Chapter 5
Designing the Policy Analysis Process

Pieter W. G. Bots

5.1 Introduction

The literature on policy analysis contains few references to design. In fact, the word "design" is notably missing in the index of prominent textbooks on policy analysis (Dunn 1994; Miser and Quade 1985, 1988; MacRae and Whittington 1997; Nagel 1988; Roe 1994; Wildavsky 1987). Bardach (2000, p. 17) and Patton and Sawicki (1986, p. 177) use the term to refer to the design of alternative strategies or solutions as an important phase or activity in a policy analysis. Although the title of their book *Policy Analysis by Design* suggests otherwise, Bobrow and Dryzek (1987, pp. 18–21) speak only of "policy design", which is not the same as the design of a policy *analysis*, because a policy and a policy analysis are two different artifacts. Apparently, although policy analyses are acknowledged to contain design activities, a policy analysis as a whole is not conceived of as something that can be designed.

For most authors, policy analysis is an approach—a way of working—and *a* policy analysis is the process that results from applying this approach to a policy problem. Some authors show how this process can be structured in phases and represented schematically by process diagrams, such as the one in Fig. 5.1. Such diagrams relate to the design of a policy analysis (as a process) like architecture relates to the design of a building: they provide generic structures and principles, but no specifics. On a more operational level, textbooks on policy analysis describe many methods, tools, and empirical cases that can be useful in a policy analysis, but these methods and tools do not address "design"; they are for a policy analyst what construction techniques and material characteristics are for an architect: one should be knowledgeable about them to make a feasible design, but they do not determine the design.

P. W. G. Bots (✉)
Delft University of Technology, Faculty of Technology, Policy and Management,
P.O. Box 5015, 2600 GA, Delft, Netherlands

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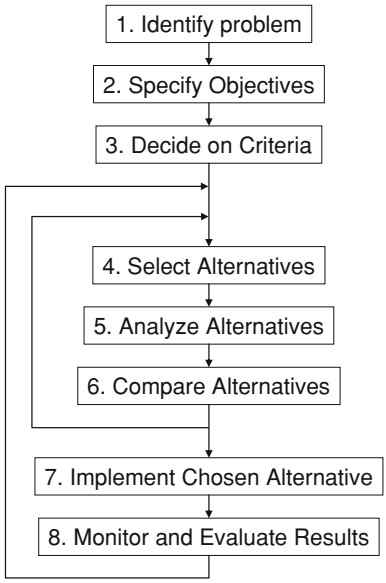


Fig. 5.1 A process diagram for a public policy analysis (Walker and Fisher 1994)

The aim of this chapter is to develop a design-oriented way of thinking about policy analysis that can bridge the gap between the conceptual and the practical, between the six axes of the hexagon model proposed in Chap. 3 (see also Mayer et al. 2004) and the methods discussed in Chaps. 7 and 8, and the Appendix. The chapter is based on the proposition that a policy analysis is designed in a process of means-ends analysis. Provocative as it may seem, it contends that the end objective of any policy analysis is to change people's minds.[1] The analyst diagnoses the client's problem as described in Chap. 4, assesses this in terms of "whose minds need to be changed?", and then plans a set of policy analysis activities (the means) that will—insofar as possible—achieve these "changes of mind" (the ends).

Section 5.2 clarifies this idea and how it relates to the hexagon model. Section 5.3 clarifies the notion of "design" and how it applies to policy analysis. The case example presented in Sect. 5.4 then shows that the actual "building blocks" or "functional components" of a policy analysis are planned communicative interactions. This suggests that designing a policy analysis is a matter of "putting the right parts together in the right way". This idea of designing and assembling communicative interactions is elaborated in Sect. 5.5, where further analysis of the

[1] Terms like "enlighten" or "facilitate learning" sound less manipulative, but do less justice to what a policy analyst aims to do: make people see the world in a new way. All definitions of policy analysis would seem to entail this purpose: when "speaking truth to power" (Wildavsky 1987), the analyst tries to convey actionable insights to decisionmakers; when "making sense together" (Hoppe 1999), the analyst tries to lead different stakeholders to a shared understanding of the issue.

case example shows that a "grand design" approach fails for policy analysis because the insights produced by earlier interactions must be taken into account while designing later interactions. Section 5.6 shows how this dependency can be handled by taking an "adaptive design" approach. The second case example presented in Sect. 5.7 illustrates that the analyst has to make numerous design tradeoffs, and that the hexagon model provides guidance for doing this in a systematic way.

Implicit in the "adaptive design" approach is the notion that a policy analysis *develops* as the analyst designs and then realizes communicative interactions one at a time, adapting to changes in the context and in her[2] client's needs. Unlike technical artifacts such as bridges and airplanes, a policy analysis is not designed first and then realized. The scope of what the analyst can design is limited to that of a single communicative interaction, and even this type of artifact is difficult to design because of the unpredictability of the "human factor". The final conclusion of this chapter may therefore seem a bit bleak: policy analysis is often thought of as an art or a craft, because it is so difficult to design a policy analysis. What makes this chapter worth reading is that one becomes a better policy analyst by understanding *why* this is so difficult, and how to do it better.

5.2 Policy Analysis: Changing People's Minds

Chapter 3 of this book showed how the diversity in styles of policy analysis can be understood in terms of six dimensions, each corresponding to a specific class of activities and a specific set of values. These policy analysis activities all aim to make people change their minds about something or someone:

Clarify values & arguments—This class of activities aims to elicit the fundamental values ("why does this stakeholder prefer… to…?") and arguments ("by what logic does… imply/follow from…?") that underlie the perceptions and positions of different stakeholders. It includes activities such as analyzing the political debate in the media, identifying and interviewing stakeholder representatives, organizing focus groups, etc. In the simplest case, the analyst seeks answers to these questions to enlighten herself while diagnosing the client's problem. In other cases, the analyst also seeks to make the client see the key elements of the policy debate, or to make all stakeholders involved aware that they perceive an issue in different ways.

Research and analyze—This class of activities aims to obtain knowledge of the past and present states of the system ("what is the situation?"), how the system responds to changes ("what happens if…?"), the underlying causal relations ("what mechanism explains…?"), and possible future states ("what are the chances that… (a change, an action) will occur?"). Knowledge creation by

[2] To make functional use of gender, the policy analyst is referred to as "she", all other actors as "he".

definition entails a change of the mind of the scientists, as they gain new insights from their activities (literature review, empirical data collection and analysis, controlled experiments, model simulations, etc.). The analyst's mind changes as she interacts with scientists: she reads their publications; she interviews experts on the appropriateness of theories and models; she integrates knowledge obtained from different sources, and finds ways for dealing with inconsistencies; she commissions studies to obtain additional data or better models. Meanwhile, the analyst may already disseminate the knowledge obtained in order to change the mind of the client and of other stakeholders.[3]

Design and recommend—The analyst performs or commissions this type of activity to discover existing possibilities and invent new possibilities for action ("how can we… ?"), to predict the consequences of actions ("what happens if we… ?"), and to compare and judge alternative courses of action in the light of the client's interest ("is… to be preferred over…?"). To this end, the analyst typically forms a design team and leads this through a process of comparative analysis, reasoning by analogy, and creative synthesis, to produce alternative policy options. Similar to research and analysis activities, this changes the minds of those involved in the activities. The analyst then confronts the client and other stakeholders with the policy options while clarifying their consequences. This may change these actors' minds: they may come to see a broader range of feasible solutions, or to realize that only a few options are promising, but they may also come to raise their expectations, or to change their preferences, and thus change the policy design problem. While working toward recommendation of a policy option, the analyst typically alternates between creative design (variety) and critical appraisal (selection).[4]

Provide strategic advice—With this class of activities, the analyst seeks to clarify the political aspects of the policy issue to the client to enable him to better protect his interests and achieve his goals in the policymaking process. Strategic action is based on anticipation by one stakeholder of how other stakeholders will respond to certain actions (Schelling 1960; Walsh and Fahey 1986; Mu et al. 2010). The analyst will, therefore, perform (or commission) research and analysis activities to answer questions like "how do others perceive… (the system, what is desirable, how one can act, how others can act, the social relations between stakeholders)?", "how do others reason?", and then, combining the answers, "how

[3] Building on the "seven standards of knowledge utilization" defined by Knott & Wildavsky (1980), Landry et al. (2003) empirically measured the extent of "change of mind" as a result of university research (here referred to as "the work") on a 6-point scale: 1-Reception (the actor received the work), 2-Cognition (the actor read and understood the work), 3-Discussion (the actor participated in meetings for discussion and popularization of the work), 4-Reference (the actor cited the work in his own professional reports), 5-Effort/Adoption (the actor promoted the use of the work in decisionmaking), and 6-Influence (the work influenced decisions in the actor's administrative unit).

[4] For more details on policy design processes, see for example Brobow and Dryzek (1987), Schneider and Ingram (1988), Walker (1988), Smith and Browne (1993), Sidney (2007).

will they respond to… ?", "how are my client's stakes affected if they… ?", and "who have such influence that they can change the perception of others?". She may then use the insights obtained to design and recommend strategic action (Pan and Kosicki 2001). By providing strategic advice, the analyst aims at changing only the minds of the client and his "inner circle" of trusted individuals, since sharing the insights obtained with other stakeholders might change their minds in ways that would invalidate the analysis (Young 2005).

