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The Role of Feedback in the Creation of Useful Knowledge

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Mary Ann Von Glinow
University of Southern California

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Center for Effective Organizations - School of Business Administration
University of Southern California - Los Angeles, CA 90089-1421 (213)740-9814

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ABSTRACT

Practical usefulness or relevance of the knowledge produced in academic settings has become an issue of growing concern in recent years. We argue that feedback can be an important means of making academic research more relevant to practitioner needs. We propose a three-phase feedback process model and have illustrated its applicability in an academic setting by integrating usefulness concerns into the knowledge creation process. Since the impact of feedback can be affected by the institutional context, some key institutional factors influencing usefulness of academic research are noted.

INTRODUCTION

A theme of growing concern in recent years has been the seeming lack of relevance or usefulness characterizing much of the research produced in academic settings (Thomas & Tymon, 1982). Generally, the problem of relevance has been considered to be rooted in the guiding philosophy of current scientific research. Under the positivist assumptions that are the foundation of the natural science model of research, theoretical refinements and methodological rigor have been continually over-emphasized while the questions about real-word application have been frequently ignored (Susman & Evered, 1978; Mitroff & Pondy, 1978). More recently, efforts have been made to increase the usefulness of scientific research by understanding and improving the knowledge utilization process (Larsen, 1981; Kilman, 1979). However, neither the "guiding philosophy" framework, nor the "knowledge utilization" framework has addressed the issue of making research more useful by shaping the process of its generation by the researcher.

Our intention here is to examine carefully how usefulness or relevance can be integrated into the knowledge creation process. More specifically, we propose that feedback can be a valuable means of helping researchers make their work more useful to practitioners. Toward that end, we outline the characteristics of an effective feedback process model based on the empirical research (see Appendix for a brief description of this research), and discuss the implications of this model for using feedback in academic research settings to produce useful knowledge. Finally, we take note of certain institutional factors that can serve as additional means of fostering the creation of useful knowledge.

Defining Useful Knowledge

Before we can discuss the ways in which feedback can improve the usefulness of knowledge, it is necessary to define what constitutes "useful" knowledge. Within the organizational sciences a recent operationalization of the "usefulness" concept by Thomas and Tymon (1982) seems most promising. After examining the major criticisms of the practical usefulness of academic research they propose five criteria for assessing the usefulness or relevance of theories or findings for practitioners. These criteria are:

(1) Descriptive Relevance: "refers to the accuracy of research findings in capturing phenomena encountered by the practitioner in his or her organizational setting" (p. 346). Academic research often concentrates on internal validity, while ignoring the issue of external validity; it also tends to be over-simplified and unappreciative of phenomena that are less immediately observable. Research can be made more relevant if it demonstrates better external validity and better reflects the complexity and intricacies of organizational settings.

(2) Goal Relevance: "refers to the correspondence of outcome (or dependent) variables in a theory to the things the practitioner wishes to influence" (p. 347). If we note the basic/applied distinction, most academic researchers have concentrated on basic rather than applied problems.

(3) Operational Validity: "concerns the ability of the practitioner to implement action implications of a theory by manipulating its causal or independent variables" (p. 348). For research to be relevant, variables addressed by it must be controllable by practi-

tioners. Moreover, these variables should represent concrete rather than abstract factors that can be changed or influenced in some way.

(4) Non-obviousness: "refers to the degree to which a theory meets or exceeds the complexity of 'common sense' theory already used by the practitioners" (p. 349). Academic concerns of demonstrating the truth of hypotheses often lead to oversimplified formulations that do not offer fresh insights for practitioners. But to be useful, research should offer improvement over models being currently relied upon by the practitioner.

(5) Timeliness: "concerns the requirement that a theory be available to practitioners in time to use it to deal with problems" (p. 349). Unlike scientists, practitioners cannot and will not wait for all the facts to be in before decision making occurs. In addition, situational determinants and behaviors can change dramatically over time.

Using these five dimensions as an operational definition of useful knowledge the importance of feedback in creation of such knowledge can now be discussed.

Feedback as a Strategy for Creating Useful Knowledge

An obvious implication of the above criteria is that researchers must have a keen awareness of practitioner needs in order to produce useful knowledge. Thomas and Tymon (1982) themselves state that "the dimensions of relevance presented here are concerned with the external relationship between a study's findings and practitioners' needs" (p. 350).

An important means of heightening researcher awareness of practitioner needs and strengthening the relationship between research and practice is feedback to researchers on the practical relevance of their

work. This feedback can come either directly from practitioners (or other potential users such as clients or beneficiaries) or indirectly from other researchers who have studied practitioner needs. This is in line with recommendations made by Thomas and Tymon who suggest two complimentary strategies for making organizational science research more useful: "The first is to encourage studies that attempt to provide information about these aspects of the practitioner's situation to other researchers -- in Argyris' (1980) words, to inform the field of the 'ecological context' within which the practitioner operates... The second strategy is to involve practitioners in <u>feedback</u> and <u>review processes</u>" (p. 350, emphasis is ours).

