Universiteit Twente

Curriculum Program Panels:

Enhancing Instructional Program Validity[1]

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1.   Introduction

Some years ago Mulder & Dijkman (1988) did a study on characteristics of 57 trainers in large organizations and training programs they provided. Of these trainers about 70 % was employed in the training and development department and about two third was employed as training professional. Nearly all of them were working full time and again about two third were exclusively performing training and development duties. This sample therefore existed of nearly only fulltime employed training professionals. These professionals on average have much experience in the training and development field: only 14 % of them had less than two years experience in this field.

The results of the study clearly illustrate the issue of this contribution. One third of the trainers develop the training program themselves. Every two out of five courses are developed by teams composed by professionals from within or from outside the organization. About 28 % of the courses were adaptations of existing external course. Most of these adaptations (75 %) were realized by the training professionals themselves. This implies that about half of the training programs in this sample were developed or adapted by individual training professionals, who also taught these courses. Validation of a large amount of the training programs therefore is probably limited in nature, which may cause severe problems with the effectivity of these programs.

The same problem was found in another study when 113 respondents from companies with 100 or more employees were asked whether they used instructional systems design models for course development, whether they performed needs assessment and evaluation, and what problems they faced employing strategies for these model components (Mulder, Akkerman & Bentvelsen, 1989; Mulder & Streumer, 1991). Approximately 75 % of the respondents never heard of the models that were distinguished at all. Only in the larger companies with 1000 employees or more, training professionals knew some models, and those who knew a model tended to use that particular model for their own training program design and development. Major components of all course design models, such as formulating general training aims, translating goals into content and formulating measurable training objectives appeared to be performed by only 53%, 61% and 23% of the respondents respectively. Furthermore many respondents reported that they faced problems with needs assessment and course development activities, mainly concerning the cost-benefit ratio of these activities, but also because they perceived that there were to few appropriate techniques, and the organization had lack of competence to perform these activities (Mulder & Luijendijk, 1990). Again we tend to assume that the instructional program validity is limited in many cases as a consequence of this praxis. In another study Goldstein (1987) reports a limited level of content validity of instructional programs too, and he stresses the importance of this issue. Many authors contend that

instructional systems design requires prudent decision making (Romiszowski, 1991). In most cases instructional design is conceived of as a team effort. During the first stages of the design process, decisions are made about the content of the program. Curriculum program panels may be employed to validate the content of instructional programs. Curriculum program panels are nominal groups that are composed specifically for decision making on the content of instructional programs. We explicitly use the concept curriculum to emphasize the importance of the proactive nature of training and development, and to underline the necessity of the integration of instructional programs within the organizational and personnel policy and strategy.

In this contribution we shall explain the curriculum program panel methodology for training environments. Consequently we shall present the results of an evaluation of input, process and product characteristics of curriculum program panels. And finally we shall discuss some issues for further research and development.

2.   Curriculum program panels methodology

Curriculum program panels were originated as curriculum conferences by Karl Frey (1981; 1982), based on the theory of practical curriculum inquiry by the late Joseph Schwab (1969; 1971; 1973; 1983) and studies on curriculum deliberation of Walker (1975; 1990). These theories as well as the methodology gained wide interest in curriculum theory and curriculum research.

A curriculum program panel is a strategy for validating the content of an instructional program. It is an alternative of the curriculum conference approach developed by Frey (1981) for vocational and professional education. The term curriculum conference may be confusing however in corporate settings, therefore we prefer to define the approach as a curriculum program panel.

The panel as such is as well prepared nominal group (Delbecq, Van de Ven & Gustafson, 1975; Moore, 1987) or focus group (Krueger, 1988) in which about 12 training professionals and subject matter experts meet once during one or more days, to determine and validate the content of an instructional program. The panel meeting is concluded by a codification stage in which the final course content is edited (see figure 1).

