation, (b) building the content,

(c) looking for catchy introduction, (d) designing the conclusion and (e) setting up a good rapport with the audience. Along with verbal mode, non-verbal mode of communication is also equally important. The students need to be given guidance in these matters too. Guidelines to make use of appropriate visual aid or an instrument also play a crucial role in developing effective communication skills. Above all, it is important that students are given ample opportunities to practice before a sympathetic but critical audience who should provide immediate but truthful feedback for improvement.

4. Questioning Technique

Children are curious by nature. Young child goes on asking questions on various issues. However, as the child enters into formal schooling his/her curiosity behaviour gets affected negatively. School curriculum hardly provides opportunities to deal with children's questions. On the other hand, schools curb their natural curiosity and make them passive listeners. It is possibly because of this reason that George Bernard Shaw has said "The only time my learning was stopped was when I was in the school". In the present scenario classroom teaching is controlled by prescribed syllabus and examinations. Teachers have the major responsibility of 'covering' the syllabus. Added to it, they have to deal with a large number of students in the classroom simultaneously. These conditions create insurmountable hurdles for teachers in encouraging students to raise questions and answer them in the classroom setting. Nevertheless, a school can organize question answer sessions as a co-curricular activity. An English Medium School in Virar, close to Mumbai, initiated this activity by placing a "Question Box" at the entrance of the school. Answers to selected questions from the box were displayed on the blackboard regularly. This activity resulted into the collection of questions raised commonly by school students. With the help of these questions school teachers have started modifying their lesson plans.

Marathi Vijnan Parishad is a voluntary organization in Maharashtra engaged in spreading scientific literacy among the masses through Marathi (the language of the state of Maharashtra). It organizes annual conventions every year in different parts of the state. A three day annual convention was arranged in a town called Wani, a taluka headquarters of the district of Yeotmal, in November 2007. Question-answer session with school students was organized as a part of the programme. For convenience students were appealed to put their questions in a Question Box placed close to the podium. To the surprise of the organizers the box was full in a day with number of questions totalling to about 5,000. The convener had a tough time selecting relevant questions for an hour long question answer session. As one can imagine only a few questions could be dealt with during the session.

But the programme has surfaced the felt need of student community. They had raised all sorts of questions starting from their own body to geostationary satellites. The analysis of the questions brought out the fact that the students lacked proper questioning technique. They could not put the question precisely and in proper words. This is an important skill that has to be developed to make the child an information seeker. What can be done in

this context is to provide an opportunity to the students to frame questions to get specific information. If a child wants to know the circumference of the earth he/she should say it clearly. Ambiguities should be avoided in the questions. These aspects are of great importance in life if one wants to get specific information. Attempts made to develop this skill systematically are found to fetch good dividends (Agarkar, 1998).

5. Interpersonal skills

The child is the member of the family and of the society. He/she has to interact with relatives, friends, neighbours and school members. In the later life he/she will have to interact with people from different walks of life like businessman, lawyers, engineers, doctors, bureaucrats, politicians, etc. The skills to interact with these people need to be developed at the school stage itself so that it can be refined as and when required. Main components of interpersonal skills are to understand the viewpoints of others and to convince others in what one believes is true. Different societies have different values. The value respected in one society need not be respected in other society. A person talking to another person from a different culture needs to know these differences. Otherwise, they might end in creating misunderstanding. Educational tours arranged to expose the students and teachers to different cultures are found to prove useful in this context (Agarkar and Bedekar, 2004).

Schools can develop interpersonal skills among the students through certain simple activities. Giving a project to work in small groups is one such activity. In doing so, children will learn to take into account other's opinion and take decisions collaboratively. Organizing group discussions could be yet another activity to enhance interpersonal skills. Sports are known to enhance interpersonal skills among the students. A culture of team work is found to help students develop the habit of cooperation among different members. It must be ensured that there is rich peer interaction among students in the school premises.

Indian ancient Gurukul system of education gave much importance to enhancing interpersonal skills among its students. In this system students of different ages lived and worked together cooperatively. Not only the child had the opportunity to interact with his/her classmates but also had the chance to interact with seniors as well as juniors in the school. At the same time these students had an opportunity to meet, talk and negotiate with adults living in the Ashram and with common people in the society outside the school premises. As a result, students from Gurukul system came out with excellent interpersonal skills and could manage with various types of persons in the society. We must draw lessons from our ancient traditions (Scharfe, Hartmut, 2002).