From the above discussion it follows that feedback can be a very appropriate means of aiding the creation of useful knowledge. Although virtually no empirical studies are available at the present time to demonstrate the validity of this assertion, many well-established findings from the current literature on feedback do provide support for our assertion that feedback can be used advantageously in this context.

Feedback provides information to individuals about their performance. In this capacity, its two basic functions are of <u>directing</u> and <u>motivating</u> performance (Annett, 1969; Ilgen, Fisher & Taylor, 1979; Nadler, 1979; O'Reilly & Anderson, 1980; Lawler, 1976). In its directive function, feedback keeps goal directed behavior on course. That is, it serves as an error detection device and therefore as a stimulus to begin problem identification and solution (Nadler, 1979). Or, as Lawler (1976) observes, it gives the individual the information that is needed in order to correct his or her behavior when it deviates from the standard or desired behavior. In its motivational function,

feedback stimulates greater effort by the individual, and makes it possible for the individual to exercise self-control (Lawler, 1976).

Thus, for those researchers who are concerned about practical relevance of their work (though there are many, particularly in academia for whom this is not the highest priority (Kilman, 1979)) feedback can serve to guide their work closer to user needs and also enhance their motivation and sense of self-control. This last point is noteworthy for autonomy is always highly prized by professionals (Von Glinow, 1982) and even more so by academicians. Academicians need to know that they themselves retain control over their actions and their sense of professional freedom is not compromised.

In the following section we present a process model of feedback and discuss the factors that determine the effectiveness of this feedback process.

EFFECTIVE FEEDBACK: A THREE-PHASE PROCESS MODEL

Effectiveness of feedback has usually been assessed and demonstrated in terms of the outcomes resulting from the way it is utilized by the recipient. Typical outcomes are increased recipient motivation, altered recipient actions, or tangible gains in the recipient's output. However, the impact of feedback occurs through a complex information exchange process where a source communicates a message to a recipient about his/her performance or task related attitudes and behaviors, which in turn leads to certain outcomes. Thus, if we wish to understand the effectiveness characteristics of feedback as a process, then we must concern ourselves not merely with a post facto evaluation of its outcomes, but also with factors that determine the likelihood that any impact, and therefore outcome, will occur.

The criteria that govern the likelihood of feedback having some impact fall into two broad categories: Acceptability of feedback for the recipient, and Usability of the feedback for the recipient. Acceptability concerns factors which influence the recipient to pay attention to the feedback and regard it as a basis for future action. Usability deals with factors that make it easier or more difficult for the recipient to use the feedback or act in response to it (assuming the recipient has previously accepted the feedback). Once acceptability and usability factors have been taken into account we can then analyze the outcomes of the feedback for their desirability. Thus, in practice, effectiveness of feedback is a broader question encompassing the acceptability, usability and outcomes of feedback.

Based on the above, it may be helpful to consider the effectiveness of feedback as a three-phase process or impact. The first phase, which follows the feedback event most immediately, is the Acceptance phase. Here, the recipient arrives at a basic judgment to either accept or reject the feedback information. This acceptance or rejection is greatly influenced by certain characteristics of the source, of the recipient himself/herself, and of the feedback message. If the feedback is accepted by the recipient, then the next phase involves deciding on a plan of action, or Action Planning, in response to the feedback. During this second phase, usability of feedback is of primary concern. The final phase is of feedback Utilization where consequences or outcomes of the feedback take shape according to the way feedback information is utilized by the recipient. This basic model depicting the three phases

of the feedback process is shown in Figure 1. The central issues in

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Insert Figure 1 about here

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each of the three phases above will be identified and discussed in detail now.

Acceptance Phase of the Feedback Process

Ilgen et al. (1979) suggest that "Acceptance refers to the recipient's belief that the feedback is an accurate portrayal of his performance. Whether or not this belief is correct is inconsequential to acceptance" (p. 356). To the extent this definition relies solely on the recipient's belief regarding accuracy of feedback, it appears to be too narrow. In the model proposed here, acceptance signifies the recipient's inclination to pay attention to the particular task-related behavior. As previously mentioned, acceptance of feedback is greatly influenced by characteristics of the source, of the recipient, and of the feedback message.

