

## **APPENDIX A**

### **QUESTIONNAIRE**

#### **FOR TEACHERS TEACHING SCIENCE AND TECHNOLOGY**

The objective of this research is to obtain information on the teaching and learning of Science and Technology (S & T) at the secondary schools.

All information provided by you is purely for the purpose of this research and will remain confidential.

True and precise answers are most important in order to obtain meaningful results for this research.

Your contribution and cooperation is vital in this research towards the development of the country's future in science and technology.

Thank you. Your cooperation is deeply appreciated.

There are 11 pages (including the cover page) in this document involving 4 main parts:

PART A: Appraisal of the 60:40 Policy at the Secondary Schools.

PART B: Implementation of Students' Participation Policy in the field of Science and Technology (S & T) at the Secondary School

PART C: Problems Faced in Implementing the Students' Participation Policy (SPP) in Science & Technology (S & T)

PART D: School Environment and Leadership

## PART A

### Appraisal of the 60:40 POLICY at the Secondary Schools

Instructions:

1. Please read every question carefully.
  2. For each item with an answer bracket, please indicate with a tick (/) for ONE answer only.
  3. Please write your answer when and where required.
- 

1. How long have you been a teacher?

- (a) Less than 5 years ( )
- (b) 5 – 10 years ( )
- (c) More than 10 years ( )

2. How long have you been teaching science/technology subjects?

- (a) Less than 5 years ( )
- (b) 5 – 10 years ( )
- (c) More than 10 years ( )

3. Are you acquainted with the 60:40 policy?

- (a) Yes ( )
- (b) No ( )

**If your answer is “Yes” kindly answer the following questions.**

4. How long have you come to know of this 60:40 policy?

- (a) Less than 5 years ( )
- (b) 5 – 10 years ( )
- (c) More than 10 years ( )

5. The 60:40 policy is aimed to encourage more students to take up science/technology subjects in the secondary schools, do you think this is a feasible?

- (a) Yes ( )
- (b) No ( )

6. Have you been involved in any programme related to the 60:40 policy?

- (a) Yes ( )
- (b) No ( )

7. How have you come to know about the 60:40 policy?

- (a) From the school ( )
- (b) From the press ( )
- (c) From friends/colleagues ( )
- (d) Other ways ( )

8. Do you get excited about this 60:40 policy?

- (a) Yes ( )
- (b) No ( )

9. Do you agree that the teaching of science/technology should be strongly emphasized in the secondary schools?

- (a) Yes ( )
- (b) No ( )

10. Do you agree that the study of science/technology at the secondary schools is crucial for the success of the 60:40 policy?

- (a) Yes ( )
- (b) No ( )

11. How do you feel about making the 60:40 policy coming true?

- (a) Extremely confident ( )
- (b) Very confident ( )
- (c) Confident ( )
- (d) Quite Confident ( )
- (e) Totally Not Confident ( )

12. How do you rate the importance of the 60:40 policy to the success of the country becoming a developed nation in 2020?

- (a) Extremely critical ( )
- (b) Very critical ( )
- (c) Critical ( )
- (d) Quite Critical ( )
- (e) Totally Not Critical ( )

## PART B

### Implementation of Students' Participation Policy in the field of Science and Technology (S & T) at the Secondary School

Instruction: Circle the number according to the degrees as shown below.

1 = Totally Unsatisfactory

2 = Quite Satisfactory

3 = Satisfactory

4 = Good

5 = Excellent

|    |  |   |   |   |   |   |
|----|--|---|---|---|---|---|
| 1  | Allocation of funds by the government for development.   | 1 | 2 | 3 | 4 | 5 |
| 2  | Number of human resource implementing the policy   | 1 | 2 | 3 | 4 | 5 |
| 3  | Quality of the human resource implementing the policy  | 1 | 2 | 3 | 4 | 5 |
| 4  | Increase of knowledge given to the teaching staff in the form of seminars or workshops.                | 1 | 2 | 3 | 4 | 5 |
| 5  | Additional incentives to teachers who teach subjects associated with science and technology.           | 1 | 2 | 3 | 4 | 5 |
| 6  | Ratio of teacher to students in S & T field.   | 1 | 2 | 3 | 4 | 5 |
| 7  | Opportunity for promotion with more attractive incentives when teaching in S& T.                       | 1 | 2 | 3 | 4 | 5 |
| 8  | Availability of suitable infrastructure/atmosphere in order increase students' participation in S & T. | 1 | 2 | 3 | 4 | 5 |
| 9  | Library has adequate materials for knowledge development in S & T.                                     | 1 | 2 | 3 | 4 | 5 |
| 10 | Ratio of computer to students for students' accessibility to information via the internet.             | 1 | 2 | 3 | 4 | 5 |
| 11 | Number of labs and workshops in accordance with S & T field.   | 1 | 2 | 3 | 4 | 5 |
| 12 | Access to the latest textbooks and reference books in S & T.   | 1 | 2 | 3 | 4 | 5 |
| 13 | Access to information related to S & T via information communication technology (ICT).                 | 1 | 2 | 3 | 4 | 5 |