Mediate—This class of activities aims to mitigate or even resolve a conflict among two or more stakeholders. The analyst typically assumes the role of "neutral third party". She seeks first to understand the conflict (What issues are at stake? How do the actors involved perceive these issues? How do they perceive each other? What events have led to conflict?), and based on the insights obtained via this conflict analysis, she develops an appropriate conflict resolution strategy. When the conflict is substantive rather than emotional, the analyst will seek to widen the problem scope and find an acceptable "package deal". When stakeholders have hostile feelings toward each other, the analyst may try to "rationalize" the conflict, shifting the focus from the emotional back to the substantive. Different strategies require different types of mediation. When hostility precludes face-to-face negotiation, the analyst may attempt deal-making via "shuttle diplomacy", trust building by "orchestrating a dialogue", or settling via "arbitrage" (Lewicki et al. 1992; McGreary et al. 2001; Deutsch et al. 2006). In all cases, mediation requires that the actors who are in conflict change their minds: cognitively about the situation, and/or emotionally about other actors.

Democratize—With this class of activities, the analyst seeks to sensitize policymakers not only to the views of experts and political elites, but also to the views and opinions of ordinary citizens and laymen that tend to be overlooked in policy decisionmaking. To this end, she will try to identify all individuals and groups who may take an interest in the policy issue (who will be involved in, or be affected by, the changes that are expected, or the actions that are being planned), she will investigate how these people can be represented in the policymaking process, and will seek to create "platforms" or "forums" that will facilitate and legitimate expression and discussion of opinions (Habermas 1984; Dryzek 1990; Webler 1995). Meanwhile, the analyst also seeks to sensitize the actors involved to the complexity of multi-stakeholder policymaking, for example by presenting alternative views on the policy issue, highlighting the multicausality in the system, and the interdependencies among the actors (Rotmans et al. 2001; Healy 2005; Bekebrede 2010).

In sum, all policy analysis activities are based on the assumption that actors behave deliberately, and that to bring about change requires changing the beliefs and attitudes of actors. It appears that all six classes of policy analysis activities rely on communicative interaction to achieve this: scientists debating on data, models, and theories, designers presenting their plans to administrators, a strategy group discussing different scenarios, attorneys contesting a ruling, citizens voicing their opinions to politicians, a project sponsor reading a progress report.

The contribution of the analyst then lies in designing, arranging, and directing an often intricate set of communicative interactions—brief or extended, face-to-face or mediated, bilateral, one-to-many, or many-to-many—that eventually produce desirable outcomes for her client. The key to designing a successful policy analysis is to diagnose a policy context, to determine whose minds need to change in the interest of the client, and to design communicative interactions that will produce these changes.[5]

5.3 Designing a Policy Analysis = Structuring Flows of Communication

The word "design" is a noun as well as a verb. When we say "*a* design", we often refer to a picture of some kind: the sketch of a garment, the layout of a garden, the technical drawing of a machine. A design is a representation of something that does not yet exist, and, more specifically, a thing that when it becomes real will serve some purpose. In other words, the noun "design" denotes a representation of an artifact that provides sufficient guidance for the realization of this artifact within a given context.

The verb "to design" denotes a purposeful intellectual activity that produces a design-as-noun. Design-as-verb is purposeful in the sense that the artifact is to perform a certain function: the designer has in mind a set of goals that are to be attained when the artifact is realized in a given context. To express this function, a design-as-noun describes the structure of the artifact, the context in which it is placed, the changes it will cause there, and the goals these changes are to serve.

The idea that the realization of an artifact causes changes in the environment in which it is realized can be clarified by viewing an artifact as something static (a "structure") that guides something dynamic (a "flow"). Structure and flow are two essential aspects of any artifact: the structure is the aspect that is immediately linked to its realization (think of a bridge, a power plant, a microprocessor); the flow is the aspect that is immediately linked to its function (a flow of traffic, of electricity, of data).[6] The flow occurs when the structure is realized in its

[5] As Susskind et al. (2001, p. 98) put it, "Policy analysis is composed of both intelligence and social interaction. If analysis were purely intellectual, analysts would take center stage. Likewise, if policy analysis were totally interactive, there would be no need for analysts."

[6] Ropohl (1999, p. 63) links structure immediately to function, but it is wiser to keep flow and function as separate concepts, because some of the flows that occur once the artifact has been realized in its context may not contribute to the attainment of the goals the designer had in mind (e.g., a blowout while drilling for oil, or the flight of capital after a tax reform).

environment. When designing, the designer imagines alternative flows that can achieve the goals,[7] but designs typically emphasize structure, because that is the aspect of the artifact that needs to be realized to produce the flow (Bots 2007).

It is essential for design-as-verb that a representation of the intended form and function of the artifact—the design-as-noun—is produced and can be assessed *prior to* the realization of this artifact. A design-as-noun allows an *ex ante* assessment of the changes the artifact will cause in the real world, and it allows the designer (and also the client and the other actors involved in realizing the design) to judge the merits of alternative designs. Without the separation in time—by a period of rational deliberation—of design-as-verb and realization, the artifact would not be designed, but developed.

When applying this conceptual model of design to policy analysis, it takes some effort to distinguish its structure and flow aspects. As most authors consider *a* policy analysis to be the process that results from applying the policy analysis approach to a policy problem, it helps to think of this process as a flow, and then to look for the structure that guides it. When viewed this way, a policy analysis is a flow of policy analysis activities: discussions with the client, interviews with stakeholders, desk research, model construction, presentations to the client, etc. It is this flow of activities that produces the desired results, such as, for example, enlightening the client about the consequences of alternative policies. The structure that guides this flow consists of the configuration of actors brought together at different moments in time, and the agenda that organizes the communicative interactions among them. One could say that a policy analyst designs and realizes a "belief processor", a kind of intellectual device that, by virtue of its configuration (people and the way they are briefed and "programmed" by the analyst), performs a series of activities that affect the belief systems of the people involved.

5.4 An Illustrative Example

The following case example illustrates that a policy analysis can be seen as a set of planned communicative interactions. For the sake of brevity, the case examples in this chapter are presented in a rather rigorous summary format. They have been selected not only because they constitute good exemplars for the concepts in this chapter and the author has first-hand knowledge of them, but also because the policy analysis processes and context are well documented in journal articles.

Case 1—Priority Setting in National Health Care

Source: A detailed account of this policy analysis can be found in (Bots and Hulshof 2000).

[7] Some artifacts (think of dams, insulation, customs regulations) are designed to prevent a flow from occurring, but this also fits the general idea of "something static that guides something dynamic".

Client: The client who sponsored the analysis was the Department of General and International Health Policy of the Dutch Ministry of Public Health.

Policy issue: Defining high-priority (focal) areas within the public health sector for the 1995–1998 Dutch national health policy, which would constitute the reference for, among others, allocation of financial resources. The consequences of this policy would be felt especially by hospitals, research institutes, the pharmaceutical industry, and special interest groups such as patient organizations.

Diagnosis: The client needed an authoritative rationale for the identification, prioritization, and eventual selection of these focal areas. As these focal areas would be part of a bill to be ratified by the Dutch Parliament (VWS 1995), the analysis should have the approval of key actors in the public health policy arena.

Function of the analysis: It should generate focal areas at an appropriate level of abstraction (easily recognizable, but not specific projects or organizations in search for funding), and recommend a priority ranking based on public health criteria that could be measured objectively. In terms of the hexagon model presented in Chap. 3, this strongly emphasized *research and analyze* and *design and recommend* activities.

Form of the analysis: The policy analysis would follow the multi-criteria decision analysis (MCDA) approach, see e.g., Lootsma (1999) and Ehrgott et al. (2010). It would build on the best available information for health policy preparation: the *Public Health Status and Forecasts* (PHSF), an authoritative 800-page report on the health situation, morbidity, and mortality in the Netherlands (Ruwaard 1994), and the *Financial Overview of the Care Sector* (FOCS), which provided detailed data on the volume and cost of health care (FOCS 1993). To further increase its authoritativeness, stakeholder representatives would be involved in the crucial decision phases. The global design comprised eight steps:

Step 1. *Cluster diseases to be taken into account.* Adopting the medical classification used in the PHSF, the diseases accounting for more than 2 % of all deaths and/or 2 % of health care or 1 % of all hospital releases were selected and aggregated into 37 clusters based on similarity of the clinical picture and cause of the disease.

Step 2. *Determine criteria for screening disease clusters.* This screening (Walker 1988) should identify the set of most policy-relevant disease clusters. In line with the PHSF, three criteria were operationalized: projections to 2010 of prevalence (the absolute number of people having the disease at a given moment), projections to 2010 of potential years of life lost (an indicator for mortality, weighing death at young age heavier than death at old age), and cost of delivered health care specified for treatment of each disease cluster.

Step 3. *Collect data on screening criteria.* To facilitate comparison, the PHSF data and FOCS data were mapped onto a discrete 10-point interval using different linear and nonlinear progression factor scales. The results were discussed with policymakers at the Ministry of Public Health, who eventually opted for these logarithmic scales: $\log_2(n/3000)$ for prevalence, $\log_2(n/750)$ for years of life lost, and $\log_2(n/1.5 \text{ million})$ for cost of care.

Step 4. *Select most policy-relevant disease clusters*. The discussion with policymakers revealed that they considered prevalence, potential loss of life, and cost of delivered care to be of equal importance. The 37 disease clusters were therefore ranked on the sum of their scores on these criteria. The sum score showed a clear drop after the 14th cluster. Sensitivity analysis using different weights showed that this ranking was very robust: the top 14 disease clusters remained the same, with few rank reversals.