Characteristics of the Source. Sources of feedback can be classified into three categories: Interpersonal, Task, and Self. Interpersonal sources are other individuals who have observed the recipient's performance and are in a position to evaluate it. This source category includes supervisors, co-workers, subordinates, and others such as clients or professional colleagues who may not be actually members of the recipient's organization. Task can be a source of feedback as it reaches a certain stage of completion or moves in certain directions. Finally, individuals may be able to judge their own performance and therefore serve as their own source of feedback. In the present discussion we deal only with interpersonal sources of feedback as they

ultimately influence the knowledge creation process. Current research findings suggest credibility and power as the two most significant characteristics of interpersonal sources.

(1) Source Credibility. Ilgen et. al (1979) have viewed credibility of source as a major factor influencing acceptance of the feedback and have identified two basic determinants of it: expertise and trustworthiness of the source. These authors suggest that expertise should include familiarity with the task itself as well as the recipient's task performance. As for trustworthiness, credibility of a source will be higher if the recipient finds the source non-threatening and has trust in the source's motives. O'Reilly and Anderson (1980) have also emphasized the importance of trust in the feedback process. Giffin (1967) identified expertise and intentions toward the listener (what we have called trust) along with reliability, dynamism (boldness, energy) and personal attractiveness as dimensions of source credibility in the communication process. In our study (see Appendix) sources of useful feedback are characterized as knowledgeable, well-informed, respected, etc. -- suggesting the expertise qualities. Sources are also seen as concerned or well-meaning, understanding, honest, open, self-possessed, non-condescending, etc.--suggesting the trustworthiness dimension.

Source credibility may be influenced by two additional factors: interdependence between the source and the recipient, and proximity of the source to the recipient. Source-recipient interdependence suggests that the performance of either may affect the performance of and/or valued outcomes for the other, whereas usually the recipient only is dependent on the source. Ilgen, Mitchell, and Fredrickson (1981) have

found that the supervisors whose own rewards are partially dependent upon the level of performance of their subordinates will respond in a more positive and helpful manner toward their subordinates when they fail to perform as well as the supervisor would like. Thus, if sources in interdependent situations are more likely to show helping and facilitating behaviors, then their own credibility and consequently the acceptability of the feedback provided by them, is likely to be higher.

Source-recipient proximity can be physical, but of greater relevance is the psychological proximity, or "psychological closeness" as discussed by Greller and Herold (1975). Their findings indicate a greater reliance on intrinsic sources -- those psychologically "closer" to the individual -- than on more external sources for feedback information. However, these authors also point out that "distance" may moderate the reliance on various "secondary" sources (such as co-workers) but not the reliance on a "primary" source like the supervisor.

(2) Source Power. In addition to credibility, a basic source characteristic is power. Power based upon expertise is indirectly implied in the discussion of source credibility; however, power also derives from the actual or assumed authority to administer rewards and punishments. Such power can be unrelated to a source's credibility, i.e., expertise and trustworthiness. Ilgen et al. (1979) observe that "theoretically power is independent of credibility, although we should hope that in many settings they co-vary" (p. 351). These authors also suggest that "other things being equal, the higher the power of the source, the more likely the recipient is to attempt to respond in line with feedback" (p. 351). Kerr and Slocum (1981) also note that feedback

will have easier acceptance if the recipient perceives the source as a controller of important rewards and sanctions.

To summarize, feedback acceptance is influenced to a considerable degree by credibility and power of the source. The existing literature defines credibility largely in terms of expertise (including power derived from expertise) and trustworthiness of the source. Some of these studies suggest consideration of source-recipient interdependence and psychological proximity as additional factors contributing to source credibility. Finally, power stemming from the source's control of rewards and sanctions may also significantly influence the acceptance of feedback.

Characteristics of the Recipient. Acceptance of feedback is governed not only by characteristics of the source, but by the recipient's own characteristics as well. The most relevant categories of recipient characteristics have been found to be recipient capability to respond, and individual differences.

(1) Capability to Respond. A recipient is more likely to accept feedback if (s)he finds it possible to respond to the demands of the feedback. If, however, the feedback recommends actions which the recipient does not believe himself or herself capable of taking, or requires skills which the individual neither possesses nor can hope to acquire easily, then it is unlikely that the feedback will be accepted readily. Expectancy theory (Vroom, 1964) makes it clear that beliefs about response capabilities are prerequisites to expenditure of effort in a performance situation. On this basis Ilgen et al. (1979) have argued that a recipient's belief in the effort-performance relationship should influence his or her desire to respond to the feedback. Heider

(1958) has observed that ability and willingness to perform are not independent of one another; one's ability to perform a task often increases one's desire to do so. In our study (see Appendix) some of the respondents commented that useful feedback dealt with matters over which they had some degree of control.

