RESEARCH, DEVELOPMENT AND DIFFUSION AND SOCIAL INTERACTION MODELS

By: **Tatang Muttaqin**

Kementerian Perencanaan Pembangunan Nasional/
Badan Perencanaan Pembangunan Nasional (BAPPENAS)
Jalan Taman Suropati No.2 Jakarta 10310, DKI Jakarta, Indonesia

Email: tatangmutaqin@gmail.com

Abstraction

The role of education in developing oneself as human resource has been discussed extensively by Fullan (1982) as a general objective of education, which includes the cognitive aspect comprising academic skills (reading and mathematics) and at a higher level of thinking skills (ability in problem solving). Furthermore, according to Fullan, education simultaneously includes the development of personal and social aspects, which enable a person to work and live in a group creatively, with initiatives, empathy and possess adequate interpersonal skills to live in society.

I. Introduction

Education is essential and has become one of the most important elements in one's life. Discussion on education matters is not easy because of its nature, which is complex, dynamic and contextual. Education is the arena for the formation of a human being as a whole. The role of education in developing oneself as human resource has been discussed extensively by Fullan (1982) as a general objective of education, which includes the cognitive aspect comprising academic skills (reading and mathematics) and at a higher level of thinking skills (ability in problem solving). Furthermore, according to Fullan, education simultaneously includes the development of personal and social aspects, which enable a person to work and live in a group creatively, with initiatives, empathy and possess adequate interpersonal skills to live in society.

As a dynamic area, there are so many possible innovations in education particularly in attempting to achieve the educational objectives already mentioned. According to Webster's New World Dictionary (1971), "Innovation is something newly introduced; a new method, practice, device, etc." As a new something, it is still strange and uncommon for people so it needs to be disseminated to users. This is a broad wide explanation of describing innovation. In attempting to formulate and simplify the explanation, we need models.

This paper is intended to explain and compare two kinds of educational innovation models: 1)

the Research, Development and Diffusion Model; and 2) the Social Interaction Model.

II. Research, Development And Diffusion And Social Interaction Models

2.1 Assumptions Underpinning the RD & D Model

The Research Development and Diffusion Model (RD&D Model) is a linear and systematic model in disseminating innovation from the center to the periphery. It has three stages: 1) research; 2) development; 3) diffusion. It creates awareness about the programs, and then disseminates the innovation program so that innovation can be replicated and used in other areas. (Havelock, 1971; Eden & Tamir, 1979; Snyder et al., 1992; Common & Egan, 1988).

In the RD & D Model, initiative comes from center, and then center disseminates the innovation to users. They consume all innovation materials without any involvement in designing. In this model, the teachers are passive as consumers, Wagner (1993) described more often teachers view them as capricious or illogical when the changes are not explicitly linked to new goals and strategies.

The RD&D Model is the most systematic categorization of processes related to educational innovation. Eden & Tamir (1979) contended that it contains at least four assumptions:

1. Rational sequence It assumes that there should be order in a rational sequence in the evolution and application of innovation. This sequence starts from enquiry and analyzes the model by research, then develops the model including testing to provides evidence that the innovation was effective with students and could be adopted effectively in another setting. After the innovation program is finalized, then comes packaging and finally dissemination such as government regulations, teaching guides books, in service training, or mass medium dissemination so it spreads to users massively.

2. Planning The RD & D Model is done on a big and massive scale or nationally so it needs a long time to design, implement, and evaluate. For those reasons there has to be planning.

3. Division labor, A big project will need many people and labor in many job descriptions. It is difficult for just one individual, therefore duties have to be divided and coordinated to accord with the rational and planning.

4. Passive users It assumes that the users are more or less passive. So the dissemination process should be designed and done effectively. Consequently, innovation has to be packaged and offered in the right place at the right time and in the right form, something rational consumer can accept smoothly.

Havelock (1971) proposed the fifth assumption, High Cost, as a consequence of big and massive project in a long-term implementation. The RD & D model needs many resources especially in budget expenditure. Therefore, proponent of this model will accept high costs prior to any dissemination activity because of the anticipated long-term benefits in the efficiency and quality of the innovation and its suitability for mass audience dissemination.

Those assumptions are stepping-stones for analyzing and attempting to implement innovations. Concretely, innovations are designed by special plans, arranged movement from research, development, and diffusion, which is done by different people in different divisions, and then spread to audiences as users directly and massively. This model usually is used in a centralistic state system, for example in Indonesia.

