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ABSTRACT

This paper examines systematic policy formulation as it contributes to the strategic planning process for school technology. Policy affecting school technology exists at three distinct levels that correspond with the three general governmental levels: federal, state, and local. The Policy Formulation Model is a process that can be used to guide policy formation. Central to the process are the goals--the guiding force or the focus of the entire process. Circumscribing the process is evaluation. The following six elements surround the goals and may be accomplished in any order: (1) Articulate Policy; (2) Collect Data; (3) Determine Guidance; (4) Identify Resources; (5) Prioritize Options; and (6) Develop Policy. Evaluation is continuous throughout the process. (AEF)

Creating Technology Policy: A Systematic Model

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Policy making involves guiding decision making over long time periods and wide areas of interest for leaders and resource managers. First (1992) ascribes three focused characteristics to policy making: functioning from a strategic perspective, providing developmental guidance and clarification for major objectives, and furnishing priorities for resource allocation.

Policy, then, provides the steering mechanism that enables planning to take place. It is a first step in the planning process that enables the establishment, clarification, and prioritization of strategic goals and objectives. The tests of successful policy are an examination of the program accomplishments to determine whether the intended beneficiaries are truly profiting from the initiative and a judgment about the fairness of the policy to all constituencies. This paper will examine systematic policy formulation as it contributes to the strategic planning process for school technology.

Levels of School Technology Policy

Policy affecting school technology exists at three distinct levels that correspond with the three general governmental levels: federal, state, and local. It is not by accident that these levels exist. These levels represent the three hierarchical units that exhibit fiscal control over the schools, since one of the primary characteristics that determines policy is resource allocation. The entity controlling the resources frequently sets policies concerning use of the funds.

Federal policies that affect local technology policies are typically global in scope and funded above local levels, if they are funded at all. They are frequently promulgated by public laws or the resulting interpretation and implementation of these laws. A current example of this is the challenge for this nation "to connect every classroom in America to the information superhighway with computers and good software and well-trained teachers" (State of the Union Message, Jan 23, 1996). The President and Congress provided further policy guidance in this area with the passage of the Telecommunications Act of 1996 (McDonald, 1996).

State policies tend to be more focused on practical and specific issues. Legislatures play a major role at this level, although governors may wield some influence, as has been the case with Governor Zell Miller in Georgia. His policy on the use of lottery proceeds to fund instructional technology throughout the state has been uniquely applied because it must be used to fund "new" programs (Tucker, 1992). Of the thirty-six states and the District of Columbia that have established lotteries as a means of raising funds (Keating, 1996), Georgia's policy stands out as the one that has not offset funds in the general revenue stream (Allen, 1991; Jones, 1994; Jones & Amalfitano, 1994). These funds have provided a realistically funded mandate to local policy planners.

Local policies reflect the cumulative effect of federal and state policies, but have a unique local flavor added to this level. That is because policy reflects the community values and needs and each community makeup is different. Technology policy in the Silicon Valley of California is much different than that of rural southeast Georgia. Employers require different skills and competencies and the general community expectation is different. School technology policy, then, is framed by these three very different influences. Given the competing nature of the policy influences and the fact that budgeting is usually a zero sum game, how does one form a rational technology policy?

A Systematic Approach To Policy Formulation

Policy does not appear. It must be formed and nurtured past many gray areas and hidden obstacles before a policy can be implemented. A systematic approach to policy formulation will enable policymakers to establish realistic policies in reasonable time frames. The Policy Formulation Model in Figure 1 is a process that can be used to guide policy formulation. Central to the process is the goal. The goal is the guiding force — the focus of the entire process. Circumscribing the entire process is evaluation. The evaluation element enables the process to continually be checked for adherence to the stated goals and objectives, which should reflect l... at all three levels. In addition, the goals and objectives are continually subjected to the scrutiny of objective reality. This provides realism for the process.