----------Figure 1 about here ----------

The curriculum program panel approach consists of three components: the panel preparation, the panel itself, and the panel codification.

The panel preparation stage is aimed at composing the input for the curriculum program panel. The activities during this stage are mainly analytical in nature. The objective is to analyze the performance problems in the organization and to present this analyses and an alternative solution to the participants in the curriculum program panel.

The curriculum program panel itself is aimed at decision making and therefore we characterized this process as a synthesis process. During the panel sessions the information that is provided is discussed, and the content of the instructional program is determined and approved.

The last stage of the curriculum program panel approach is the codification of the panel results. This is the editorial work that arises from the panel discussions and conclusions. The contributions of participants during the panel are evaluated and compiled in the output of the panel's decision making process: the content of the instructional program.

We shall elaborate the three stages of the approach somewhat further.

2.1   Preparation stage

The preparation stage is aimed at composing an information document which provides a common information basis for the participants of the panel. The preparation stage may consist of several of the following components:
-    an analysis of the organizational strategy;
-    an analysis of the human resource development policy;
-    an analysis of the characteristics of the target group;
-    an analysis of the work environment;
-    a task analysis;
-    a trend analysis;
-    a curriculum analysis;
-    an instructional program evaluation;
-    a post-trainee program appraisal
-    etc.

The selection of the components of the preparation stage is contingent upon the goals of the instructional design project and the objectives of the curriculum program panel.

Once the components of the preparation stage are selected strategies for data collection have to be determined. Steadham (1980) has given a number of criteria for needs assessment as well as a review of nine basic data collection methods that may be employed here. The analysts who are doing the inquiries during the preparation stage may employ one or more methods for different components.

Besides the data collection methods the researchers have to determine the relevant data sources. Relevant data sources are of course contingent upon the components of the preparation stage, but there are many options:

- subject matter experts;
- job profile holders - master performers;
- supervisors or general management;
- personnel department;
- prior and post trainers;
- research and development professionals;
- existing training materials;
- policy plans;
- etc.

During this preparation stage analysts have to be sensitive for possible discrepancies in the information they collect. This attention may even lead to the decision as to whether the curriculum program panel will be held or not, for it is needless to organize such a panel when there is hardly any or even none prior disagreement about the intended course content. In many instances this will not be the case though, as there is often very limited pre consensus about candidate course content.

Let us assume that we have six components in a preparation stage: expert interviews, ex trainees interviews, supervisors interviews, content analysis of business plans, curriculum analysis of prior and consequent courses, and trainers interviews. In that case we have six sources of intracomponent and 15 sources of intercomponent discrepancies (see figure 2).

---------- Figure 2 about here ----------

If we imagine that each component can be further operationalized into at least four objects we see that there are many sources and objects that may cause disagreement on certain issues. The results of the preparation stage are compiled in an information document that is provided for the participants of the curriculum program panel.

Inviting of candidate participants for the curriculum program panel is a crucial element of the whole approach. When the wrong participants are invited, the results of the curriculum program panel have no solid basis. The question however is how organizers of curriculum program panels might further inviting appropriate persons as participants. Appropriateness with respect to the candidate participants of curriculum program panels can be defined as the amount to which the individual fits into a participants group profile that reflects the variation in the respective curriculum domain in the organization.

Variation sources for instance are:

- department size; the larger the department, the more specialized the candidate participant in most cases are;
- organizational branch; in what way is the branch confronted with suboptimal performance of the target group?
- professional category; are the candidate participants expected from management, the training or personnel branch or the intended trainees themselves?
- subject matter expertise;
- knowledge of the job practice;
- knowledge of the curriculum domain;
- communication skills;
- attitude towards training and development.

Depending on the curriculum domain and the importance of the instructional program, organizers of the panel sessions may attach different weighting factors to the criteria, which may result in a balanced desired group profile.