(2) Individual Differences. Different personality types have different needs and expectations in the performance context, and hence they would differ in their reactions to any given feedback. Personality variables that have usually been studied in work settings include locus of control, self-esteem, and need for achievement (n Ach). On the basis of Rotter's (1966) research on Internal-External locus of control, Baron, Cowan, and Ganz (1974) found that internals responded more to feedback from the task itself while externals responded more to feedback from others. Weiss (1977) examined the influence of self-esteem in subordinates' tendency to model their own behavior after the behavior of their supervisors. He found that subordinates with high self-esteem modeled the behavior of their supervisors less, which suggests that individuals with high self-esteem might be less receptive to feedback from others. Individuals high on n Ach characteristically have a strong desire to know how well they are doing, and hence they are likely to be more attentive to feedback. Since our focus here is on interpersonal (external) feedback, individuals with an external locus of control or high need for achievement might be expected to have a greater acceptance of this type of feedback, whereas those with high self-esteem might be expected to have a lower acceptance for it.

Characteristics of the Feedback Message. Characteristics of the feedback message can be discussed more meaningfully under the Action

Planning phase of the model proposed here. However, some message characteristics are more pertinent to feedback acceptance. For a better understanding of the role of the feedback message in the overall process model, a distinction between the content and context aspects of feedback is necessary. Content refers to specific qualities of the message that is communicated by the source to the recipient. Context refers to the conditions under which the message is communicated. Content and context of feedback can make it critical for the recipient and hence increase the likelihood of its acceptance.

(1) Content Criticality. Acceptance of a message will be higher if it is viewed by the recipient as important. If the feedback is largely trivial with no material consequence, it is unlikely that the recipient will consider it seriously for future action. Respondent comments in our study supported this reasoning about importance or relevance of the feedback message. Another factor that influences criticality, and therefore acceptance, of feedback on the basis of its content is information value of the message. If the recipient is to take some specific action in response to the feedback, the information provided by the feedback should be more extensive than the information the individual currently possess. Annett (1969) suggests that if the feedback is to augment the recipient's desire to respond, its informational content should not be redundant with information already known by the individual. Nadler et al. (1976) also state that an effective feedback system should increase information available to employees. We should note here that the recipient's own expertise and/or experience with respect to the task on hand can also determine the information value of feedback.

(2) Context Criticality. Apart from the content of the feedback, criticality and, therefore, acceptance, can be influenced by the contextual conditions in which feedback occurs. If other opportunities for feedback--from the same or different sources--are considered rare, the feedback may be more acceptable. Similarly, if other sources of feedback are not available, the offered feedback might be judged as more critical and be accepted more readily.

Action Planning Phase of the Feedback Process

Once feedback has been accepted by the recipient, the next step is to decide upon a specific plan of action in response to the feedback. In this phase of the feedback process the key issue is usability of the feedback for the recipient, which determines the likelihood as well as promptness of his/her response.

Usability of the Feedback. As mentioned, usability refers to the factors that make it easier or more difficult for a recipient to use the feedback or act in response to it. From the available literature and our preliminary data four factors emerge as the key determinants of feedback usability: validity, specificity, consistency, and timeliness of feedback information. Validity and specificity characterize the content of the feedback. Consistency and timeliness pertain to the context of the feedback.

(1) Validity of the Feedback. Feedback about the recipient's actions or behaviors will be perceived as valid if the actions or behaviors referred to are considered relevant to task performance. Similarly, feedback about performance outcomes will be judged valid if it relates to legitimate performance criteria. Feedback, even if unfavorable or critical, can be seen as a proper basis for guiding

future action to the extent it is perceived to be valid, accurate and realistic.

(2) Specificity of the Feedback. As Ilgen et. al (1979) have observed, feedback that is specific and detailed allows for setting specific goals; specific goals have consistently been found superior to general goals for bringing about improvement in performance. Kerr and Slocum (1981) also support this position.

(3) Consistency of the Feedback. There is considerable support in the literature for the importance of consistency of feedback (Ilgen et al., 1979; Kerr & Slocum, 1981). Consistency of feedback means that feedback from different sources, or from the same source at different points of time, has a coherent pattern with non-contradictory action-implications. It is difficult for a recipient to meaningfully use inconsistent or contradictory feedback information.

(4) Timeliness of the Feedback. Timeliness has two distinct meanings. If the purpose of the feedback is to bring about corrective action, the feedback should be given while it is still possible to correct the error. If however, the purpose of the feedback is to reinforce a desired behavior, or discourage an undesired behavior, the feedback should be given while the behavior is still salient for the recipient. Ilgen et al. (1979), Kerr Slocum (1981), Nadler, Mirvis and Cammann (1976), and Nadler (1977) have all emphasized the importance of the timeliness element.

To summarize, we find that feedback will be more usable in the Action Planning phase if it is perceived to be valid, specific, has a consistent pattern, and is received in a timely manner.