(Adopted from: Sufean & Norliza, 2009, Dasar Modal Insan, 60:40 in Sains & Teknologi, pp. 153-155.)

## PART C

### Problems Faced in Implementing the Students' Participation Policy (SPP) in Science & Technology (S & T)

Instructions:

The statements below represent the problems which may be faced by the implementers in implementing the SPP in S & T. Circle the answer most suitable based on the degrees of criticality below.

1 = Totally Not Critical

2 = Quite Critical

3 = Critical

4 = Very Critical

5 = Extremely Critical

- |  |   |   |   |   |   |
|--|---|---|---|---|---|
| 1. Programmes and activities planned cannot be carried out due to lack of funds for development and management.    | 1 | 2 | 3 | 4 | 5 |
| 2. Programme forecast and evaluation to ensure the implementation of policy as planned.                            | 1 | 2 | 3 | 4 | 5 |
| 3. Implementation of programme/activity not planned by the school but directed by other parties.                   | 1 | 2 | 3 | 4 | 5 |
| 4. Clash of ideas and values between policy maker and implementer causing differences in definition of the policy. | 1 | 2 | 3 | 4 | 5 |
| 5. Unsatisfactory achievement by students in subjects associated with S & T.                                       | 1 | 2 | 3 | 4 | 5 |
| 6. Students' attitude and assumption that S & T is difficult.  | 1 | 2 | 3 | 4 | 5 |
| 7. Students are more interested in social sciences rather than S & T.  | 1 | 2 | 3 | 4 | 5 |
| 8. Students taking S & T have low knowledge and skills in science.   | 1 | 2 | 3 | 4 | 5 |
| 9. Students taking S & T have low literacy in science.   | 1 | 2 | 3 | 4 | 5 |
| 10. Level of students on the whole currently taking up programmes/courses in S & T.                                | 1 | 2 | 3 | 4 | 5 |
| 11. Students' ability to give opinions and presentations on their respective field.                                | 1 | 2 | 3 | 4 | 5 |
| 12. Creativity level of students in S & T.   | 1 | 2 | 3 | 4 | 5 |
| 13. Students do not read beyond what they learnt in class.   | 1 | 2 | 3 | 4 | 5 |

|  |   |   |   |   |   |
|--|---|---|---|---|---|
| 14. The requirements are too high, causing little participation in class.  | 1 | 2 | 3 | 4 | 5 |
| 15. Only academic achievements are used as the criteria for selection of students to enter the S & T field.                  | 1 | 2 | 3 | 4 | 5 |
| 16. No alternative choice of criteria is available to ensure students' personality is suitable with the chosen S & T course. | 1 | 2 | 3 | 4 | 5 |
| 17. Emphasis on student quality is more important than student quality in participating in S & T field.                      | 1 | 2 | 3 | 4 | 5 |
| 18. Special incentives for teachers in the S & T field.  | 1 | 2 | 3 | 4 | 5 |
| 19. Opportunity for promotion for teachers based more on seniority than merit and credibility.                               | 1 | 2 | 3 | 4 | 5 |
| 20. Current number of non-academic staff i.e. lab assistants and support staff to assist the teaching staff.                 | 1 | 2 | 3 | 4 | 5 |
| 21. Allocation of funds is sufficient with the increase of students.   | 1 | 2 | 3 | 4 | 5 |
| 22. Teaching and learning resources and equipment cannot be upgraded due to lack of funds.                                   | 1 | 2 | 3 | 4 | 5 |
| 23. Infrastructure facilities built in according to increase of students each year.  | 1 | 2 | 3 | 4 | 5 |
| 24. ICT facilities on par with current development.  | 1 | 2 | 3 | 4 | 5 |
| 25. Labs for practical training fully equipped with latest hi-tech facilities.   | 1 | 2 | 3 | 4 | 5 |
| 26. School library facilities on par with current development.   | 1 | 2 | 3 | 4 | 5 |

(Source: Adopted from Sufean & Norliza, 2009. Dasar Modal Insan, 60:40 dalam Sains & Teknologi, pp. 156-157.)