Step 5. *Determine policy goals and focal areas.* The policy goals were operationalized as prolongation of the healthy life expectancy, improvement of the quality of life for diseased and handicapped, and reduction of premature death. The lack of independence between reduction of premature death and healthy life expectancy (and to a lesser extent also the quality of life during illness) was accepted. The focal areas for resource allocation were defined as "cure" (including treatment aimed at reducing the harmful effect of an incurable disease, such as insulin injections for a patient with diabetes), "care" (nursing the incurably ill, handicapped, and elderly), and "prevention" (e.g. health education, and including screening programs) for each of the top 14 disease clusters identified in Step 4.

Step 6. *Impact assessment.* A group of 12 public health experts was invited to a computer-supported consensus-building session. They were asked to estimate (on a 5-point scale) for each focal area how strongly resource allocation to this area would contribute to the attainment of each of the three policy goals. A score of 0 indicated infeasibility (e.g., cure for dementia, or prevention for mental handicaps); 1 indicated very little contribution; and 4 indicated a strong positive effect. Participants were asked to enter a question mark if they felt incompetent to judge about an impact. The computer software aggregated the individual scores and displayed the resulting impact matrix on a public screen, while highlighting cells with significant differences among individual scores. These were discussed, resulting in a final score for each cell.

The final selection of focal areas was made in two steps during a half-day computer-supported consensus-building session with stakeholder representatives.

Step 7. *Determine relative importance of policy goals*. The participants were asked individually to express their weighing of the three goals by distributing 100 points over the three policy goals. The resulting scores were aggregated, displayed, and discussed.

Step 8. *Assess effectiveness of allocating resources to focal areas.* Combining the impact matrix from Step 6 with the weights obtained in Step 7, an overall score was computed for each of the 42 focal areas as the sum of (effect score $\times$ goal weight) for the three goals. The focal areas were sorted in order of decreasing total score, displayed on a public screen, and discussed. The outcomes for alternative goal weights suggested by participants were projected side-by-side, revealing the robustness of a large subset of the focal areas. The group agreed to include the list of all $14 \times 3 = 42$ focal areas with their impact scores on the three criteria, ranked on the basis of the aggregated weights, as an appendix to the health policy bill (VWS 1995).

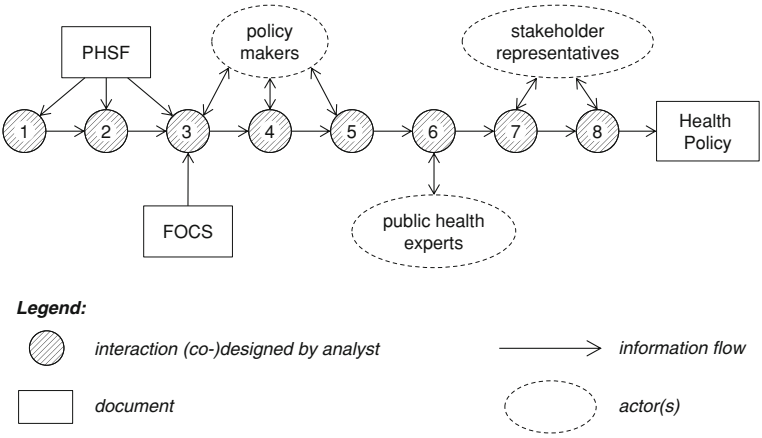


Fig. 5.2 Overall design of the policy analysis in the first case example

This case example brings to the fore several important points concerning the design of a policy analysis. First, each step was designed specifically for the given context. Although the overall design was based on the generic "architecture" that characterizes MCDA approaches, and may be depicted in a process diagram like the one in Fig. 5.1, the actual design decisions are reflected in the division into eight specific steps, the specific activities, data sources, and people involved in each step, and the intended information flow from one step to the next. Figure 5.2 shows the steps, the data sources, and the people (other than the analysis team) involved in each of the eight steps, and the information flows.

The key design decisions reflected in Fig. 5.2 are: to use the PHSF and FOCS as data sources, to consult policymakers at the Ministry to obtain criteria for screening, to invite a panel of domain experts (rather than policymakers or stakeholder representatives) for the consensus-building exercise concerning the impacts of policy options, and to let stakeholder representatives decide on the eventual prioritization. Decisions that are not shown, but were likewise important and deliberately made, concern the selection of individual people to involve, the ways in which information was presented, and the selection, sequence, and timing of the activities during the group sessions.

The case example also illustrates the general idea that when an artifact is designed to function in a context, its structure must be firmly embedded in this context, or it will fail to produce the desired flow. If, when building a bridge, a solid foundation is lacking, it should be laid, or the intended function of the bridge (transporting traffic) is likely to fail. The policy analysis in our example used two authoritative previous analyses (of the *research and analyze* type) as its foundation: the PHSF and the FOCS. Without the widely accepted indicators for the impact of diseases on public health (incidence, prevalence, mortality, quality of life during illness) and cost of care, or without authoritative data on these

indicators, the analysis would have failed, or its scope (in time, effort, and people involved) would have had to be extended to lay this foundation first.[8]

The most important point illustrated by the case example is that each of the eight steps in the policy analysis is a communicative interaction. Each step brings together (either face-to-face or mediated via, for example, written documents) a group of people so that they may influence each other with their ideas. Each step is a functional component of the overall policy analysis, designed so that it may change the minds of specific people—that is, either alter or strengthen their beliefs about one or more specific topics. In the first steps, the analysis team (not trained in medicine or epidemiology) learned how to cluster diseases by studying the PHSF. The subsequent discussions about the definition and operationalization of criteria to select the most policy-relevant disease clusters brought new insights for both the client and the analysis team. During the expert meeting, initial disagreement among participants on the effectiveness of cure, care, or prevention was in most cases resolved through argumentation; only rarely did the panel "agree to disagree". Although the participants in the final consensus-building session will probably not have changed their minds about the relative importance of the criteria, they were enlightened by the eventual ranking of options, and reassured by its robustness to changes in weights for criteria. The analysis thus succeeded in providing a sound basis for priority setting in the Dutch national health care.

In sum, designing a policy analysis means designing communicative interactions. Note that, in terms of the hexagon model of Chap. 3, the analysis in the case example combined different types of policy analysis activities. Its primary function was to *design and recommend*: the creative ideas to cluster similar diseases and to define high level policy options as (disease cluster, measure type) pairs can be seen as the "design" part, while the list of top priority policy options compiled at the end of the analysis constitutes the "recommend" part. In addition, the analysis comprised some *mediate* activities (building consensus on the ranking of clusters, and agreeing to proceed with only 14 clusters), and a *research and analyze* activity (assessing the relative effectiveness of prevention, cure, and care for each cluster).

5.5 Policy Analysis = Designing a Series of Communicative Interactions

When designing a communicative interaction as part of a policy analysis, the analyst must find out whose beliefs have to be changed, about what they should change, and the extent to which they should change. She must then choose the appropriate form. A communicative interaction may range from a 20 min

[8] It is instructive to read the second case reported by Bots and Hulshof (2000). This policy analysis, commissioned by the same client, and based on a very similar design, was much less successful, mainly because the definition of the criteria, and the collection of impact assessment information had to be based on less authoritative sources.

consultation with an expert to a six month model-based scientific inquiry, from a 2 h meeting with stakeholders (or a focus group) to a series of five full-day citizens' jury meetings, and from e-mailing a one-page policy brief to a small targeted audience to publishing an 800-page written report. An experienced policy analyst has hundreds of templates for communicative interactions in mind, and is capable of combining them into new ones. Given a client and a situation, she will design the policy analysis by (iteratively) addressing the following questions:

1. Whose minds need to be changed? This will determine the targeted actors.
2. What kind of change-of-mind is desired? This will determine the orientation of the policy analysis within the hexagon model of Chap. 3.
3. What type(s) of communicative interaction can achieve this change-of-mind? This provides the designer with an initial set of alternative design options.
4. Is the present state of the policymaking process such that the preconditions for these communicative interactions to be effective are met? This effectiveness assessment may rule out certain options.
5. Are the client's resources such that the remaining communicative interactions can be implemented? This feasibility assessment may rule out certain options as well.
6. What side effects can be expected when a communicative interaction is implemented? Here, the analyst should consider how the remaining options may affect the state of the policymaking process along all six dimensions of the hexagon.
7. *Closure*: Which of the remaining options is to be preferred? Having established their effectiveness and feasibility, the analyst now assesses the relative efficiency, robustness, and flexibility of the remaining options, and makes the tradeoffs among them transparent.

To answer these questions, the analyst will perform a problem diagnosis of the type described in Chap. 4 (in particular, in Sects. 4.5–4.7).

Provided that the option-screening questions 4–6 above do not rule out all conceivable types of communicative interaction, the analyst then proceeds to detailed design. As proposed in Sect. 5.3, a communicative interaction should be thought of as a configuration of minds that, given a specific set of inputs, will generate a set of outputs.[9] The interaction itself is intrinsically dynamic (a flow), so the analyst designs the configuration and the set of inputs (the structure). The latter may include a format specifying what the outputs should look like (e.g., an impact table, a prioritized list of options, or a map of some kind[10]), but it may also be that the desired outputs are intangible (e.g., trust among the participants). Likewise, the inputs may include an interaction procedure (the computer-supported group sessions in Case 1 followed a rigorous agenda), but the design may also leave this

[9] The design of communicative interactions has become a research field in itself under the name "collaboration engineering" (Briggs et al. 2003; Kolfschoten et al. 2006).