Utilization Phase of the Feedback Process

If feedback has been found acceptable and usable by the recipient then (s)he is likely to utilize the feedback information to make appropriate changes in his/her performance. The spheres within which changes occur and the extent of these changes are the outcomes of the feedback process. These outcomes serve as the final criteria of feedback effectiveness.

Outcomes of the Feedback. Changes in task performance, i.e., quantity and/or quality of tangible output, constitute the outcomes of feedback that have been receiving maximum attention from researchers and practitioners alike. We may refer to such outcomes as the output or performance outcomes of feedback. Strong empirical support is available for the claim that feedback can improve performance outcomes (c.f. O'Reilly & Anderson, 1980; Erez, 1977; Seligman & Darley, 1977; Becker, 1978).

There are other important areas too in which feedback leads to desirable changes. These changes contribute directly or indirectly to the recipient's tangible output or performance, and therefore, may be referred to as instrumental outcomes. Four key instrumental outcomes or functions of feedback are: direction, motivation, development, and climate-shaping. These outcomes are discussed in some detail below.

(1) Direction. In its directive or cue function, feedback can bring about error correction, role clarification and goal adjustment (Annett, 1969; Ilgen et al., 1979; Nadler, 1979). For example, feedback may point out an error in the design of a piece of equipment, and may call for components of different specifications to be used. Similarly, feedback may direct behavior by clarifying roles for organizational

incumbents and offering prescriptions for future action. In addition, feedback may direct attention to adjusting goals subject to new constraints.

(2) Motivation. Much has been written about motivation stemming from feedback in organizational settings (Locke, Cartledge & Koeppel, 1968; Annette, 1969; Nadler, 1977; Ilgen et al., 1979; Kerr & Slocum, 1981). Similarly, effort has been studied within the expectancy framework (Vroom, 1964). Feedback aids intrinsic motivation by enabling a recipient to judge his or her performance and feel a sense of competence on this basis (Hackman & Oldham, 1976).

(3) Development. Feedback can be instrumental in bringing about new learning or new self-awareness to the recipient. This function as well as the climate-shaping function has thus far received inadequate research attention. Research on the learning function however (c.f. Annett, 1969; Nadler, 1979) covers many issues that are relevant to the development function.

(4) Climate-shaping. Feedback can lead to a high-trust environment by contributing to increased mutual respect between the recipient and the feedback sources. Direct empirical support for this claim is not available at the present time, however the extensive literature on the feedback-satisfaction linkage (Ivancevich, 1972; Steers, 1976; Erez, 1977; Strang, Lawrence & Fowler, 1978) is suggestive of the possibilities.

To summarize, the utilization phase is the last phase in the three-phase feedback process presented here. In this phase outcomes of the feedback take shape, and these outcomes serve as the final (though not the sole) criteria for assessing feedback effectiveness. The ultimate

outcomes are output or performance outcomes, but also of importance are the four instrumental outcomes which were identified and discussed.

Effective Feedback: A Three-Phase Process

Figure 2 depicts the three-phase feedback process in its entirety.

Insert Figure 2 about here

We have argued that existing research has frequently concentrated on the outcomes of feedback without paying sufficient attention to the acceptability and usability dimensions. The utilization phase has been emphasized much more than the preceding phases of acceptance and action-planning. Therefore, effectiveness of feedback can be rated solely on the basis of the outcomes, but it cannot be improved without fully taking ability and usability into account.

In the following section we discuss implications of the proposed model for creating useful knowledge in academic settings.

APPLICATION OF THE FEEDBACK PROCESS MODEL IN ACADEMIC RESEARCH SETTINGS

Having discussed the key components of effective feedback, we now turn our attention to the application of these concepts to the knowledge creation process. Specifically, the following section demonstrates how the feedback process can be applied to researchers in academic settings for the purpose of helping them create useful knowledge.

Acceptance of Feedback in Academic Settings

Acceptance of feedback has been shown to be influenced by characteristics of the source, the recipient, and the feedback message. The significance of each of these characteristics in academic settings warrants discussion.

Source Characteristics. As previously mentioned, credibility and power have been identified as two basic source characteristics which affect the acceptability of feedback in our model. Of the two, power appears to be less important in academic settings because (1) values of academic freedom and professional responsibility substitutes for hierarchical power as a means of control and influence; and (2) under the peer-controlled reward system, power is somewhat diffuse -- usually, no single individual has the authority to make a final judgment on the work of an academic professional.

Credibility, on the other hand, is inherently important in academic settings. Specialized knowledge and disinterestedness (or impartiality) are highly valued by the academic community. Therefore, expertise and trustworthiness of the source of feedback are likely to be critical factors for academic researchers. Interdependence and proximity, two other factors in credibility, are also relevant because they permit an easier assessment of source expertise, and enhance trustworthiness.