## PART D

### School Environment and Leadership

There are 5 sections in this PART.

#### 1. Appraise your school culture

The scales relate to the school culture characteristics.

Put a circle on each scale according to how you rate your own school.

| No | Rate your school culture  | Strongly agree | Agree | Neutral | Disagree | Strongly disagree |
|----|---|----------------|-------|---------|----------|-------------------|
| 1  | I feel comfortable challenging statements made by the Head Teacher (HT)                 | 5              | 4     | 3       | 2        | 1                 |
| 2  | My HT heavily penalizes assignment that are not turned in on time                       | 1              | 2     | 3       | 4        | 5                 |
| 3  | My HT believes that it is the final results that count                                  | 1              | 2     | 3       | 4        | 5                 |
| 4  | My HT is sensitive to my personal needs and problems.                                   | 5              | 4     | 3       | 2        | 1                 |
| 5  | A large portion of my grade depends on how well I work with others in the school        | 5              | 4     | 3       | 2        | 1                 |
| 6  | I often feel nervous and tense when I come to school                                    | 1              | 2     | 3       | 4        | 5                 |
| 7  | My HT seems to prefer stability over change.  | 1              | 2     | 3       | 4        | 5                 |
| 8  | My HT encourages me to develop new and different ideas.                                 | 5              | 4     | 3       | 2        | 1                 |
| 9  | My HT has little tolerance for sloppy thinking.   | 1              | 2     | 3       | 4        | 5                 |
| 10 | My HT is more concerned with how I came to a conclusion than with the conclusion itself | 5              | 4     | 3       | 2        | 1                 |
| 11 | My HT treats all teachers alike.  | 1              | 2     | 3       | 4        | 5                 |
| 12 | My HT frowns on teachers helping each other.  | 1              | 2     | 3       | 4        | 5                 |
| 13 | Aggressive and competitive people have a distinct advantage in this school              | 1              | 2     | 3       | 4        | 5                 |
| 14 | My HT encourages me to see the world differently  | 5              | 4     | 3       | 2        | 1                 |

(Adopted from Robbins, S.P. & Judge, T.A., 2007, *Organisational Behaviour*, 3<sup>rd</sup> edn, pp. 536-537.)

## 2. Appraise Leadership Dimensions

This assessment is designed to determine two important dimensions of leadership and to identify which of these dimensions is more prominent in your supervisor to whom you are accountable, for example the School Principal.

### Instructions

Read each of the statements below and circle the response that you believe best describes your supervisor.

| No. | Leadership Dimensions   | Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|-----|---|-------------------|----------|---------|-------|----------------|
| 1   | Focuses attention on irregularities, mistakes, exceptions and deviations from what is expected of me. | 1                 | 2        | 3       | 4     | 5              |
| 2   | Engages in words and deeds that enhanced their image of competence.                                   | 1                 | 2        | 3       | 4     | 5              |
| 3   | Monitors performance for errors needing correction  | 1                 | 2        | 3       | 4     | 5              |
| 4   | Serves as a role model for me   | 1                 | 2        | 3       | 4     | 5              |
| 5   | Points out what I will receive if I do what is required.  | 1                 | 2        | 3       | 4     | 5              |
| 6   | Instills pride in being associated with them  | 1                 | 2        | 3       | 4     | 5              |
| 7   | Keeps careful track of mistake.   | 1                 | 2        | 3       | 4     | 5              |
| 8   | Can be trusted to keep me overcome any obstacle.  | 1                 | 2        | 3       | 4     | 5              |
| 9   | Tells me what to do to be rewarded for my efforts.  | 1                 | 2        | 3       | 4     | 5              |
| 10  | Makes me aware of strongly held values, ideals and aspirations that are shared in common.             | 1                 | 2        | 3       | 4     | 5              |
| 11  | Is alert for failure to meet standards.   | 1                 | 2        | 3       | 4     | 5              |
| 12  | Mobilizes a collective sense of mission.  | 1                 | 2        | 3       | 4     | 5              |
| 13  | Works out agreements with me on what I will receive if I do what needs to be done.                    | 1                 | 2        | 3       | 4     | 5              |
| 14  | Articulates a vision of future opportunities.   | 1                 | 2        | 3       | 4     | 5              |
| 15  | Talks about special rewards for good work.  | 1                 | 2        | 3       | 4     | 5              |
| 16  | Talks optimistically about the future.  | 1                 | 2        | 3       | 4     | 5              |