[10] See Carton (2007) for an extensive study on the role of maps in policy analysis.

unspecified (in an expert meeting, for example, the participants are free to figure this out for themselves). When deciding for communicative interaction, and especially when choosing for forms of interactive analysis, the rules of the game for process management as presented in Chap. 6 should be considered as guiding principles for the detailed design.

If, after considering questions 4–6, the set of remaining options is small, or their effectiveness too uncertain, this calls for a reconsideration of questions 1 and 2. The results of the first scan by the analyst may cause the client to change his mind. If that happens, a reiteration over questions 3–7 is called for. If the targeted actor group and desired change-of-mind remain the same, then a staged approach is needed; that is, the analyst will have to investigate whether and in what way the preconditions that are presently not met may be attained. If, for example, knowledge about the soil and groundwater tables in some geographic area is lacking, this may preclude the design of hydrological measures to improve conditions for specific land uses. A lack of financial resources may preclude research activities to obtain new knowledge. High levels of conflict among stakeholders may induce strategic behavior that precludes elicitation and clarification of policy objectives (see Case 2 in Sect. 5.7 for more details on these examples). In the face of such obstacles, the analyst goes essentially through a problem solving and planning process to find a sequence of interactions that eventually leads to attainment of the client's objectives.

A key observation in the health policy case example (but representative for most policy analyses) is that the communicative interactions were designed not at the beginning of the process, but in meetings of the analysis team that took place in-between the eight steps. Although the overall process—the standard MCDA stages of defining decision options and criteria, assessing the impact of options on criteria, prioritizing criteria, and ranking options—was foreseen and approved by the client, the most important design decisions (e.g., to adopt the medical classification used in the PHSF, and the 2 and 1 % thresholds in Step 1, to consult only Ministry employees in Steps 3, 4 and 5, and to have a face-to-face expert meeting to build consensus on impacts in Step 6) were made during such in-between meetings.

Some of these in-between meetings were planned just as carefully as the eight communicative interactions in Fig. 5.2. The designs for the expert panel session (Step 6), and the stakeholder representatives session (Steps 7 and 8), were actually pretested in a meeting during which the analysis team and the client and some of her staff first executed the design by "playing" the roles of the participants, then reflected on the process to see whether the computer support was adequate and the agenda was time-wise feasible, and then tweaked the design accordingly. This shows that a policy analyst will often find herself designing communicative interactions for the analysis team (and often the client as well) to discuss, and then decide on, design choices concerning subsequent communicative interactions. Figure 5.3 visualizes this by also showing the "design interactions"—that is, the communicative interactions that produced the design for the communicative interactions already shown in Fig. 5.2.

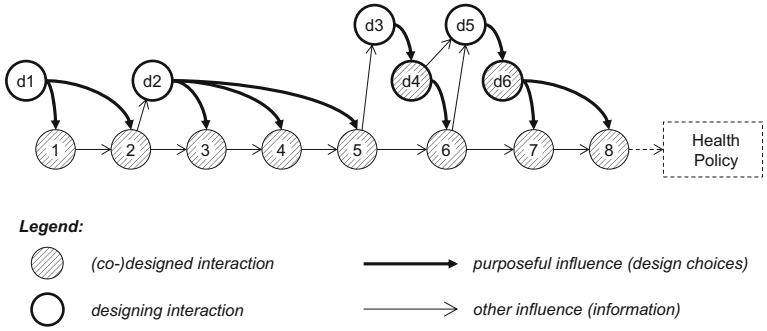


Fig. 5.3 Communicative interactions for designing communicative interactions

As in Fig. 5.2, time proceeds from left to right, and circles denote communicative interactions, such as face-to-face meetings, in which individual actors and/or individual delegates of organized actors exchange opinions. Bold-rimmed circles denote designing interactions, while the gray circles denote communicative interactions that are co-designed by the policy analyst. Figure 5.3 shows that the analysis team first decided (interaction d1) on the specific methodology for steps 1 and 2, and used the results of these steps while designing (interaction d2) the subsequent interactions: compile data from the PHSF and discuss the results with policymakers at the Ministry (interaction 3), perform the screening of disease clusters (interaction 4), and define the focal areas for resource allocation (interaction 5). Having established which disease clusters were to be considered in the subsequent steps, the analysis team composed the panel of experts and developed the procedure and supporting software that would efficiently produce an authoritative impact matrix (interaction d3). Procedure and support tools were first tested and fine-tuned in a simulated expert panel (interaction d4), and then implemented for real (interaction 6). A similar "design-test-implement" approach (interactions d5 and d6) was taken for the session with stakeholder representatives (interactions 7 and 8).

Design interactions are typically initiated and led by the policy analyst, but involve other members of the analysis team and/or external people—hence the term "*co*-designed interaction" for the gray circles. The co-designed interactions are the functional artifacts that first are *planned* in terms of who will participate, what these individuals will communicate about, and what type of "changes of minds" should be brought about, and then are *realized* by inviting people, setting the agenda, mobilizing and using the necessary/available resources, and consolidating results, insofar as this is useful for future communicative interactions and the eventual overall performance of the policy analysis. Note that when design interactions themselves are designed (e.g., interactions d4 and d6), they are depicted as bold-rimmed gray circles.

Instead of information flows, the arrows that connect the circles now symbolize a type of causal influence: A → B means that the process and outcome of communicative interaction A are co-determinants of the process and outcome of

communicative interaction B. A bold arrow denotes that the "flow" of communicative interaction A is *intended* to co-produce the "structure" of communicative interaction B. Thus, from all design interactions in Fig. 5.3 there departs at least one bold arrow to a (co−)designed interaction. The thin arrows denote other causal influences (typically flows of information) from one interaction on another—influences that affect only the flow of the indicated interaction, or possibly even the structure, but then without the analyst's intention to do so.

5.6 Policy Analysis = Adaptive Design

An analyst-as-designer cannot impose a structure like the ones in Fig. 5.1 or 5.2 on the entire policymaking process, but—as depicted in Fig. 5.3—she can influence this process by structuring certain parts of it. The set of designed communicative interactions is what is then commonly referred to as "the policy analysis". Separating between structure and flow helps to make clear what a policy analyst *can* design. The dynamics that are inherent in the policymaking process in which a policy analysis is embedded make it practically impossible to design a policy analysis as a whole and then realize it as planned. As realization activities proceed, the "time and space horizons for design" (Simon 1981, p. 178) move, and may reveal new means and ends that call for a change in the design. If the policy analysis does not change, it may become irrelevant (resulting in a report that is ignored). In practice, this often happens (with fixed contracts, with hard-wired terms of reference, work packages, deliverables, etc.).

One way to deal with this moving design horizon is to see a policy analysis as a process of "adaptive design". Keen (1980) coined this phrase to characterize the development process for a decision support system (DSS)—a computer-based artifact that assists decisionmakers in dealing with an ill-structured problem. In Keen's "adaptive design" model, DSS development is characterized by three dynamic interaction loops among the DSS, its builder, and its user (the decisionmaker). As a policy analysis is in many respects similar to a DSS, these three elements and the loops connecting them can be translated in a straightforward manner, resulting in the diagram in Fig. 5.4.

The arrow pairs denote three interaction loops that together constitute the adaptive design process:

1. In the *client + other stakeholders* ↔ *designer* loop, the client and other stakeholders communicate needs and policy objectives, while the policy analyst provides method and structure for a proper "meta-discourse" about the policy issue. In this "meta-discourse",[11] the policy context is diagnosed and the purpose(s) of the policy analysis are (re)defined.

[11] We use the term "meta-discourse" to distinguish this communicative interaction between designer and client + other stakeholders from the policy discourse (Fischer and Forester 1993; DeLeon 1998; Torgerson 2003) to which the policy analysis will contribute.

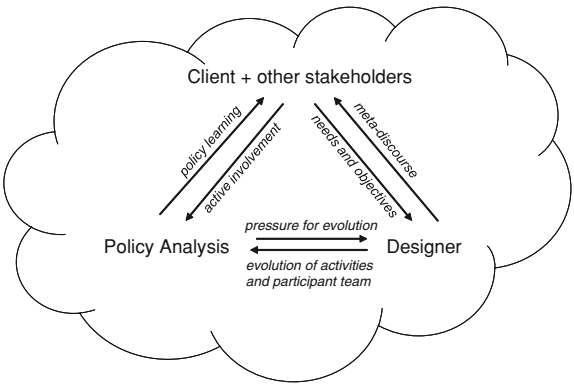


Fig. 5.4 Adaptive design of a policy analysis (after Keen 1980)

2. In the *designer* ↔ *policy analysis* loop, the policy analyst designs the policy analysis activities (communicative interactions) in terms of what, how, and (especially) among whom, and then sees to their implementation. This produces an immediate feedback to the policy analyst that informs her about the effectiveness of the interactions. The analyst reflects on this feedback in terms of "what went as planned, what not, and why?" and this may lead her to reconsider certain design choices. Note that this loop may be fast enough (relative to the duration of an interaction) to allow adaptation by "improvisation in the field".
3. In the *client + other stakeholders* ↔ *policy analysis* loop, as part of the policymaking process, the client and other stakeholders participate actively in the policy analysis, contributing to its implementation, impact, and eventual effectiveness. Meanwhile, these actors also gain (new) insights about the policy context, (un)satisfactory situations, possible courses of action, etc. This intended (and sometimes unintended) "changing of people's minds" is a form of "policy learning" (May 1992).