Defining the ideal group profile leads to the necessary data collection with respect to the variables just mentioned, but this may cause practical problems. Some variables are easy to operationalize, but other variables may appear to be difficult to measure. If organizers are in the position to collect data on candidate participants, they might consider to create a list with matched candidates, and to randomly invite one person of each pair. If this person is unable to attend, his or her matched person may be invited afterwards. This approach is aimed at composing a group without undesired disproportional representation of certain subpopulations that are distinguished, and may be employed when a high standard of reliability of the procedures is required.

2.2 Curriculum program panel

If the participants of the curriculum program panel do not know each other, the panel begins with an informal personal introduction. After this acquaintance the panel facilitator gives a description of the program of the panel sessions. A typical panel program may look as follows:

1. Completing content items lists, rating:
   - completeness of content items;
   - importance of content items;
   - difficulty of content items;
   - needed performance domain of content items;
   - needed performance level of content items;
   - needed instructional time for content items.

2. Analysis of the information document, which results in:
    -   informative questions and answers;
    -   sharing opinions on propositions;
    -   sharing arguments pro and contra opinions;
    -   decisions about the propositions;
    -   formulating conclusions for content of the instructional program.
3. Decision making on the content of the instructional program:
    -   analysis of the frequency distributions on the content item lists;
    -   studying the data of the group;
    -   informative questions and answers;
    -   drawing conclusions with respect to the content of the instructional program.

The tentative content items lists may be composed during the preparation stage and the completeness may be determined to ask the participants to add content items if necessary; importance, and difficulty may be rated with scales, the needed performance domain and level may be defined by using a taxonomy of training objectives (e.g. Romiszowski, 1981; Olbrich & Pfeiffer, 1980), and the needed instructional time may be estimated in hours or days. During the second stage of the curriculum program panel the data may be processed so that the results are available during the third stage of the panel. These results, as well as the conclusions that were drawn from the discussions on the information document, are the basis for the decision making stage. During this decision making stage it is important to emphasize argumentation. Quantitative differences in the data may reveal numerous interpretations of the proposed content for the instructional program on which consensus may be reached. This consensus is thought of as an important goal for the last stage of the curriculum program panel.

2.3   Panel codification

The discussions with reference to the information document, as well as the decision making on the content items of the instructional program, result in many conclusions that cannot be edited during the panel sessions. Furthermore, the conclusions with respect to the content items lists result in many additions that have to be amalgamated with the original items in a final document that comprises the content of the instructional program. This implies a final stage of editing this document, which may be send for final approval to the participants of the curriculum program panel.
This document serves as the main input for the subsequent activities in the instructional systems design project.

3.   Input-process-product evaluation of curriculum program panels.

The rationale behind the curriculum program panel approach is that involvement of heterogeneous groups of stakeholders is necessary to establish a broad platform for decision making on and approval of the content of an instructional program, assuming that this enhances the content validity of instructional systems design, especially when there are many differences of opinion regarding this content. Reaching consensus on the intended content of an instructional program in the main objective of the curriculum program panel sessions.

Therefore we carried out six projects from 1985 to 1990 in which input, process and product characteristics of curriculum program panels were investigated. The projects were aimed at:

I.   determining basic skills for secondary junior vocational education in two departments: mechanical engineering and business administration (Nijhof & Mulder, 1989);

II.   developing module descriptors for post-secondary senior business administration courses to be provided on the open training market;

III.   determining advanced skills for the upper level of secondary senior technical education in one department: production technology;

IV.   designing a two day client training program for service and maintenance personnel of large electrotechnical motors and generators in industry;

V.   determining the content of two employment training programs for adults on office and retail jobs;

VI.   validation of three job profiles for curriculum profiles of health care training programs.

In these projects 10 curriculum program panels (or curriculum conferences or working conferences as we called these sessions) were prepared and implemented.

During these projects we were able to collect several data on the input, process and product characteristics and other research questions (see table 1).

----------Table 1 about here ----------

We evaluated the curriculum program panels for the following questions:

a. What did the participants expect?