(Source: McShane, S. & Travaglione, T. (2005), Organisational Behaviour on the Pacific Rim, Enhanced Edition, McGraw-Hill, Sydney, p. 492.)



### 3. Appraise the magnitude of flexibility

Test yourself by answering “Often”, “Sometimes” or “Rarely” to the following questions.

Put a cross (x) to the answer you have selected.

| No | How flexible are you?  | Frequencies |           |        |
|----|--|-------------|-----------|--------|
|    |  | Often       | Sometimes | Rarely |
| 1  | Do you tend to seek out only those people who agree with your analysis on issues?                          |             |           |        |
| 2  | Do you ignore most of the advice from co-workers or other students about doing your work more efficiently? |             |           |        |
| 3  | Do your team members go along with what you say just to avoid an argument?                                 |             |           |        |
| 4  | Have people referred to you as “rigid” or “close-minded” on several occasions?                             |             |           |        |
| 5  | When presented with a new method do you immediately look for a plan?                                       |             |           |        |
| 6  | Do you make up your mind early with respect to an issue and then hold firmly to your opinion?              |             |           |        |
| 7  | When people disagree with you, do you tend to belittle them or become argumentative?                       |             |           |        |
| 8  | Do you often feel you are the only person in the group who really understands the problem?                 |             |           |        |
| 9  | Do you prefer to hang on to old software even though more than one new update has been published?          |             |           |        |
| 10 | Do you resist trying new ideas?  |             |           |        |

(Source: DuBrin, A.J. (2005), *Fundamentals of Organizational Behaviour*, 3<sup>rd</sup> edn. Thomson, Canada., p.314.)

#### 4. Team Player Attitudes in the School

There are 10 opinion statements in this section. You are required to describe how well you agree with each of the following statements using this scale:

- Disagree Strongly (DS),
- Disagree(D),
- Neutral (N),
- Agree (A), and
- Strongly Agree (SA)

Put a cross to the answer that best describes your agreement to each opinion statement.

| No           |  | DS | D | N | A | SA |
|--------------|--|----|---|---|---|----|
| 1            | I am at my best working alone.   | 5  | 4 | 3 | 2 | 1  |
| 2            | I have belonged to clubs and teams ever since I was a child.                             | 1  | 2 | 3 | 4 | 5  |
| 3            | It takes far too long to get work accomplished with a group.                             | 5  | 4 | 3 | 2 | 1  |
| 4            | I like the friendship of working in a group.   | 1  | 2 | 3 | 4 | 5  |
| 5            | I would prefer to run a one person show than to be a member of a large group assignment. | 5  | 4 | 3 | 2 | 1  |
| 6            | It's difficult to trust others in the group on key assignments.                          | 5  | 4 | 3 | 2 | 1  |
| 7            | Encouraging others comes naturally to me.  | 1  | 2 | 3 | 4 | 5  |
| 8            | I like the give and take of ideas that is possible in a group.                           | 1  | 2 | 3 | 4 | 5  |
| 9            | It is fun for me to share responsibility with other group members.                       | 1  | 2 | 3 | 4 | 5  |
| 10           | Much more can be accomplished by a team than by the same member of people working alone. | 1  | 2 | 3 | 4 | 5  |
| Total Score: |  |    |   |   |   |    |

(DuBrin, 2005, p.214)

#### 5. Factors Perceived as Supporting Teachers

Please put a cross 'X' in the box next to each statement or question which best represents your opinion, according to the "yes" or "no" column. (There are altogether 34 opinions.)