Although Keen's model of adaptive design seems very appropriate for describing the design process of a policy analysis, it does not provide guidance for the design activities themselves. To get a grip on practical design of a policy analysis, the scope of the artifact has to be reduced to a scale where the "time and space horizons" are such that what is designed *can* be realized as planned.

Viewing communicative interactions as *the* building blocks for a policy analysis facilitates "adaptive design", as it renders all communication among analyst, client, stakeholders, and the general public subject to design. The diagram in Fig. 5.3 visualizes this. The policy analysis process thus unfolds as a series of "assess-design-intervene" patterns: the analyst evaluates the state of the policymaking process/context, designs one or more communicative interactions, and sees to their implementation. Together with other (i.e., unplanned) interactions in the context of the policy analysis, this leads to a new state, etc. This form of adaptive design fits well with the process view discussed in Chap. 6 of this book.

5.7 Policy Analysis = Making Design Trade offs

In the public health policy example, the context of the policy analysis was relatively stable: the idea—championed by the Minister of Public Health herself—of setting priorities in the health care sector on the basis of state-of-the-art epidemiological and financial information was not contested by the field. The mediation function of the analysis was secondary, and relatively easy to incorporate in the design. The following case example illustrates that designing a policy analysis becomes much more challenging when the analysis has to perform multiple functions because of a long history of conflict among stakeholders whose perceptions of the policy issue diverge, while authoritative knowledge of the system is lacking.

Case 2—Developing a Local Water Management Plan

Source: A detailed account of this policy analysis can be found in (Bots et al. 2011).

Client: The analysis was sponsored by a local water authority (water board) in the province of Drenthe in the Northeast of the Netherlands.

Policy issue: Defining a so-called "desired groundwater and surface water regime" (*Gewenst Grond- en Oppervlaktewater Regime*, or GGOR for short) for the Bargerveen, a nature area with Natura 2000 status (shaded area in Fig. 5.5). This GGOR would be an essential component of the Natura 2000 management plan, which the Provincial Government was to deliver before 2010. The main nature development objective, set by the Dutch Ministry of Agriculture and Nature Management, was to increase the area covered by a type of living high peat—unique in Europe—which is currently declining. This would require the groundwater level to be raised, which was expected to negatively impact the predominantly agricultural land use in the surrounding area. The GGOR should strike a balance between these competing water interests.

The shaded polygon indicates the Natura 2000 area, the outlined polygon the location of the hydrological buffer zone that was central to the eventual local water management plan.

Diagnosis: The client needed a water management plan that would in particular meet the needs of the farmers having land south of the Bargerveen, and the needs of the agency responsible for the Natura 2000 area, *Staatsbosbeheer* (SBB). These parties shared a long history of conflict, and they distrusted the water board, since a previous, long-debated compromise was unexpectedly vetoed at the last moment by the largest municipality in the area. What further complicated the situation was that the validity of available hydrological models of the area was contested.

Function of the analysis: It should revive the policy discourse among all interested parties, notably the farmers and SBB, but also the local residents, enterprises, and authorities (Ministry, province, municipalities, water board), and produce a GGOR that would be acceptable for all. In terms of the hexagon model

Fig. 5.5 Map of the Netherlands (*left*) showing the location of the Bargerveen (*right*)

in Chap. 3, this strongly emphasized *democratize*, *mediate*, and *design and recommend* activities.

Form of the analysis: The policy analysis would be based on the general GGOR procedure that had been agreed upon by the Union of Dutch Water boards and the national authorities responsible for rural development. This procedure first establishes reference water regimes: the *actual* regime that is currently in practice (AGOR), and for each land use function in the area (agriculture, housing, industry, nature,…) a theoretical *optimal* water regime (OGOR) based on best available knowledge. Next, alternative water regimes are defined and assessed in an iterative process until a regime is found that realizes a certain percentage (typically >70 %) of the optimal performance. If this criterion cannot be satisfied for the present land use functions using the available means for operational water management, changing land use and/or taking more radical hydrological measures may be considered. The GGOR procedure presupposes the use of hydrological models for *ex-ante* assessment of such measures, but does not prescribe particular forms of stakeholder involvement.

Being quite general, the GGOR procedure provided only a global "architecture" for the policy analysis. Since there were no clear steps, the actual process is described here as a sequence of five phases, each comprising numerous communicative interactions. The process is represented in three diagrams using the same "circles and arrows" notation as in Fig. 5.3, but now also showing relevant

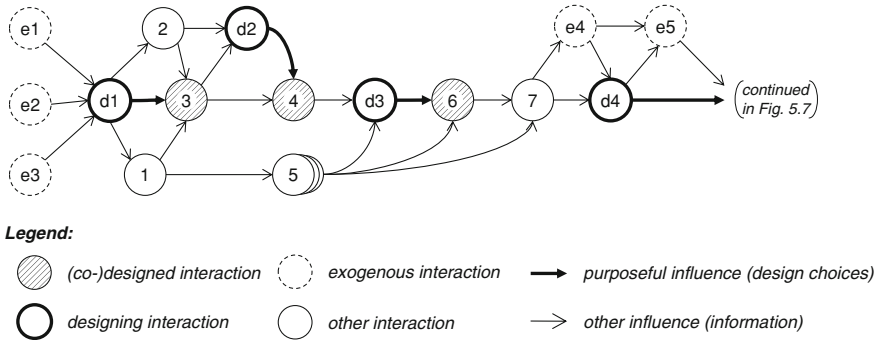


Fig. 5.6 Communicative interactions in the inception and preparation phases

communicative interactions that did not involve the policy analysis team. These interactions are represented as circles with a dashed rim. Although most are indeed external events that influenced the policy analysis, the policy analyst did co-design some of them (e.g., by preparing a presentation for interaction e4 in Fig. 5.6, and by advising strategically on interactions e8 and e9 in Fig. 5.7, and especially on interaction e12 in Fig. 5.8). The communicative interactions will be referred to in the text using the number codes in the circles. As in Fig. 5.3, the letter *d* is used to indicate design interactions. In addition, the letter *e* is used to indicate interactions that were exogenous to the policy analysis.

Phase 1. *Inception* (March–June 2006). The three communicative interactions that eventually led to the commissioning of the policy analysis were the official designation of the Bargerveen as a Natura 2000 area (e1), the formal agreement to use the GGOR procedure for establishing local water management plans (e2), and the decision by the European Commission to fund the Aqua Stress project (AQS) under the 6th Framework Programme (e3). In an informal meeting in March 2006 (d1), two staff members of the water board responsible for the Bargerveen, and a researcher involved in the AQS found that it was a good idea to jointly implement the GGOR procedure. They planned to meet again in June, bringing together the people that could form a joint working team (JWT) that would carry out the GGOR. Both the water board staff members and the researcher sought support (including financial resources) for the project (interactions 1 and 2). At the meeting in June (interaction 3), the water board commissioned the JWT to perform the policy analysis. A water board staff member would formally lead the project and be responsible for resource allocation. The actual GGOR process would be led by a hired consultant, who was highly experienced in managing participatory planning processes. Three AQS researchers would contribute expertise in modeling, decision support, design, and facilitation of group interactions; a fourth would observe and evaluate the process as part of her PhD research project. Additional hydrological and specific modeling skills were obtained by hiring a hydrologist from a large consulting firm.

Phase 2. *Preparation* (June–November 2006). As agreed during the June meeting (interaction 3), the process manager and AQS researchers first designed

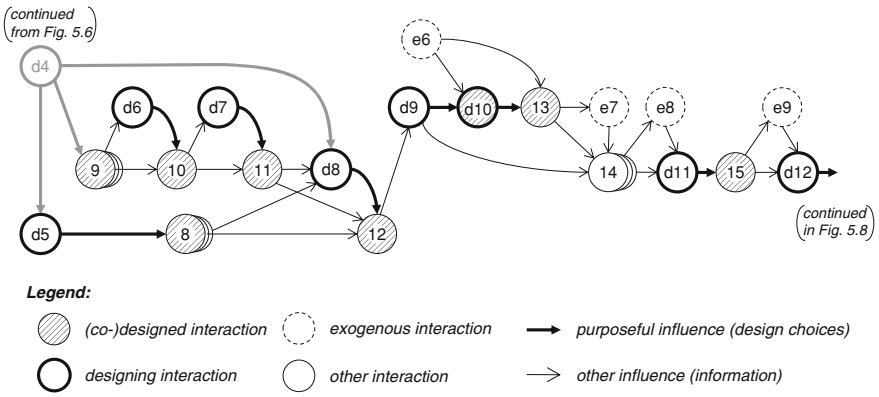


Fig. 5.7 Communicative interactions in problem analysis and model selection

(interaction d2) and then performed (interaction 4) a stakeholder analysis. Meanwhile, land use data were collected (multiple interactions 5). In the following JWT meeting (design interaction d3), the "plan of approach" for defining the GGOR for the Bargerveen was discussed. In outline, this plan followed the GGOR procedure. Since the real challenge was to revive the policy discourse among all interested parties and eventually produce a GGOR that would be acceptable for all, most of the JWT meeting focused on the question how to achieve stakeholder involvement in the process, and commitment to its outcome. The JWT decided to organize stakeholder participation by creating a "sounding board group" comprising representatives of all stakeholder groups (see appendix 1 of Bots et al. 2011 for details on its composition), and carefully planned the first meeting of this group (interaction 6, see also Table 5.1). This meeting was successful: the stakeholders concurred on the proposed approach, their role in it, and made several useful suggestions for the plan of approach. In the following weeks, the process manager updated the plan using all available information (interaction 7), and the project leader then presented it in the next regular meeting of the Executive Council of the water board (interaction e4). This led to some minor revisions of the plan (interaction d4), which was later formally approved in the next meeting of the General Council of the water board (interaction e5). This formal approval made the plan a solid foundation for many design choices later in the process. This influence is denoted by the arrow departing from e5; it is left implicit in Figs. 5.7 and 5.8 to avoid cluttering these diagrams