   What were their opinions on the information document?

   What were their prior opinions on the content of the instructional program?

b. What were the prior opinions on the content items?

c. What were the group decisions on the content items?

d. What were the post opinions on the content items?

e. What were the preferred communication rules?

f. What was the quality of the argumentation?

g. What were the opinions on the information document?

   What were the opinions on the participants?

   What were the opinions on participation?

   What were the opinions on the results of the panel?

Not all research instruments were employed in all projects, partly because of the conditions under which the projects were implemented, and partly because of the development in the curriculum program panel methodology as we practised it, and the research findings on the curriculum program panels from the first projects.

In this study we report the findings on the evaluation of the input, process and output component of the curriculum program panel projects. We distinguished the following variables:

Input evaluation:
- opinion on information document: participants were asked to report the amount to which they were satisfied with the information document;
- information missed: participants were asked to report whether they missed information that they found to be important for the curriculum program panel;
- recundant information: participants were asked to report whether they thought certain information was redundant.

Process evaluation:
- chairperson: participants had to rate characteristics of the chairperson on a scale;
- contribution to results: participants had to rate the amount to which they thought they contributed to the final results of the curriculum program panel;
- contribution of opinions: participants had to rate the amount to which they thought they had brought forward their opinions;

- attention to opinions: participants were asked to rate the amount to which they thought other participants paid attention to their opinions;
- participation in decision making: participants had to rate the amount to which they thought they participated in the decision making process;
- discussing information document: particpants had to rate the amount to which they thought the discussion on the information document was satisfying;
- characteristics of deliberation: the participants had to rate the amount to which they thought characteristics of deliberation were present in the curriculum program panel sessions; the following characteristics were distinguished:
  * openess;
  * directness;
  * comprehensibility;
  * argumentation;
  * manipulation.

Product evaluation:
- relevance: the participant were asked to evaluate the amount to which they thought the final product was relevant;
- completeness: the same was asked for the completeness of the final product;
- unambiguousness: the same was asked for the unambiguousness of the final product;
- representativeness: finally the respondents were asked to evaluate the respresentativeness of the final product with respect to the contexts in which these may be used.

The data for this evaluation were collected with instruments a. and g. For project V on employment training we could not use these instruments for practical reasons, which implies that this project is excluded from this study. In some other projects we used alternative questionnaires with partly different questions, which caused limited data collection with respect to the variables we distinguished. In table 2 we indicated this as being not applicable (NA). Data collection for the product evaluation in project IV on the client training program, was not differentiated into the four parameters we distinguished. Therefore we had to confine to entering one mean score for product evaluation of project IV in table 2.

The data on the characteristics of deliberation in the curriculum program panels for project VI on job profiles for curriculum development were collected with instrument f., for which we rearranged the variables so that they were comparable with four parameters we distinguished (for directness no comparable data were available). Data on the question whether participants

thought information was missing or redundant are nominal: the participants could answer yes or no. Data on the rest of the study are ordinal. The range of the scales that were employed varied from 3 to 5. The data were transformed into a scale of 0 to 1, to create the opportunity of comparison.

The number of participants of the curriculum program panels varied. The response numbers are indicated behind the project numbers in table 2.

---------- Table 2 about here ----------

If we look at the results in table 2 we see that the overall satisfaction is .74 for the input component, .78 for the process component, and .73 for the product component, which is reasonably high. It means that the large majority of the participants appreciated the informational document, the curriculum program panel sessions and the final product.

If we look more closely to the input evaluation we see a variation of .60 (panel 8) to .83(panel 1). Whereas the opinions on the quality of the information documents in the earlier projects are relatively constant, the information documents of panel 8 and 10 in project VI are relatively less appreciated (.60 and .62 respectively). The majority of the participants thought that the information document was complete. Only 26% and 13% respectively thought there was information missing or redundant information.