These arguments suggest that colleagues who have familiarity with practitioner needs are in a privileged position to provide acceptable feedback as they are likely to be high on all the four dimensions of credibility. If feedback is to come from an outside source, however, the individual should have adequate expertise based on qualification and experience, and should be seen as being trustworthy. Besides, if it was possible for the researcher to have a close, ongoing contact with the outside source, the resulting interdependence and proximity would also contribute to acceptable feedback.

Recipient Characteristics. While skills and abilities are important aspects of one's capability to respond, ethical standards and

professional norms have also been shown to influence the way in which an academic is capable of responding. Another relevant factor here is the limitations of the theories and models used by the researcher. These limitations represent boundaries within which the researcher must operate and as such, are "role" limitations which circumscribe one's capability to respond. For example, it may be relatively easy for a researcher to introduce additional variables in a model in response to practitioner needs, but it may be difficult for a researcher to obtain the high levels of certainty a practitioner might desire. Similarly, ethical and professional considerations may preclude certain types of research which might otherwise be easy to carry out (Von Glinow, 1982; Kerr, Von Glinow & Schriesheim, 1977). Such factors influence the acceptability of feedback offered to a researcher.

Acceptance of feedback also depends on individual differences. There are considerable variations in value- and behavioral- orientations of scientific researchers (cf., Friedlander, 1971; Eiduson & Beckman, 1973; Sethia, 1980). Moreover, these orientations are susceptible to changes in professional career and personal life (Cotogrove & Box, 1970; Barnes, 1971). These value- and behavioral-orientations have substantial bearing on the type and scope of work that different researchers prefer and this influences their receptivity to various types and sources of feedback.

Feedback Message Characteristics. Feedback content will be critical to an academic researcher if it offers information not known by the researcher, and if the feedback deals with important issues. Practitioner feedback is more likely to contain valued information if it is about practical application of the researcher's work than if it is

about theoretical or methodological issues. Similarly, feedback that relates to important questions about the applicability of a theory or model will be more acceptable than one that relates to minor problems of application in a special setting.

The context within which the feedback occurs also affects the likelihood of acceptance. If opportunities for practitioner feedback are severely limited due to the number of practitioners with whom the researcher has contacts, or due to the frequency with which the researcher is able to interact with the practitioners, then feedback is likely to be accepted more readily. But if opportunities for practitioner feedback are plentiful, then any feedback offered will be more selectively accepted.

Usability of Feedback in Academic Settings

In general, feedback is more usable (or easier to act upon) if it is seen as valid, specific, consistent and timely. Feedback on specific research will be seen as valid if it pertains to variables, relationships, or problems which the research purports to deal with. Extraneous observations, even those of merit, cannot help the researcher very easily. Similarly, feedback which points out specific strengths or weaknesses of the research is more usable than feedback which is indirect and general. If a researcher receives consistent feedback from different sources (various colleagues, practitioners, or users), or if successive feedbacks offered by the same source are consistent then it may be easier for the researcher to respond appropriately. Inconsistent or contradictory feedback, however, is difficult to respond to. Timeliness of feedback also determines its usability. If colleagues or practitioners point out a weakness in the research design after the data

collection is completed, the researcher will undoubtedly derive little immediate benefit from such information.

Outcomes of Feedback in Academic Settings

Acceptance and usability of feedback are important because they are expected to lead to desired outcomes. The ultimate outcome desired in the present context is the creation of knowledge that is useful to practitioners and other users or beneficiaries. Quantity and quality of useful knowledge produced is the "performance" facet of outcome in the proposed model. There is also the "instrumental" facet of outcome made up of factors that are not the ultimate desired outcomes, but directly or indirectly contribute to it. These factors include direction, motivation, development and climate-shaping. We will now discuss the role of feedback in bringing about these instrumental and performance outcomes.

In its directing function feedback enables a researcher to know where or how his/her work diverges from the course it needs to follow if it is to be useful for practitioners. Feedback for this purpose can provide information about specific variables and relationships that need to be explored. In its motivational function, feedback can result in increased effort to meet the usefulness criteria. This increased effort may be the result of a realistic assessment of the adequacy or inadequacy of the research effort, and may also arise from a sense of competence. In its developmental function, feedback can bring about new learning by challenging a researcher to solve some pressing practical problem. Feedback can also directly cause new learning to occur by offering important new information to a researcher. Lastly, the climate-shaping function of feedback creates relationships between a

researcher and various sources of feedback that would be characterized by a high level of interaction and greater receptivity to each other's needs.