Phase 3. *Problem analysis* (October 2006–April 2007). To establish the optimal water regime (OGOR) for nature, the process manager assembled a "high peat expertise team" composed of ecologists and biologists suggested by SBB (interaction d5). As these experts had different views, several meetings (interactions 8) were needed before this team was able to specify the particular conditions needed for high peat to develop. As stated in the plan of approach, the process manager and the hydrologist held a series of meetings with small groups of farmers (multiple interactions 9) to discuss the OGOR for their land. The JWT then prepared

(interaction d6) a plenary meeting to discuss this OGOR using maps showing water levels and required hydrological measures. This discussion (interaction 10) led to some further refinements (interaction d7) and a second plenary meeting (interaction 11) in which the OGOR for agriculture was approved. Having established the two OGORs, the JWT met again to plan the second meeting of the sounding board group (interaction d8). As stated in the plan of approach, this meeting should focus on measures that would permit a water management regime with acceptable performance (typically 70 % of the OGOR performance). Unfortunately, the optimal regimes for nature and agriculture differed widely: the OGOR for nature entailed an expected highest groundwater level (in winter and spring) for the agricultural area that was several meters above the OGOR for agriculture. This suggested that the water board had only two options: to do nothing and accept a degradation of the peat vegetation, or to create a hydrological buffer zone around the Bargerveen at the expense of agricultural activities. The JWT therefore designed the second meeting of the sounding board group (interaction 12) with the aim (a) to share this insight with the participants, and (b) to clarify that the decision to radically change the water regime so that the high peat in the Bargerveen could flourish would go beyond the jurisdiction of the water board. The process manager would then propose to leave this decision to the province and the Ministry, since they have the capacity to either change the nature objectives, or authorize a change in land use and finance a buffer zone. The second sounding board meeting achieved only aim (a), as the key stakeholders strongly objected against handing over the GGOR decision to a higher political level. The farmers feared that decisions would be taken with insufficient consideration of their stake. SBB doubted the effectiveness of a buffer zone, and wanted more research on the effects of measures. In the subsequent JWT meeting (interaction d9), the team summarized the information needs voiced by the participants, and outlined what additional analysis would be needed.

Phase 4. *Model selection* (April–November 2007). The available computer models were MIPWA (Berendrecht et al. 2007) and Microfem (Hemker et al. 2004). The modelers suggested using MIPWA to explore the effects of measures. This model was especially designed to support GGOR processes in the northern part of the Netherlands, and its development (interaction e6) was co-financed by the water board. The Microfem model, tailored for the Bargerveen area but for a different type of calculations, was considered inadequate. Knowing that the Executive Board of the water board would disapprove a costly model exercise, the AQS modeler arranged a test with MIPWA (interactions d10 and 13), hoping to produce quick results. However, the modelers soon identified serious shortcomings of the model, and enhancement would take at least 1 year. The Executive Board thereupon decided (interaction e7) not to fund additional analysis (including further activities by the process manager!) unless the province would commit to supporting and financing a hydrological buffer zone if such a measure would prove to be effective. In the following months (May–September), the JWT offered strategic advice to the Executive Board (multiple interactions 14) on how to proceed with the GGOR process. In a meeting with the water board principal

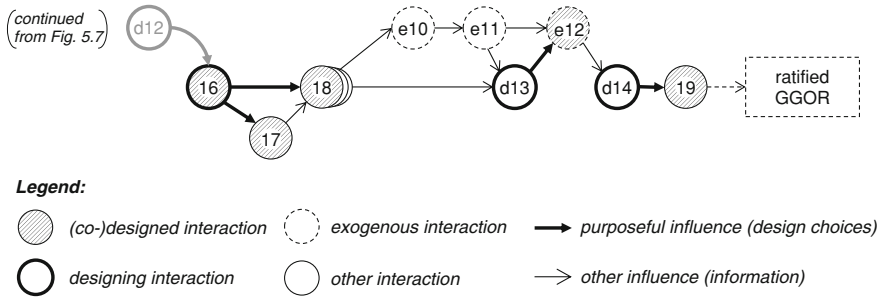


Fig. 5.8 Communicative interactions in assessment of options and policy formulation

(interaction e8), the responsible executive councillor of the province agreed to base her decision on the best possible prediction with the available models. The process manager forthwith designed (interaction d11) an expert meeting to which all parties could delegate a hydrologist to re-evaluate the Microfem model in a modeling session (interaction 15). The hydrologists concluded that this model could indeed provide an indication of the effectiveness of a buffer zone. When this outcome was presented to the Executive Board of the water board, the board decided to finance additional analysis (interaction e9).

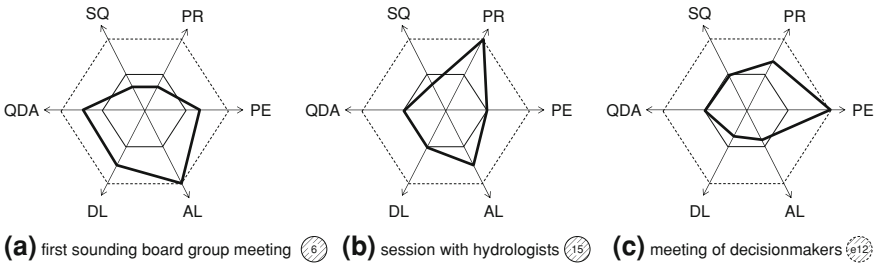
Phase 5. *Assessment of options and policy formulation* (November 2007–April 2008). The JWT quickly proceeded to prepare a third sounding board group meeting (interaction d12). The aim of this meeting (interaction 16) was to discuss the first results obtained with the Microfem model with the stakeholders, and to engage them in the subsequent steps. As agreed in this meeting, the modelers spent some days calculating the effects of a buffer zone of various types and sizes (interaction 17), while the process manager organized bilateral meetings with each of the key stakeholders to discuss the intermediate model results (multiple interactions 18). During these meetings, the modelers explained the structure and parameters of the model, as well as the scenarios evaluated. They presented the model outputs visually with maps that showed the predicted groundwater level related to the two OGORs. Meanwhile, the process manager stressed the limitations of the model and urged the participants to make clear what in their opinion could be decided on the basis of the Microfem model. These sessions were effective. The farmers proposed additional scenarios to evaluate the effects of the OGOR for agriculture on the Bargerveen, while the discussions also revealed their interest in drainage possibilities for wet parcels. SBB initially opposed using the crude Microfem model, but after a critical review of the model and the scenarios evaluated, they proposed some changes, and eventually agreed that the model was adequate for determining the order of magnitude of the effects of a buffer zone. It turned out that, to be reasonably effective, a buffer zone at the south side of the Bargerveen should be at least 500 m wide. This information sufficed for the province to give the green light for developing a GGOR featuring such a buffer zone (interaction e10). When the director of SBB likewise stated that he would support a GGOR with such a buffer zone (interaction e11), the process manager advised the water board principal (interaction d13) to invite the

executive councillor of the province and a high official of the Ministry to a meeting "behind closed doors" to make a policy decision. In this meeting (interaction e12), the principal—briefed with the latest analysis results, including review of national and regional budgets earmarked for agricultural land reforms and nature development—managed to obtain commitment of both the province and the Ministry to finding the financial resources that would be needed to implement a hydrological buffer zone. This hurdle taken, the JWT could plan (interaction d14) a final sounding board group meeting (interaction 19) in April 2008 to agree on a GGOR in principle. This final meeting marked the end of the policy analysis.

The GGOR—in principle, because the funding was not firm yet—comprised a 500 m wide buffer zone along two-thirds of the south border of the Bargerveen (see Fig. 5.5), plus measures to compensate the other stakes. In October 2008, the water board, the Ministry of Agriculture and Nature Management, the province of Drenthe, and SBB signed a formal agreement on the GGOR-in-principle (still pending the funding) for the Bargerveen and its surrounding. The definitive GGOR (with a total budget of €20 million) was ratified by the General Board of the water board in May 2009, and formally approved by the provincial council in September 2009.

This account of the Bargerveen policy analysis in five phases illustrates that policy analysis is a process of adaptive design. The gray circles in Figs. 5.6–5.8 show which parts of the policy analysis were designed (as artifacts), while the bold-rimmed circles show the design activities. Compared to our health policy case example in Fig. 5.3, our second case example features many more white circles (i.e., communicative interactions that were not designed). This reflects two characteristics of the Bargerveen case: (a) more "improvisation" by the analyst herself (that is, the analyst relying on her ability to find appropriate structures for interactions in an *ad hoc* manner), and (b) stronger influences of political decisionmaking in the context of the policy analysis. The unplanned communicative interactions in which the analyst herself is not involved (the circles labeled e_i) show how the policy analysis is embedded in a policymaking process. The Bargerveen case shows that these "exogenous" interactions can strongly affect the design of the analysis, but also that the analyst can influence these interactions to some extent.