6. Observational skills

Minute observation is the key to the success. A batsman facing the ball observes the action of the bowler minutely and takes a position even before the ball is bowled. An actor observes the behaviours of common people on the street and enacts them faithfully. A mimicry person observes the behaviour of a celebrity minutely and tries to imitate him/her perfectly. In the field of science minute observations

have played a crucial role in new discoveries. It was Alexander Fleming who had observed the effect of penicilium spores on bacteria that led to the discovery of penicillin and important drug. It was the minute observations of Earnest Rutherford regarding the reflection of alpha particles from the thin sheet of gold that led to the discovery of atomic structure.

Although the importance of observational skills is recognized by all, students get limited opportunity for detailed observations in their formal schooling. Laboratory is one such place where such opportunities can be offered. However, strict time schedule followed by the school for laboratory work, fast pace with which experiments are performed and haste to reach to the conclusion deprives students from detailed observations. If someone attempts to do that he/she is discouraged as laboratory programme is given low importance in school examinations. An anecdote in this context might prove the point.

The author once conducted a simple experiment from school textbook and asked the students to note down all the minute details. The activity consisted of lighting a candle and putting an inverted glass tumbler over it. As anyone would guess the flame of the candle got extinguished within a short time. When students were asked to describe the activity in detail they had only one statement to say "Candle extinguished as oxygen exhausted". It took efforts to convince the students not to reach to the conclusion but to describe all the minute details that they had noticed. With some persuasion they could come out with the following list of observations related to the burning and extinction of the candle.

1. The candle and match sticks were taken out from the box and placed on the table.
2. A stick was taken out from the match box.
3. The stick was held in the hand pointing its burning material downward.
4. The burning material of the candle was rubbed against the side of the match box.
5. The stick was allowed to burn well and then taken close to the wick of the candle.
6. Holding the stick close to the wick enabled the candle to burn.
7. As the candle started burning the upper part of the candle started melting.
8. Candle flame was yellowish and sooty.
9. One could three zones in the candle flame, the upper part being blue.
10. A glass tumbler was then taken and inverted.
11. The inverted glass tumbler was placed ensuring that it does not touch candle flame.
12. As the tumbler touched the table a smoke was seen on its upper part.
13. One could also see small droplets inside the tumbler.
14. The length of the flame went on decreasing from the top.
15. The flame extinguished with the liberation of lot of smoke.

It is envisaged that repeated efforts in this direction can enhance observational skills of the students. The habit of minute observation should be carried over beyond school activities. One can try it during educational excursions conducted usually by schools. Encourage the students to note down as many details as possible. Diary writing could come

handy in this context. Competitions can then be arranged among students to red their diary and the best observer can be rewarded.

7. Problem Solving

The objectives of school education are changing fast. In the post-industrial period we wanted people who would take care of the machinery, keep an account of the production and sale the finished product in the market. These objectives were fulfilled faithfully by school education for the past few centuries. In the present information society the demands from school education have changed. What is expected is that the child coming out of school should become the member of the CMI (Contextualized Multiple Intelligence) society and undertake problem solving activities independently (Cheng, et al 2002. In order to fulfil this demand the schools are expected to develop problem solving capabilities among the students. The present banking system of education hardly provides opportunities for problem solving exercises. What is called problem solving in school set up is to follow the path suggested by someone to arrive at the known solution. There is hardly any opportunity for creative thinking and deal with open ended problems (Shimada, 2007). On the contrary, novel methods of dealing with problems in mathematics or in science are penalized instead of rewarding.

Over the last three decades the movement of Science Exhibitions has taken firm roots in India. These exhibitions are held every year first at the taluka, then at district, at state and finally at national levels. Parallel to the exhibitions arranged by the National Council of Educational Research and Training (NCERT) the National Council of Science and Technology Communication (NCSTC) arranges another competition in science called "Children's Science Congress". Recently, Department of Science and Technology has come out with yet another scheme called INSPIRE. All these schemes provide opportunities to school students to undertake action research and to try out novel problem solving ideas. In order to benefit from these schemes, students should be exposed to relevant social problems and asked to tackle them on their own. This opportunity needs to be distributed among different categories of students so that a large number of students get benefited from it. Preparing science projects for above-mentioned competitions could become a yearlong activity of the school without disturbing the teaching schedule. Innovative ideas presented during these competitions can be put together for the benefit of the society in general and for the younger students in particular. There is a general feeling among the teachers and parents that the participation in these competitions may have adverse effect on the scholastic performance of the students. It must be noted that no such negative effect take place. Instead, children participating in science exhibitions would acquire skills that would prove useful for them throughout their lives.