Thus, the occurrence of instrumental outcomes implies:

- high degree of interaction and trust between the researcher and the feedback sources (climate-shaping function);
- the researcher getting necessary information on user situation and priorities (directive function);
- the researcher being motivated to address user problems and concentrate his/her efforts on creating useful knowledge (motivational function); and
- the researcher being able to learn, change and grow to meet the challenge of user problems in ways consistent with his/her professional commitments (developmental function).

And if these instrumental outcomes occur, it would be reasonable to expect that the desired performance outcome of useful research will follow.

Even though our aim here has been to examine the role of feedback in helping researchers produce useful knowledge, researcher efforts are guided also by the institutional context. Although a detailed discussion of the institutional factors is beyond the scope of this paper, the relevance of a few important factors is suggested in the next section.

INSTITUTIONAL FACTORS AFFECTING THE CREATION OF USEFUL KNOWLEDGE

Although the feedback process model can be used to promote researcher success in the production of useful knowledge, institutional factors exist which clearly mitigate against this goal. The first factor pertains to the organizational evaluation and reward system. Since the publication of one's research is one of the few relatively objective means by which performance is evaluated in academic settings, the organization's evaluation and reward system can be used as part of the feedback process to enhance research relevance. This suggests that organizations need to be able to define, measure, reward and give feedback (Kerr, 1975) on research relevance as part of the evaluation of an academic's performance.

It follows therefore that a second institutional factor which influences the creation of useful research involves feedback sources. Typically, it is the administrators in academic settings who make decisions on retention, promotion, and tenure. As part of an effective feedback process, alternate sources may be utilized to judge the relevance of an academic's performance. Alternate sources rendering input could include outsiders (e.g., practitioners having direct contact with the researcher), colleagues and peers. Much has been written about peer appraisals and their increased likelihood of acceptance by professionals (Von Glinow, 1982; Kerr, Von Glinow & Schriesheim, 1977) over hierarchical appraisal systems (Von Glinow & Novelli, 1982). Thus, alternate feedback sources have been found to increase the academic professional's acceptance of the feedback content. It seems likely that

such sources could give feedback on the relevance of the knowledge produced.

A third institutional factor influencing the creation of useful knowledge is the institution's willingness to support and encourage via the reward system, the involvement of the researcher with the client/user on implementation of the knowledge s(he) has created. Frequently institutional forces argue against academics' involvement with clients, for as Thomas and Tymon (1982) suggest, such involvement is viewed as less prestigious by the organization, and in some cases, by the researcher as well.

However, in aiding the creation of useful knowledge, organizations might begin to reexamine their posture vis-a-vis involvement of researchers with users. In fact, organizations might create opportunities for researchers to interface directly with users. With few exceptions, academic institutions have not proactively sought to enhance the creation of useful knowledge by increasing involvement with users. Such a position would be advantageous for the academic institution in that potential symbiotic relationships which can be mutually advantageous would be expected to occur (e.g., academic institutions would supply useful/relevant research to users, who would actively support such research projects in their own settings. Similarly, academicians could sit as advisors to the Boards of Directors and practitioners could serve on academic research boards). This type of involvement might be more time consuming than is normally seen, which in turn argues for expanded institutional evaluational tools for long-term research efforts.

In summary, support from the academic institution is also a key factor in shaping the academic's performance in producing useful

knowledge. Toward that end, the organization can begin to evaluate and reward researchers for producing relevant/useful knowledge. The institution can enlist the aid of alternate feedback sources in so doing, and thereby actively encourage user-researcher involvement.

CONCLUSIONS

In the context of the growing concern about practical usefulness of academic research, there is an urgent need for researchers to make their work more relevant to practitioners. We have suggested feedback as an important means for this purpose. A distinct advantage of feedback is that by bringing the knowledge creator (researchers) and users (practitioners) into close contact, and doing so at the very first step in the knowledge creation-diffusion-utilization chain, it greatly increases the likelihood as well as efficiency of practical utilization of research. Feedback also appears to have strategic value with reference to the criteria of "usefulness" offered by Thomas and Tymon (1982).

After establishing the importance of feedback in the creation of useful knowledge, we proposed a three-phase process model of effective feedback. We then demonstrated the application of this model in an academic research setting. This application, however, is merely illustrative; since empirical studies on the determinants of feedback effectiveness in academic settings are virtually non-existent at the present time, no definitive generalizations on the subject can be made. To us this appears a highly promising area for future research.

It should also be noted that feedback cannot influence the character of academic research independent of its institutional context,

which can either reinforce or nullify the impact of feedback. Therefore, we have drawn attention to a few key institutional factors and their impact. More research is needed to understand fully the interactive effect of feedback and institutional forces in steering academic research toward greater relevance.

APPENDIX

For the purpose of gaining a better understanding of the factors that govern the effectiveness of feedback to professional employees, an exploratory survey was conducted as part of a larger three-year study on performance appraisal and performance feedback (funded by the Office of Naval Research under Contract No. N00014-18-K0048).