2.2 Strategies Underpinning the RD & D Model

According to Dalin's classification (1974), there are three strategies: empirical-rational, normative-re-educative, and power-coercive (politicaladministrative). Thus, the RD & D Model tends to use the empirical-rational strategy in research and development stages, but in diffusion stage suits with the powercoercive strategy which emphasizes political, legal, and economical power in achieving its objectives. In diffusion stage, it suits in the center-periphery approach by using levels of bureaucracy directly and authoritarian leadership.

2.3 Assumptions Underpinning the Social Interaction

Model The Social Interaction Model is based on teacher initiative in disseminating innovation from periphery to periphery through the social system. Even though, prior initiative in innovation designing come from the center, which introduces the guidelines of new curriculum, selects and organizes characteristic samples. (Havelock, 1971 ; Eden & Tamir, 1979).

The main role of the teachers is the translation of new curriculum ideas into local and class contexts. The center believes that the teachers are professional and creative persons so gives chances and freedom to teachers in implementing a new curriculum as well as local context and local condition. (Eden & Tamir, 1979; Wagner,1993; Brand, 1997; Trubowitz, 2000).

According to Havelock (1971), the Social Interaction Model tends to support five generalizations about the process of innovation diffusion:

1. The network of social relations has a large role-play in the diffusion innovation. In communal society, reference group or network of social relation social has a big influence on individual attitudes (Hargreaves, 1975).

As a consequence the adoption process will refer to social relations. Concretely, person in society will accept or reject the innovation depending on social relations.

2. The rate of acceptance can be predicted by social reference. It happens as a consequence of the first assumption, which area such as centrality, peripheral, and isolation area become good predictors in the rate of acceptance so we can forecast the rate according to the area in which people live.

3. Personal contact is a vital part of the influence and adoption process. Informal and personal contacts influence media in the socialization process. As a result, informal and personal contacts become a vital part in the adoption process.

4. Group memberships are major predictors of individual adoption. It happens as a consequence of the group membership and reference group identifications, which persons will refer to all life aspects as a social norm for harmony.

5. Multilevel effect. It happens as a result of the social interaction process, where so many people disseminate an innovation from person to person simultaneously in the social system so the diffusion process will advance rapidly following use.

2.4 Strategies Underpinning the Social Interaction Model

The Social Interaction Model tends to use normative-re-educative strategy which emphasizes the involvement of the client in the innovation so the change agent must learn to operate jointly with the client in order to solve the client's problems. Dalin (1988) stated that the normative-re-educative strategy based on an idealistic understanding of human beings and an optimistic assumption of the possibilities for

meaningful changes initiated by the individual and through the individual. As a result, the Social Interaction Model which uses the normative-re-educative strategy does not only supply the appropriate technical information, but also changes attitudes, skills, values and relationship.

2.5 Adaptation Perspectives

Adaptation is one stage of implementation which it modifies and adjusts the innovation to the local needs and local context. (Eden & Tamir, 1979; Fullan, 1991). Accordingly, implementation of innovation needs adjustment process in facing the reality. Then, what kinds of approach are there in adjusting innovation implementation? Snyder et al. (1992) contend there are three approaches in curriculum implementation:

1. Fidelity perspective In the Fidelity perspective, implementation must be the same as originally planned so successful implementation by users or teachers implementing the curriculum is directed precisely.
2. Mutual adaptation perspective In the Mutual adaptation perspective, implementation can adjust and compromise with the school and classroom context so there are flexibility and mutual negotiation in carrying out curriculum as demanded by local contexts and school needs directed by the designer.
3. Curriculum enactment perspective, In the Curriculum enactment perspective, curriculum is viewed as educational experiences even though there are curriculum materials from designers, they are just instruments and tools for students and teachers to enact the curriculum jointly in classrooms. Concretely, students and teachers are centers in enacting and implementing curriculum.

By using three Snyder perspectives, the RD & D Model suits with Fidelity perspective, which has linear models and lack of distortion. Gray (1983) stated that to close the implementation gap and secure the highest possible return on investments in innovation, explicit procedures are needed to guide implementation and facilitate utilization. As a result, in the RD & D Model, there are so many guidelines for implementation because it is very useful to achieve the targets and objectives of new innovation. For example, in Indonesia, even curriculum revision takes place every ten years, but the new guidelines for implementation are made every two or three years because the center worries about inaccurate implementation.

On the other hand, the Social Interaction Models tends toward Mutual Adaptation perspective, which gives a chance to users to modify the innovations referred to local demands so the new curriculum is suitable and comfortable with different conditions and different needs. As a result, there are negotiation processes and give and take processes in implementing innovation. For example, implementing Local Content Curriculum (LCC) program.