Adaptive design requires that the policy analyst monitors the policymaking process to assess what communicative interactions are most appropriate in view of the client's needs at different moments in time. The six dimensions of the hexagon model can be helpful in thinking about specific purposes and their relative importance, given the state of the policymaking process. The history of conflict between farmers and SBB led the analyst to consult with these key stakeholders in separate sessions to avoid that the discussion on policy objectives and options would be blurred by the friction. Once properly elicited, the two perspectives could then be used as reference points in subsequent sounding board group meetings. To establish the OGOR for nature, the analyst opted for this design: for want of authoritative scientific literature on the ideal conditions for peat growth, she assembled a team of experts and asked them to establish the "best available knowledge" (*research and analyze*) on this topic in a series of meetings



Legend:

QDA: *quality of debate and arguments* (consistency, richness and openness of arguments, etc.)
SQ: *scientific quality* (validity, reliability, etc.)
PR: *policy relevance* (usability, action orientation, etc.)
PE: *political effectiveness* (workability, feasibility, pro-activeness, personal goal achievement)
AL: *acceptance and learning* (sharing of perspectives, consensus, commitment)
DL: *democratic legitimacy* (openness, transparency, representation)

Fig. 5.9 Desired performance levels (changes in actors' minds) along the six dimensions of the hexagon model of policy analysis (Chap. 3) for three communicative interactions in the Bargerveen policymaking process

(multiple interactions 8 in Fig. 5.7). To establish the OGOR for agriculture, the analyst opted for a different design: she organized a series of "kitchen table talks" with small groups of farmers (multiple interactions 9 in Fig. 5.7) to be able to discuss—on their own "turf"—the specific conditions they required (*clarify values and arguments*). She asked the hydrologist to join these meetings so that possible measures for keeping the land dry could also be discussed (*design and recommend*). These talks provided her with the "building blocks" for drafting the OGOR for agriculture that was subsequently discussed in plenary meetings with the farmers (interactions 10 and 11 in Fig. 5.7).

These examples illustrate that, as was argued in Chap. 3, a policy analysis usually has to be "functional" in more than one dimension, and that specific interactions often need to be "multifunctional" as well. When designing a policy analysis, the purpose for the communicative interactions to be designed can be visualized by using the hexagon model, as in the diagram in Fig. 5.9. The axes correspond to qualitative indicators that can be used to evaluate the performance of each of the policy analysis functions (see the legend and Sect. 3.2 for an elaboration). The inner, solid-line hexagon symbolizes the current "state of mind" of the actors involved. The dashed-line hexagon represents the high end of a qualitative scale, and should be read as the extent to which the "best practice" would be able to change the minds of the actors involved. The center corresponds to the low end of this scale, and should be read as the result of the "worst practice". The thick, irregular polygon connects the points that on this scale indicate the *desired* "level of performance" for the policy analysis on each of the six dimensions of the hexagon model: it indicates the extent to which the communicative interaction that is being designed is supposed to change the client's mind (or, in the general case, the minds of specific actors).

Diagram (a) shows that during the design meeting (communicative interaction d3 in Fig. 5.6) for the first meeting of the "sounding board group" (subsequent interaction 6), the analysis team agreed that this meeting first and foremost should bring together all stakeholders and make them see that the GGOR process would provide a genuine opportunity for resolving the long-standing conflict about groundwater levels. The primary function of this meeting would, therefore, be to mediate among stakeholders. In addition, the meeting should enhance democratic legitimacy (aim: involve representatives of all stakeholder groups), the quality of the debate and arguments (aim: elicit all stakeholder perspectives), and political effectiveness (aim: ensure that all stakeholders commit to the process). The team chose a meeting format that would embody openness and inclusiveness. As the meeting agenda in Table 5.1 shows, the principal of the water board would open with a short formal speech to affirm the intention to find a shared solution. Working in a series of short parallel sessions in small groups (mixing stakeholder groups) would then stimulate social bonding among participants. Letting one reporter summarize what was discussed in his/her group would probably mean that these reporters would have to voice the views of others, which would stimulate appreciation for different perspectives. The facilitator would continuously encourage participants to contribute any potentially relevant pieces of information, including subjective views on the system. Contesting each other's contributions would be prohibited. The risk that this might compromise values of scientific quality and policy relevance was accepted. The shape of the irregular hexagon in Fig. 5.9a reflects these choices.

Diagram (b) in Fig. 5.9 shows that the modeling session with the hydrologists (communicative interaction 15 in Fig. 5.7) was designed with very different priorities in mind. At that stage in the process, the main objective was to establish whether the Microfem model was adequate for assessing whether a hydrological buffer zone would effectively raise the groundwater level in the Bargerveen while keeping the groundwater level in the area south of this buffer zone low enough for agricultural use. The modeling exercise (essentially a *design and recommend* type of activity) should enhance policy relevance (i.e., produce one or more feasible designs) and also acceptance and learning (i.e., convince both the farmers and SBB). The shape of the irregular hexagon in Fig. 5.9b also reflects that the limitations of the hydrological model had to be accepted.

Diagram in Fig. 5.9c shows the desired levels of performance for the meeting of the principals of the waterboard, the province, and the Ministry (communicative interaction e12 in Fig. 5.8). Here, the irregular hexagon shows that this meeting was designed to achieve agreement on a feasible solution. The analysis team prepared factsheets for several alternative water management plans (maps, summary of measures, and cost estimates), and placed the issue of funding as a crucial point on the agenda. In addition, the process manager briefed the water board principal about funds at the provincial and national level that were earmarked for the planned type of land use change. The risk that the format of a meeting "behind closed doors" might be perceived as undemocratic, thereby compromising acceptance of the outcome, was accepted.

Table 5.1 Detailed design of communicative interaction 6—the first formal stakeholder meeting in the Bargerveen process

Time	Topic	Process
8.00	Preparation	Hanging up maps, checking beamer etc.
8.30	Informal start	People arrive/coffee
9.00	Formal start	Welcoming speech by the principal of the water board
9.05	Introductions to the meeting	Short explication of logistics, purpose, and agenda Interactive clarification of expectations in small groups of four: your expectation for this workshop your involvement in the Bargerveen area Each group reports once (but the other persons in the group also get a chance to say their name and affiliation, and can add an expectation if it was forgotten)
9.30	GGOR and Natura 2000	Presentation about GGOR and Natura 2000 (20 min total) Questions of understanding (10 min): no discussion about GGOR/Natura 2000
10.00	Ongoing activities in the Bargerveen area	Presentation of activities that are going on in and around the Bargerveen (in relationship to the GGOR process: 15 min) Questions of understanding (10–15 min) Providing four "raw" maps showing all relevant activities and interests in the area presently known to the project team (5 min for explaining) Working in small groups to complete the maps (20 min)
11.00	Coffee break	
11.20	Reactions to GGOR/Natura 2000 + ongoing activities	Question to all: What are your hopes/fears for yourself/your institution with regard to the GGOR process, Natura 2000, and the ongoing activities? Will they give opportunities for you or your institution? Are you afraid they will bring problems/worries/uncertainties?
12.00	Activities	Presentation of the planned activities next 15 months (plan of approach: 10 min). Discussion and questions: what is missing, what has already been done, etc.
12.30	Forming "sounding board group"	Discussion about forming a "sounding board group" members and activities are groups missing? responsibilities?! Foundation of the "sounding board group" (if so decided) Checking of dates for next meeting(s)

Each of these specific examples reflects a tradeoff among objectives: give up some scientific rigor to keep key stakeholders on board, accept model limitations to get to acceptable solutions, and accept a low level of participation in the final

decisionmaking phase. What the diagrams in Fig. 5.9 do not show are the constraints on time and budget. Nevertheless, the analyst is often bound by such constraints. In both case examples, time pressure was relatively high. To effectively influence the next national health policy bill, the priority setting for focal public health areas had to be done in about 3 months' time. The Bargerveen process, begun in March 2006, was designed to meet the deadline of December 2007 that had been set for all GGORs concerning a Dutch Natura 2000 area. In the Bargerveen case, the policy analysis was at risk to being terminated when the water board refused to allocate additional resources for model development and at some point even suspended the activities of the analyst. In general, a policy analyst will have to work within the budget limits of her client, and she will often have to work against tight deadlines in order to synchronize with the political/administrative calendar. The fact that these constraints tend to change over time provides one more reason for adaptive design.

5.8 Conclusion

The purpose of this chapter was to show that a policy analyst can and should think as a designer. Policy analyses can be designed as artifacts, provided that the distinction between structure and flow is made. A well-designed policy analysis structures the flow of events in a dynamic policymaking process, but its capacity for doing so may be limited, especially when the policy context is unruly. We have argued that to make a meaningful contribution to this process, the design of a policy analysis as a whole needs to be adaptive. As such, the design-as-noun (policy analysis plan) must structure not only the policy analysis activities (interventions) but also the process of adaptation (decision rules for change).

The unruliness of policymaking processes entails that a policy analysis plan can specify in detail only the communicative interactions that will take place in the immediate future. Here, a design rationality focusing on means and ends is appropriate. Such rationality requires that the analyst is capable of assessing the needs of the client and other stakeholders, and of diagnosing the policy context so as to determine the proper "levels of performance" for the next communicative interactions. This diagnosis provides the set of goals by which alternative designs for the next communicative interaction can be judged. To generate different interactions, the analyst needs to have thorough knowledge of the tools of her trade (i.e., the large variety of approaches, methods, and tools that can be deployed in communicative interactions).