8. Creativity

Nurturing creativity as a skill is should be the national priority in school education. Design and technology is taught as a compulsory disciplines in schools of many developed countries. In India, there

is no provision of teaching it as a separate subject. Nevertheless, its importance in enhancing creativity among the students is beyond doubts. Science exhibitions, as discussed above, provide opportunities to display creativity by the students related to science. However, students might have creative ideas in different fields like music, painting, design, literature, etc. They need to be first given platform to display their talent and then nurture their creativity by providing them appropriate opportunities. For example, the school might like to arrange Drawing/Painting competitions for those who have flair for these fields. Similarly, competitions in music can be arranged for those who have interest in that area. Some students have flair for writing. They can be encouraged to undertake writing on topics of their interest. These activities can be best undertaken during the leisure time available to the students. Schools however, need to guide them and encourage them at appropriate places.

In one of the educational projects undertaken by the author students were encouraged to use their Diwali vacation creatively. In India there is practice of using decorative lanterns during Diwali, a festival of light. Hence, students were asked to engage themselves in making decorative lanterns of their choice. They were given freedom to choose the material and think of different shapes. It was found that they could make lanterns using throw away materials like used greetings cards, plastic bottles, bangles, home utensils, etc. Some used thermocole, a light white material to make lanterns. The shapes chosen were manifold and the ingenuity displayed in these lanterns was noteworthy (Agarkar, 2010).

9. Time Management

Time management is the useful skill that one needs at every walk of life. In spite of its importance it is a neglected skill as far as school education is concerned. Except the examination hall time is hardly given any importance. Moreover, inputs on how to manage the time are seldom provided to the students. Time available to us can be divided into three parts: Committed time, Maintenance time and Discretionary time (Hopson and Scally, 1991). The first category of time refers to the time that we have committed to our work. In case of students the committed time would include time used in attending school, undertaking homework and travel time to and from school. The second category called maintenance time is the duration spent in maintaining ourselves like eating food, taking exercise, taking bath, sleeping to give our body much needed rest, etc. Students do not have much control over these two types of time. Hence, they should focus on using the third category of time judiciously. It is named discretionary time as we can exercise our discretion on how to use it. Using it fruitfully would lead to achieving great heights in the life. This aspect can be better convinced by practices than by preaching. The best method would be expose the students to someone who uses his/her discretionary time judiciously. The author has found out one more method that proves useful in making children realise the importance of using free time fruitfully. It is to tell them stories from the lives of successful people. Three such anecdotes are cited below from the lives of three great scientists.

1. Michael Faraday was working as a servant in a book binding shop. He had to spend stipulated

time in the shop and like all other boys of his age had to spend considerable time for his maintenance. Thus, he was left with very little free time. In spite of these limitations he decided to read books that came for binding and conduct experiments suggested there. This is how he has developed skills of experimentation that helped him become a great experimental scientist of 19th century.

2. Albert Einstein, after his education, looked for an academic position in the university but failed. He ultimately found a job as a clerk in the patent office. He had used his discretionary time fruitfully in working out complicated mathematical problems in Physics. This work led to the formulation of a famous theory of relativity. Publication of the work gave name and fame to Einstein. He is considered to be the greatest scientist of 20th century.
3. Chadrasekhar Venkat Raman took up a job in Audit office in Kolkata after his education. His office work was so monotonous that he started looking for some challenging work which he found in the laboratories of the Indian Association for the Cultivation of Science (IACS). He started spending his spare time in those laboratories conducting experiments. He then left the high salaried government job and joined IACS on a meagre stipend to continue his scientific work. His work eventually led the discovery of law in spectroscopy which is known as 'Raman Effect'. Raman was given Noble Prize in Physics in 1930 for this important discovery.

10. Decision Making

It hardly needs to be said that decision making is the skill that demands attention. We experience every day that poor decision making at different levels in our country leads to the wastage of resources and manpower. Decision making skill, therefore, scores high on all personality traits. Developing this skill is also a challenging task. Everyone makes some decision or the other every day. But informed group decision is considered to be the best. For this the child needs to develop the habit of listening to others opinion, analyse the pros and cons of the decision and find out relevant information and data available before arriving at a particular decision. Exercises in this regard needs to be worked out and given to the students for practice. One has to remember that the children might not be able to perfect this skill in their student lives. Nonetheless, they need to be familiarized with the effective methods of decision making in their formative years. At the school level students can be offered decision making opportunities by encouraging them to form different clubs of students like Science Club, Geography club, Nature club, Sports club, Mathematics club, etc. Let the students plan and execute the activities of these clubs on their own. Teacher's role would be to ensure that decisions are arrived based on the consensus reached in the group. He/she might like to bring out pros and cons of a certain decisions taken by these groups. Children should be allowed to commit mistakes, learn through them and rectify the decision.