According to real conditions in the schools, particularly in periphery areas, the teachers can teach the skill subject to suit local conditions and according to the availability of resources. Accordingly, the skill-art subject in one school will be different from another school because the subject refers to the local environment and local market needs. As a result, the students have special skill-art which are marketable and suitable for local conditions. Berman and Mac Laughlin (1976) stated that effectively implemented innovations are characteristic by Mutual adaptation.

2.6 A Comparison between the RD & D and the Social Interaction

According to the assumptions mentioned above, the differences between the RD & D Model and the Social Interaction Model are:

1. Stage of communication The RD & D Model uses linear communication (one stage communication), which innovation disseminates directly from the central government to the users by issuing ministry regulations and guidelines for implementation. For example, innovation in curriculum is called Curriculum Based on Competence (CBC). The Ministry of National Education (MONE) designs this program by research and development, and then it spreads directly to the users. The MONE prints and issues all materials, then distributes them to schools from primary to senior high school levels. In schools, the headmaster distributes them to the teachers as users. Besides distribution to schools, the materials are sent to district governments for school supervisors. There is no communication and interaction between the teachers as the users and the MONE as the designer and producer. The teachers just read and teach following instructions in the guidelines implementation without comments or feedback. In contrast, in the Social Interaction Model, even though the central government designed materials, are the same as the RD & D Model, but when the materials are distributed, there are many stages of communication. For example, Local Content Curriculum (LCC or Muatan Lokal), the Curriculum Center of the MONE designs material about LCC including the best sample of local content. After the materials are already, the MONE invites teachers as representatives from all districts (local governments) to participate in LCC Workshop. After the workshops, representatives return to their respective districts, and discuss with other teachers in teacher work groups (Kelompok Kerja Guru or KKG). Besides discussion, the representatives demonstrate their new knowledge and skills about LCC. Some teachers are interested to learn about LCC, and then teachers who accept this new curriculum will discuss with other teachers, and finally followers will discuss again with colleagues.

2. Time taken and forecasting to complete The spread of innovation in the RD & D Model is faster than in the Social Interaction Model because since the beginning of innovation spread in the RD & D Model is quick, but the initial spread of innovation in the Social Interaction Model is slow. Referring to the CBC case, the materials are distributed to the school and local government directly so after one or two months, all materials are accepted, and then users can use them. Besides being quicked, we can forecast the completion of distribution. In contrast, in the LCC case, after the teacher

3. representatives participated in the workshop, and then go back to their schools, even if they socialize directly, they need times to distribute LCC to other teachers and it is impossible to forecast when socialization will be completed.

4. Costing and budgeting The RD & D Model is expensive because it needs a budget for printing materials, distributing the packages, training supervisors, and paying manpower salaries, renting equipment and tools, and then the mass media is used for socializing the program is required extra budget for socializing on a big scale. However, the Social Interaction Model is cheaper than in the RD & D Model. In the LCC case, the MONE just spends a budget for one workshop and supporting materials on a small scale and uses a limited time so the needs are the same, but the scale is smaller.

5. User attitude In the RD & D Model, users are

passive because they just accept materials and do not have a chance to comment or give feed back. In the CBC case, the teachers accept materials and implement rigidly the guidelines on implementation. As a result, the RD & D Model tends to make teachers become passive but the Social Interaction Model tends to make the teacher representatives become active to disseminate and discuss the LCC.

6. Information distorting In the CBC case, one teacher in a different place will accept the innovation content in the same way as another teacher because all teachers refer to the same material. On the contrary, in the LCC case, teacher representatives from several districts will discuss the LCC concept and its advantages in different ways and refer to their understanding, knowledge, experience, and the local context. If in every communication step, there is any distortion, it is possible distortion of information will be greater for the last followers.

In addition, the differences between the RD & D Model and the Social Interaction Model can refer to the strategy used by the models. By using Dalin's classification (1974), there are three strategies: 1) empirical-rational; 2) normative-reeducative; and 3) power-coercive (political-administrative).

The RD & D Model suits to use the power-coercive strategy by using political, administrative, legal and economic powers in achieving his objectives. For

Example, in my country, there is an institution which has responsibility in designing ideological programs by research and development in the center. The result of research is developed and disseminated massively and directly.

The MONE as part of government institution directs all students from primary school until university to learn state ideology called Pedoman Penghayatan dan Pengamalan Pancasila (P4). It is a part of the national curriculum. As a result, education system becomes political instrument to internalize the state ideology.