Design is a craft, not a science. In addition to a natural inclination toward pragmatic problem solving and a talent for coming up with creative solutions, it requires knowledge and skills that can be obtained in part through education, and in part through professional experience. As Walker and Fisher (1994) point out when they summarize what it takes to be a good policy analyst, it does not suffice to have good domain knowledge (e.g., in the field of natural science, social science, economics);

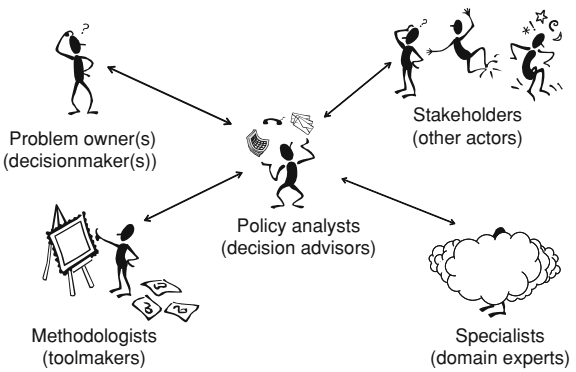


Fig. 5.10 The integrative role of the policy analyst

knowledge of human behavior—of culture—is just as crucial. To this we can add that—fortunately and reassuringly—a policy analyst need not be capable of performing all of the policy analysis activities, as long as she knows how to build, motivate, and direct an analysis team that, in combination, does have this capacity. Figure 5.10 graphically depicts this "spider-in-the-web" role of the policy analyst.

Moreover, a policy analyst should have a sharp "clinical eye", not only for the actors and their relations in the policy context, but also for the individuals and their relations within the analysis team. A policy analysis is first and foremost a series of communicative interactions aimed at changing people's minds, but often enough this requires touching people's hearts.

References

Bardach E (2000) A practical guide for policy analysis: the eightfold path to more effective problem solving. Seven Bridges Press New York

Bekebrede G (2010) Experiencing complexity: a gaming approach for understanding infrastructure systems. Next Generation Infrastructures Foundation Delft

Berendrecht WL, JJJC Snepvangers B. Minnema, and P.T.M. Vermeulen (2007). MIPWA: A Methodology for Interactive PlanningPlanning for Water Management, In: Oxley L, Kulasiri D (eds) MODSIM 2007 International congress on modelling and simulation. Modelling and Simulation Society of Australia and New Zealand, Canberra, pp 330–334

Bobrow DB, Dryzek JS (1987). Policy analysis by design. University of Pittsburgh Press, Pittsburgh

Bots PWG (2007) Design in socio-technical system development: three angles in a common framework. J Des Res 5(3):382–396

Bots PWG, Hulshof JAM (2000) Designing multi-criteria decision analysis processes for priority setting in health policy. J Multicriteria Decis Anal 9(1–3):56–75

Bots PWG, Bijlsma R, von Korff Y, van der Fluit N, Wolters H (2011) Supporting the constructive use of existing hydrological models in participatory settings: a set of "rules of the game". Ecol Soc 16(2):16

Briggs RO, de Vreede GJ, Nunamaker JF (2003) collaboration engineering with thinklets to pursue sustained success with group support systems. J Manag Inf Syst 19(4):31–63

Carton LJ (2007) Map making and map use in a multi-actor context: spatial visualizations and frame conflicts in regional policymaking in the Netherlands. Ph.D. Dissertation, Delft, Delft University of Technology
DeLeon P (1998) Models of policy discourse: insights versus prediction. Policy Studies J 26(1):147–161
Deutsch M, Coleman PT, Marcus EC (eds) (2006) The handbook of conflict resolution: theory and practice. Wiley, San Francisco
Dryzek JS (1990) Discursive democracy: politics, policy, and political science. Cambridge University Press, Cambridge
Dunn WN (1994) Public policy analysis: an introduction (2nd edn). Prentice Hall, Englewood Cliffs
Ehrgott M, Figuera JR, Greco S (eds) (2010) Trends in multiple criteria decision analysis. Springer, Berlin
Fischer F, Forester J (1993) The argumentative turn in policy analysis and planning. Duke University Press, Durham
FOCS (1993) Financieel Overzicht Zorg 1994 [Financial overview of the care sector 1994], Tweede Kamer 23407. SDU Publishing (in Dutch), The Hague
Habermas J (1984) The theory of communicative action, volume I: reason and the rationalization of society. Beacon Press, Boston
Healy P (2005) Network complexity and the imaginative power of strategic spatial planning, In: Albrechts L, Mandelbaum SJ (eds) The network society: a new context for planning?. Routledge, Abingdon, pp 146–160
Hemker K, van den Berg E, Bakker M (2004) Ground water whirls. Ground Water 42(2):234–242
Hoppe R (1999) Policy analysis, science, and politics: from 'speaking truth to power' to 'making sense together'. Sci Public Policy 26(3):201–210
Keen PGW (1980) Adaptive design for decision support systems. Data Base 12(1–2):16–25
Kolfschoten GL, Briggs RO, De Vreede GJ, Jacobs PHM, Appelman JH (2006) A conceptual foundation of the thinklet concept for collaboration engineering. Int J Hum Comput Stud 64(7):611–621
Knott J, Wildavsky A (1980) If dissemination is the solution, what is the problem?. Knowledge: creation, diffusion, utilization 1(3):537–578
Landry R, Lamari M, Amara N (2003) The extent and determinants of the utilization of university research in government agencies. Public Adm Rev 63(2):192–205
Lewicki RJ, Weiss SE, Lewin D (1992) Models of conflict, negotiation and third party intervention: a review and synthesis. J Organ Behav 13(3):209–252
Lootsma FA (1999) Multi-criteria decision analysis via ratio and difference judgement. Kluwer Academic Publishers, Deventer
May PJ (1992) Policy learning and failure. J Public Policy 12(4):331–354
Mayer IS, van Daalen CE, Bots PWG (2004). Perspectives on policy analyses: a framework for understanding and design. Int J Technol, Policy Manag 4(2):169–191
MacRae D Jr, Whittington D (1997) Expert advice for policy choice: analysis and discourse. Georgetown University Press, Washington
Miser HJ, Quade ES (1985) Handbook of systems analysis: overview of uses, procedures, applications and. practice. Elsevier, Amsterdam
Miser HJ, Quade ES (1988) Handbook of Systems Analysis: Craft issues and procedural choices. Elsevier, Amsterdam
Mu R, de Jong WM, ten Heuvelhof EF (2010) A typology of strategic behaviour in PPPs for expressways: lessons from china and implications for Europe. Eur J Transport Infrastruct Res 10(1):42–62
Nagel SS (1988) Policy studies: integration and evaluation. Praeger Publishers, New York
Pan Z, Kosicki GM (2001) Framing as a strategic action in public deliberation. In: Reese SD, Gandy OH, Grant AE (eds) Framing public life: perspectives on media and our understanding of the Social World. Lawrence Earlbaum, Mahwah, pp 35–66
Patton CV, Sawicki DS (1986) Basic methods of policy analysis and planning. Prentice Hall, Englewood Cliffs

Roe EM (1994) *Narrative PolicyPolicy AnalysisAnalysis: Theory and Practice*. Durham/London: Duke University Press
Ropohl G (1999) Philosophy of socio-technical systems. J Society Philos Technol 4(3):59–71
Rotmans J, Kemp R, van Asselt M (2001) More evolution than revolution: transition management in public policy. Foresight 3(1):15–31
Ruwaard D (1994) Public health status and forecasts: the health status of the Dutch population over the period 1950–2010. National Institute of Public Health and Environmental Protection, The Hague, SDU Publishing (in Dutch)
Schelling TC (1960) The strategy of conflict. Harvard University Press, Cambridge
Schneider A, Ingram H (1988) Systematically pinching ideas: a comparative approach to policy design. J Public Policy 8(1):61–80
Sidney MS (2007) Policy formulation: design and tools. In: Fischer F, Miller GJ, Sidney MS (eds) Handbook of public policy analysis: theory, politics, and methods. CRC Press, Boca Raton, pp 79–88
Simon HA (1981) The sciences of the artificial (2nd edition). The MIT Press, Cambridge, MA
Smith GF, Browne GJ (1993) Conceptual foundations of design problem solving. IEEE Trans Syst, Man Cybern 23(5):1209–1219
Susskind L, Jain RK, Martyniuk AO (2001) Better environmental policy studies: how to design and conduct more effective analyses. Island Press, Washington
Torgerson D (2003) Democracy through policy discourse. In: Hajer MA, Wagenaar H (eds) Deliberative policy analysis: understanding governance in the network society. Cambridge University Press, Cambridge, pp 113–138
VWS (1995) Ministerie van volksgezondheid, Welzijn en Sport. *Nota Gezond en Wel. Volksgezondheidsbeleid 1995–1998*. Tweede Kamer 24126 (1). SDU Publishing (in Dutch), The Hague
Walker WE (1988) Generating and screening alternatives. In: Miser HJ, Quade ES (eds) Handbook of systems analysis: craft issues and procedural choices. Elsevier, Amsterdam
Walker WE, Fisher GH (1994). Public Policy Analysis: a brief definition. RAND Paper P-7856. RAND Corporation, Santa Monica
Walsh JP, Fahey L (1986) The role of negotiated belief structures in strategy making, J Manag 12(3):325–338
Webler T (1995) "Right" discourse in citizen participation—an evaluative yardstick. In: Renn O, WeblerT, Wiedemann PM (eds.) Fairness and competence in citizen participation—evaluating models for environmental discourse. Kluwer Academic Publishers, Dordrecht, pp 35–86
Wildavsky A (1987) Speaking truth to power: the art and craft of policy analysis (2nd edn). Transaction Publishers, New Brunswick
Young HP (2005) Strategic learning and its limits. Oxford University Press, Oxford