The sample consisted of 136 high technology and/or professional employees from several departments of a large oil company headquartered in the East. The respondents were asked to think of one instance of critical but useful/effective feedback, and one instance of critical and useless/ineffective feedback, and with respect to each instance describe: (1) the setting in which feedback was given, (2) the feedback giver's behavior and actions that made the critical feedback useful (or useless), and (3) the outcomes or results of the feedback. In addition, they were asked to state the single most important reason that the critical feedback was useful in the first case, and useless in the second. Content-analysis of the lengthy replies surfaced several key issues in the feedback process which have guided the development of the feedback process model presented in this paper.

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Figure 2: The Feedback Process: A Three-Phase Model

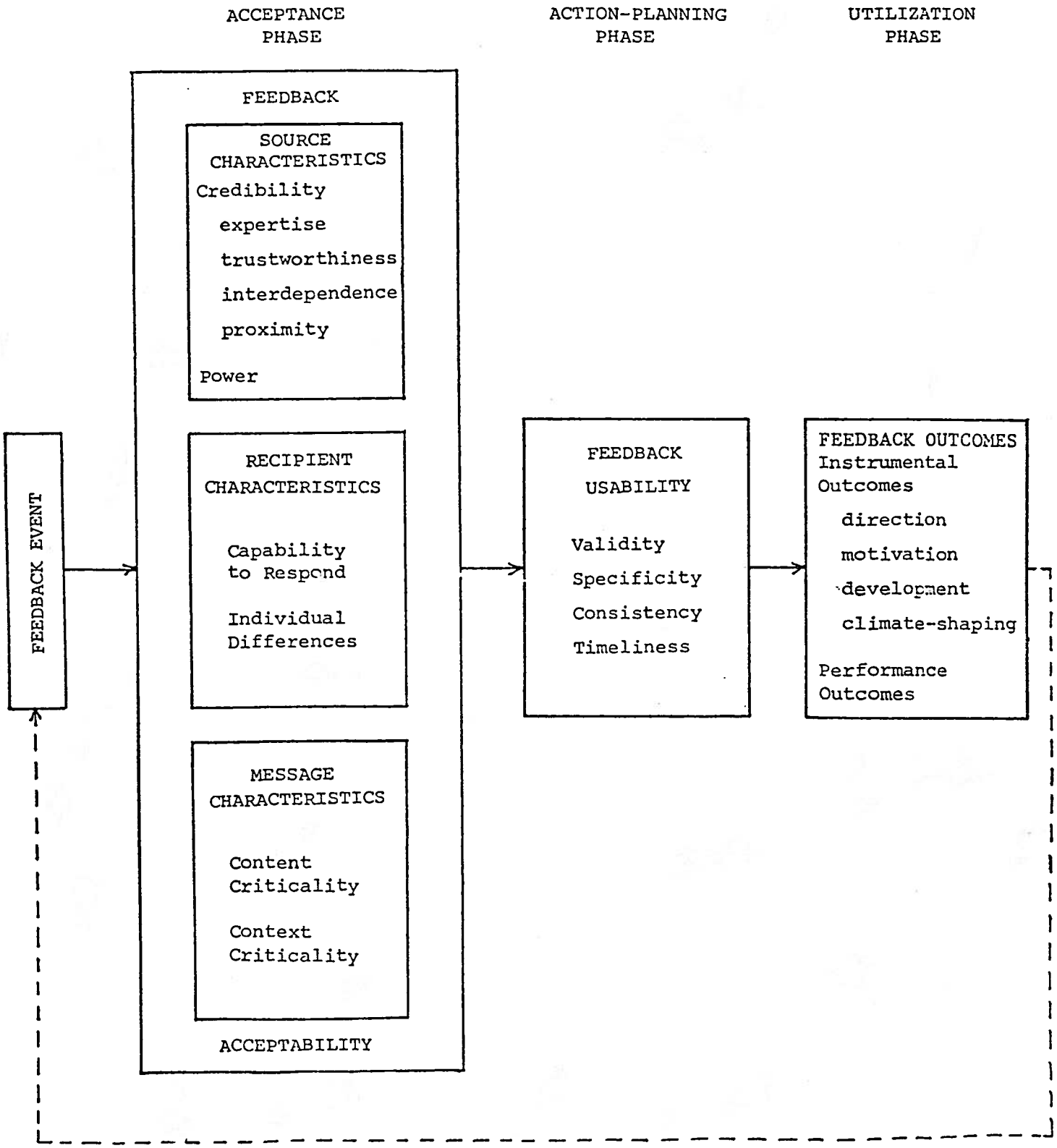

Figure 1: The Feedback Process: Outline of a Three-Phase Model