Besides political support, the government uses legal power to support the state ideology program. As a result, many people and activists who reject this program become prisoners because they are suspected of going against the law and government regulations. To support this program, the government holds administration tests, which all government officers must attend and be cleared for ideological loyalty. As a consequence, government officers who fail this test are terminated from jobs and positions.

The government supports this program by using economic power. Every business regulation always refers to administration and ideology clarification so people who are suspected of being against state ideology will find difficulties in their business and economic policy. The new order attempted, by using political, administrative, legal and economic power to implement the state ideology program in my country, but was unsuccessful and has cancelled the program.

On the other hand, the Social Interaction Model suits normative-re-educative strategy. For instance, the Local Content Curriculum (LCC) case. After participating in national workshop, teacher representatives will implement new knowledge. Besides they will involve in social activities, and then they discuss collaboratively with the other teachers in order to solve their problem. In this process, both the representative and their colleagues will have initiative and becomes active to implement the innovation.

Accordingly, the implementation process occurs smoothly by using consensus approach and avoids conflict approach. The teachers, students,

and parents will involve actively. As a result, the Social Interaction Model is able to adjust with the local and individual context. Brandt (1997) stated that education officials and policy

makers will need to negotiate with parents and voters which issues are settled in which ways. "... there will be teaching and learning in some kind of suitable setting".

III. CONCLUSION

As alternatives, all innovation models are useful depending on the area of implementation. It should be realized that not every model is the answer to all problems of innovation, but it is, at least, an answer for guideline and reference. According to Fullan (1982), education simultaneously includes development of personal and social aspects, which enables a person to work and live in a group creatively, with initiatives, empathy and possessing adequate interpersonal skills to live in society so the product of an innovation in education is change behavior as whole human being so the teacher and the student are a center of education process. For that reason, the teacher must be active, show initiative, be creative, and have adequate interpersonal skills to assist the students to become human being as a whole. It is impossible to develop this in the RD & D Model. In conclusion, the Social Interaction Model is suitable and more comfortable for the education field than the RD & D Model.

References

Berman, P., & Mclaughlin, M.W., Implementation of Educational Innovation, in The Educational Forum, (1976), P.345-370.

Brandt, Ron, "Public Education in the 21st Century", in International Electronic Journal for Leadership in Learning, Vol. 1 No. (1), March, (1997).

Common, D. & Egan, K., "The Missing Soul Models of Curriculum Implementation – Educational Theory", in Curriculum Perspective. 8 (1), 1 – 10.

Dalin, Per, Case Studies in Educational Innovation: IV, Paris: OECD/CERI, (1974), pp. 131-135.

Fullan, M.G., The Future Educational Change, Ontario: OISE Press, (1982), pp.288297.

Fullan, M.G., The New Meaning of Educational Change, New York, College Press, Columbia University, (1991), pp.17-100.

Guralnik, D.B. (Ed.), Webster's New World Dictionary of The American Language Second Edition, New York: Avenel Books, (1978).

Hargreaves, David H., Interpersonal Relations and Education: Student Edition, London: Routledge & Kegan, (1975), p. 13.

Jackson, P.W., "John Dewey's 'School and Society' Revisited", in the Elementary School Journal, Vol. 98 No. (5), University of Chicago: May, (1998), p. 415.

Leithwood, K.A. and Montgomery, D.J., "A Framework for Planned Educational Change: Application to the Assessment of Program Implementation", Educational Evaluation and Policy Analysis, Vol. 4 No. (2), (1982), p.157.

Rice, Ronald E. and Rogers, Everett M., "Reinvention in the Innovation Process", in Knowledge: Creation, Diffusion, Utilization, Vol. 1 No. (4), Sage Publications (June 1980), p. 502.

Roberts-Gray, Cynthia and Gray, Thomas, "Implementing Innovation", in Knowledge: Creation, Diffusion, Utilization, Vol. 5 No. (2), Sage Publications, December, (1983), p. 215.

Rogers, Everett M., Diffusion of Innovations: Third Ed., New York: The Free Press, (1983), pp. 15-16.

Snyder, Jon, Bolin, Frances and Zumwalt, Karen, "Curriculum Implementation", in Jackson, PW (ed.) Handbook of Research on Curriculum, New York: MacMillan, (1992), pp. 404-418.

Trubowitz, Sidney, "Predictable Problems in Achieving Large-Scale Change", in Phi Delta Kappan Vol. 82 No. (1), October, (2000), p.166.

Wagner, Tony, "Systemic Change: Rethinking the Purpose of School", in Educational Leadership, Vol. 51 No. (1), September, (1993).