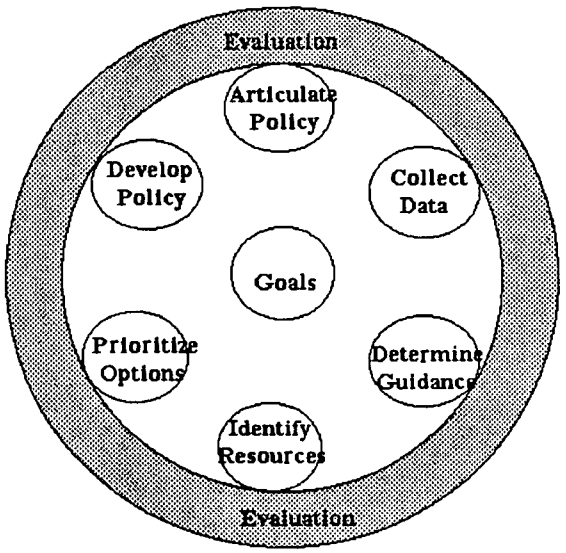

Figure 1. The Policy Formulation Model.

The six elements that ring the goals may be accomplished in any order. This nonlinear approach allows accomplishment of these elements to be determined by the application context or the particular local situation. It should be recognized that very frequently, these elements are accomplished in more-or-less sequential fashion, beginning with either "Collect Data" or "Articulate Policy."

Beginning at "Articulate Policy" recognizes that policy formulation is a never-ending, circular process. Policy formulation may begin after a pseudo-policy is formed. Data are then collected and the rest of the systematic elements performed in order to verify the original policy formulation idea. Alternately, an existing policy may be examined to confirm that it continues to meet the tests of a successful policy. Current policy can be subject to the scrutiny that the systematic policy formulation process brings. In this manner, the process can be thought of as an evaluation process, either formative or summative.

Beginning at "Collect Data" recognizes that as one begins to formulate policy, one must gather as much data as possible about a circumstance prior to looking at policy alternatives. In this form, there are far fewer preconceptions about what the policy should be, therefore fewer alternatives to discount.

Goals

The goal of the policy can be determined from sources both internal and external to the system. External sources may be superordinate legislative or administrative bodies, state or federal governments or agencies, certifying bodies or professional organizations, or community associations. Goals can be specific or philosophical, for example, "Students will take 2 years of a foreign language in order to graduate with a college preparatory diploma," or "Students will graduate prepared to meet the challenges of the 21st Century." Internal sources are likely to be the stakeholders — the administration, teachers, and students. These stakeholders may raise an issue that they feel should be focused on, such as "Students should graduate from secondary school with better research skills." These goals are set up as a "strawman" to be verified, better articulated, and enhanced, or through the policymaking process, they will be modified or discarded.

Collecting Data

One must first of all decide upon the kind of data that must be collected and the motivation behind the data collection effort. Data are collected for two general reasons. The first is to articulate or validate the goals that drive the entire process. These data could be "hard" or factual, but are more likely to be opinions. The difference is an important one for policymakers to recognize. Factual data can be verified by sources independent of one individual or group. For instance, the statement, "The students at Wayland Elementary School do not have enough access to technology," may or may not be supported by the fact that in each classroom there are 5 multimedia computers hooked up to the internet, a TV with satellite feed, a videodisc, and a VCR, with access to 125 different software titles and 100 videotapes in the media center.

The second general reason for data collection is to specify the target state and the current state. The target state attempts to identify the situation that must be attained while the current state represents the existing situation. These states are sometimes called "what should be" and "what is." This type of data is more likely to be factual than the preceding type. Using the technology example again, one may collect data on required technology and also existing technology.

Data collection of factual information may be accomplished through existing (sometimes called archival) records, observations (depending on the characteristic observed), and tests; opinions may be accomplished through interviews, focus groups, questionnaires (surveys), or community forums. Factual information is most likely to be collected using quantitative data collection techniques, while opinions are most likely to be acquired through qualitative data collection techniques. Numerous books are written about data collection. For this discussion, it is sufficient to say that after data are collected, the goals can be verified and refined providing the policymaker with a stronger basis for understanding what the target state should be and the current state is.