|   | Factors  | Yes | No |
|---|--|-----|----|
| 1 | The School Principal provides opportunities for science teachers to:   |     |    |
|   | (a) share values and aims relating to the teaching and learning of science in the school.  |     |    |
|   | (b) create and innovate and to lead.   |     |    |
|   | (c) interact with each other.  |     |    |
| 2 | (d) take risks and experiment.   |     |    |
|   | The School Principal shares his/her vision among teachers:   |     |    |
|   | (a) Getting science teachers to be involved in decision-making.  |     |    |
|   | (b) Ensuring science teachers collectively responsible to the success of the said policy   |     |    |
|   | (c) Allowing science teachers to play the leadership role during discussions and group meetings of matters relating to teaching and learning of science subjects |     |    |
|   | (d) Consulting with teachers.  |     |    |

|   |   |  |  |
|---|---|--|--|
| 3 | The School Principal develops trust to prevail among the teachers:  |  |  |
|   | (a) Empower science teachers to make decisions in their areas of expertise.   |  |  |
|   | (b) Encouraging science teachers to work in teams on school projects, school activities or field works.   |  |  |
|   | (c) Providing clear leadership roles among the teachers.  |  |  |
| 4 | (d) Giving training on team building among science teachers.  |  |  |
|   | The encouragement for establishing cross-subject teams to break down subject barriers and boundaries among science teachers and other teachers in the school: |  |  |
|   | (a) Do you feel happy?  |  |  |
|   | (b) Do you feel self confident?   |  |  |
|   | (c) Do you feel as part of a team?  |  |  |
|   | (d) Do you feel you get support from other members?   |  |  |
|   | (e) Do you feel there is better understanding?  |  |  |
|   | (f) Do you feel you are co-owners of decisions made?  |  |  |
|   | (g) Do you feel being involved in decision making?  |  |  |
|   | (h) Do you feel you are now more responsible?   |  |  |
| 5 | (i) Could you like to do the same thing again?  |  |  |
|   | (j) Do you feel your ideas being appreciated?   |  |  |
|   | Support and specific forms of professional development of science teachers:   |  |  |
|   | (a) Send teachers for specific courses like leadership & curriculum development.  |  |  |
|   | (b) Conduct in-house teaching and development programmes.   |  |  |
|   | (c) Introduce new monitoring & coaching programmes to develop leadership skills.  |  |  |
| 6 | (d) Provide external support such as collaboration net work opportunities.  |  |  |
|   | (e) Give recognition and rewards for good performance and achievement.  |  |  |
|   | Parental Supports:  |  |  |
|   | (a) Do parents support the school and their children's education?   |  |  |
| 7 | (b) Do parents see the role of schools as the provider of education to their children and therefore do not get involve in their children's education?         |  |  |
|   | (c) Do parents actively participate in school activities such as parent-teachers meetings, sports day and other functions organized by the school?            |  |  |
|   | Supports from the education departments and the Ministry of Education:  |  |  |
|   | (a) The school has the necessary facilities like science laboratories and instruments and equipments for the teaching of science subjects.                    |  |  |
|   | (b) There are adequate numbers of trained science teachers to meet the needs of the school.   |  |  |
|   | (c) Modern teaching audio-visual aids like projectors and computers and teaching programmes are available and in operating conditions all the time.           |  |  |
|   | (d) Requests for replenishment of supplies for laboratory lessons are not delayed.  |  |  |

#### Sources:

- (1) Sufean Hussin & Norliza Zakuan (2009). *Dasar Modal Insan 60:40 Dalam Sains dan Teknologi*, pp.148-158.
- (2) Robbins, S.P. & Judge, T.A. (2007). *Organisational Behaviour*, 3<sup>rd</sup> edn, pp. 536-537.
- (3) McShane, S. & Travaglione, T. (2005). *Organisational Behaviour on the Pacific Rim*, Enhanced Edition, p.492.
- (4) DuBrin, A.J. (2005), *Fundamentals of Organisational Behaviour*, 3<sup>rd</sup> edn., p. 214.
- (5) Bell, F. H. (1978). *Teaching and Learning of Mathematics in Secondary School*, pp. 378-444.
- (6) Victor, E. & Lerner, M.S. (1975). *Readings in Science Education for the Elementary School*, pp. 286-289 & 367.