The Vidya Prasarak Mandal (VPM), Thane in collaboration with the Asian branch of the

Commonwealth Association of Science and Technology Educators (CASTME-Asia) has been organizing educational tours of Indian students to Oxford, Cambridge and London every year. Participants chosen for the tour are involved at every stage of decision making like journey within the country, places to be visited, time to be spent at every place, etc. This exposure, it is found, enables them to develop the faculty of decision making taking into account various related parameters (Agarkar, 2015). Recently, an Industrial visit was arranged for the students of management institute to Singapore. The entire planning of the tour was entrusted to the participants under the guidance of a senior faculty. The role of a faculty member was to provide relevant information and help students arrive at a proper decision taking into account the constraints of time, finance and transport.

Conclusions

The paper attempted to deal with an important issue of personality development. It has identified ten personality traits that are useful in life. It has been emphasized that they demand attention at school level itself. Some co-curricular activities are suggested to nurture these traits among the students. Relevant field experiences are presented to support how they can be developed though activities undertaken either in school set up or outside the school campus. It is expected that serious attention given to these aspects at school level would lead to citizens with appropriate skills and temperament to make the future world a better place to stay.

Each of the ten traits mentioned in the paper demands relevant information and practice. Libraries are known for providing information. But one must know how to make use of the library effectively. Information and Communication Technology (ICT) has brought the knowledge to our doorstep. In this case too there is a need to use discretion to get relevant information. Now a days, space based resources are also used to provide useful inputs (Lombardi, 2006). So availability of information is not a problem at all these days. There is, however, no substitute to practice. Candidates can either practice in natural settings or in a simulated settings. Getting exposed to the problem and dealing with it whole heartedly is the only pathway of skill development. There is no royal road to acquiring skills that builds ones personality.

It must be noted that the role of a facilitator is very crucial in developing the personality of a child. Teachers are certainly good facilitators. However, it is not necessary that a facilitator has to be employed in a school as a teacher. Anyone interested in building a good society can take the role of a facilitator. Parents can play this role. It is often said that mother is the first teacher of a child. In addition, members of voluntary agencies can play the role of facilitators. Now a days, many voluntary agencies arrange vacation camps for school students. These camps, if planned properly, can become the places of personality development.

Acknowledgements

This paper was developed during the period of a Visiting Fellowship at Centre of Advanced Study in Education (CASE), University of Baroda, Vadodara offered to the author. He would like to express his gratitude to Dr. D. R. Goel, Professor Emeritus, CASE for his guidance and active participation in academic discussion.

References

Agarkar S. C. (1998). Inquisitiveness among the underprivileged: Analysis and interpretation, *Recent Researches in Education and Psychology*, Vol 3, Nos. III-IV

Agarkar, S. C. and Bedekar, V. V. (2009). Learning from different cultures: A case of UK India teachers' exchange programme (with Bedekar V.V.), In Barry Van Driel (Ed.) Proceedings of the International Conference on Intercultural Education, Athens, Greece.

Agarkar, S. C. (2010). Combating learning hurdles arising out of social deprivation, In Yew Jin Lee (Ed.) *Handbook of Research in Science Education: Research in Asia,* Rotterdam: Sense Publishers.

Agarkar S. C. (2015). *Educational Tour to Oxford and Cambridge* (in Marathi), Thane: Vidya Prasarak Mandal

Cheng, Y.C., Tsui, K. T., Chow, K. W. and Mok, M. M. C. (2002) Searching for paradigm shift in Subject teaching and teacher education, In Yin Cheog Cheng, Kwok Tung Tsui, King Wai Chow and Madalena Mo Ching Mok (Eds.) *Subject Teaching and Teacher Education in the New Century: Research and innovation*, Dortrecht: Kluwer Academic Publishers.

Kulkarni, V. G. and Agarkar, S. C. (1985). *Talent Search and Nurture among the Underprivileged*, Mumbai: HBCSE, TIFR.

Kulkarni, V.G. and Agarkar S C (1992). *Vacation Assignments to Bring about Personality Development of Students* (in Marathi), Mumbai: HBCSE, TIFR.

Lombardi, Doug (2006) Implementing a goal driven and public outreach program, In Sudhakar Agarkar, Sanjay Limaye and Rosalyn Pertzborn (Eds.) *Proceedings of the Indo-US Workshop on Utilization of Spaced-based Resources to Enhance Science Education in India,* Mumbai: HBCSE, TIFR

Scharfe, Hartmut (2002). *Education in Ancient India*, Leiden, Boston, Koln: Brill, pp 285-286.

Shimada, Shigeru (2007). The significance of an open ended approach In Jerry Becker and Shigeru Shimada (Eds.) *The Open Ended Approach: A New Proposal for Teaching Mathematics,* Reston, Virginia: National Council of Teachers of Mathematics.