Supporting the general goal of "schoolwide technological literacy," the policymakers may collect data on the target state. They may research existing law and higher level policy to discover current guidance. They may send out questionnaires to similar schools throughout the state, region, and nation to find out what motivated the existing policies and

the strength of the feelings for those policies. They may conduct interviews with specific individuals who have special expertise in the area or whose opinion would be particularly helpful in the situation. They may conduct focus group studies to find out opinions of teachers, students, or other affected groups. They may conduct community forums to find the community feelings.

Determining the current state is frequently easier, because one is trying to find "what is" instead of "what ought to be." To do this, one must simply go on a fact-finding trip — in fact, much of the data can be collected concurrently with the target state data. This data is dominated by factual data. Examples of the data and collection techniques may be:

- research of existing measures of accomplishment, such as standardized test scores, attendance, or discipline incidents.
- surveys of the stakeholders (teachers, students) to determine current level of accomplishment or they may conduct a focus group to try to get the same type of information.
- interviews of other stakeholders (principals, curriculum specialists, media specialists) to determine their perceptions.
- observations of the use of technology in the educational process.
- looking at existing records, such as equipment and facilities' records.

Determine Guidance Needed

Once the data have been collected, the policymaker must then compare the data concerning the current state to that of the target state. This may be a straightforward, simple task as may occur when a new goal has been added to an organization's mission. It also may be complex, with many interacting components. The policymaker in this instance must organize the data in such a way that the differences between the current and target states are identifiable.

One aid in the accomplishment of that complex task is to build a table (Table 1). List in the columns the state and in the rows the characteristic. A helpful tool to use for determining the characteristics is the concept map (Figure 2). The policymaker must list and relate the essential characteristics of the goal. Once the characteristics have been described concerning current and target state, the gap should become apparent and the policy need established.

Identify Resources

Resources and the correlated constraints should have already been identified during the data collection phase. It is helpful to list these as we begin to solve the problem being researched. In that way, it is easier to realize where our strengths and weaknesses are. It is helpful to look at these from a positive aspect — "What can I do to maximize the potential strengths?" One must avoid the tendency to dwell on the constraints. However, these constraints may point to the need for a policy. Examples of resources may include time, funds, personnel, equipment, facilities, space, materials, group identification, philosophy, and organization. From this list, one can identify areas where solutions may evolve and areas that may be in need of further research and problem solving.

Table 1.
Needs Resolution Format.

	Target State	Current State
Budget		
Resources		
Training		
Access		
Support		

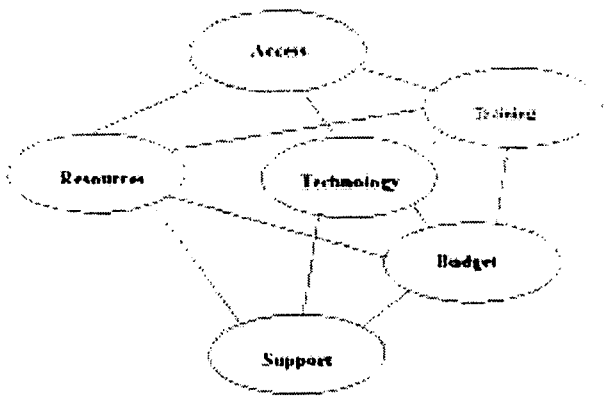

Figure 2. Concept Map.

Prioritize Options

It is not unusual for the policymaker, especially when working with many goals, to identify the need for several policies in numerous areas. The process for arriving at the needed policy is one of brainstorming solutions and prioritizing the possibilities. Brainstorming solutions is a technique familiar to many planners (Jonassen, Hannum, & Tessemer, 1989). It involves systematically generating lists of possible solutions. These possible solutions are not initially judged on their merit. Their value is to provide an exhaustive list of possibilities and to generate other solutions. The method for building the list is not important. It may be generated on butcher paper in a community forum or through the electronic equivalent, a user group.

Once the list of alternatives is generated, then the list must be prioritized according to some criteria. Frequently the criteria are established when the goals are generated. If not, the criteria must be established before the prioritization can occur. Criteria may include:

Size — biggest gaps or the largest policy needs

Importance — the most critical gaps or policy needs

Number of persons directly affected — the policy needs of the largest audience
Risk — the policy needs that carry the greatest negative consequences if they are not performed
Feasibility — policy needs that have the highest probability of being successfully accomplished
Cost — the lowest cost policy needs
Political reality — the policy needs of the most powerful or most vocal group

Methodologies for arriving at prioritization include various types of Delphi techniques, card sorts, Q-sorts, nominal groups, and storyboarding (Murray-Hicks, 1981; Scott & Deadrick, 1982; Witkin, 1984).

Develop Policy

This step is actually selecting from a list of options prioritized according to some criteria and preparing to implement the policy. Solutions to policy needs have been systematically discerned and prioritized according to various criteria. These solutions may be chosen from one or a combination of the criteria. An easy way to combine the various criteria is to construct a matrix (Table 2). That matrix may be filled in with simple numerical data (ranking or rating on criteria 1, criteria 2, etc.) and then the overall ranking determined numerically. There are various other analytical approaches to determining the choice of solution such as the Paired-Weighting Procedure (Wickens, 1980) and Force-Field Analysis (Lewin, 1947).

Table 2.
Prioritization Format.

	Criteria 1	2	3	4	5
Total					
Solution 1					
Solution 2					
Solution 3					
Solution 4					
Solution 5					

Yet, a policy is more than just a prioritized list. It must be workable and it must solve the problem that was identified. Therefore, before any solution is chosen, it should be reexamined in light of those criteria. Workable includes being supportable by the stakeholders that are affected by the policy. Meeting this criterion can be aided by the policymaker's actions throughout the policy analysis process. If stakeholders are kept informed and their concerns are faithfully considered during the analysis, they are more likely to support the policy. Of course, any solution that does not solve the identified problem should be rejected.

Evaluation

Evaluation by its very nature takes on two forms — assessment of how well the policy development process worked and determining if the policy fulfills the goal. Evaluators use the terms formative and summative evaluations for these two processes.

The policy formulation process is by its very nature continuously subject to the formative evaluation process, if properly conceptualized. The circularity of the process requires that each element of the process be examined for consistency and relevance. One may see that if the process depicted in Figure 1 is completed at "Articulate Policy," it leads back into another cycle of data collection, identification of resources, etc. The reason that the evaluation ring surrounds the entire policy formulation is due to the circularity of the process. It also serves as a reminder for policy formers to continuously evaluate each element in the process. Experts in research design should review data collection. Likewise, each element should be reviewed for adequacy. Experts from within the system are recommended and most usually chosen because the nature of the evaluation subjects the evaluator to low amounts of bias risk (Worthen, Sanders, & Fitzpatrick, 1997).

On the other hand, summative evaluators normally should be chosen from outside the system implementing the policy (Worthen, Sanders, & Fitzpatrick, 1997). Bias risks mount when evaluators from within a system are asked to recommend an adoption or continuance decision. That does not mean that there is no risk of bias from an external evaluator, but that the risk is lessened. This evaluator looks to make a decision based on whether the policy fulfills the policy goals, what are its strengths, what problems were encountered, and what results were unexpected. Ultimately, the summative evaluator must decide if the process would be used again and what changes should be made if it is used.

Summary

The policy formulation process model (Figure 2) contains eight elements. The model is focused on the policy goal. Six major policy formulation steps may be accomplished in any order because of the circularity of the process. Evaluation is continuous throughout the process.

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