The process evaluation results show a variation of .87 (attention to opinions) to .62 (contributions to results). The contribution to the results was evaluated lowest by the participants of panel 5 and 9; the average score is .50 for both panels, which is in the middle of the scale, and therefore may be interpreted as being neither positive or negative.

The deliberation parameters varied from .71 (openess) to .83 (argumentation). Openess was evaluated lowest in panel 10 (.57). The results on argumentation show that projects I to IV scored .73 or above, whereas panels 8 to 10 in project VI scored .50 or below.

The product evaluation results show a range of .71 (unambiguousness and represen-tativeness) to .79 (relevance), which is only a relatively small range. The variation between panels with respect to the product parameters is relatively high: relevance varies from .62 (panel 5) to .95 (panel 3), completeness varies from .60 (panel 10) to .90 (panel 3), unambiguousness varies from .55 (panel 10) to .82 (panel 9), and representativeness varies from .60 (panel 10) to .85 (panel 9).

Because the overall means on the evaluation components are relatively high, and only one parameter (argumentation) scored below .50 (which is the middle of the scale indicating neither explicitly satisfaction or dissatisfaction) in one panel only (panel 8, score .45), we conclude that the curriculum program panel approach is a promising approach for enhancing instructional validity.

4.   Issues for further inquiry

Much is known already about decision making processes in groups (Hirokawa & Poole, 1986; Hendrick, 1987; Mink, Mink & Owen, 1987; Oskamp & Spacapan, 1987). Gouran & Guadagnino (1988) published an annotated bibliography on small group communication. Poole & Roth (1989) published a typology of group decision paths. Latham (1987) studied task type and group motivation and found some implications for a behavioral approach to leadership in small groups. Finally, Wall, Galanes & Love (1987) studied small, task-oriented groups and went into issues as conflict, conflict management, satisfaction, and decision quality. Mulder & Thijsen (1990) reported that agreement in curriculum program panels can be reached under the condition that little preconsensus exists, and that this consensus is relatively stable over time. Furthermore Mulder (1991) showed that the amount of experience of a chairperson of a panel session covaries with the perceived quality of the decision making process during the session.
We, however, know less of the effectiveness of the curriculum program panel approach with regard to the curriculum materials that are produced.

Although our studies into curriculum program panels yielded promising results, many questions remain to be answered. On the whole we contend that the proposed approach for enhancing instructional program validity is far better than the average practice of course development practice in every day reality in business and industry.
To prove that this is indeed the case we suggest to organize comparable projects in business and industry in which the curriculum program panel approach is the experimental condition. Content validity differences between the experimental and control conditions can be determined following the design employed by Goldstein (1987).
Our current research is aimed at long term stability of agreement on the curriculum content items for basic skills in vocational education. Theoretically these have to have a longer life-cycle than curriculum content items for post-secondary vocational education and in-company training programs. But in the same vain we may expect that the content of instructional programs that are appropriately validated has a longer life-cycle than poorly validated content, which may establish long term cost reduction, as less content revisions may appear to be

necessary, although the employment of the curriculum program panel approach may be an additional short term investment.

Furthermore we are trying to have the products of curriculum program panels evaluated by comparable groups of persons who did not participate in the panel sessions, to correct the evaluation results regarding the product opnions and the stability of agreement for a possible participation effect. This strategy gives at the same time the opportunity to have the acceptation of the products assessed by larger audiences than those who were present at the panel session.

Consequently we are trying to study the usefulness and use of the product perceived by the target groups.

As far as the process of the curriculum program panel approach is concerned, we are going to look at the consequences of the interventions of the chairpersons. This chairperson has a very complex role in the deliberations during the panel sessions, and we expect that he or she has a significant impact on the process and perhaps on the product of the session. If this indeed is the case, we would suggest to design and implement a training program for the panel chairperson.

Finally we are interested in the impact of the information document. Because composing this document during the preparation stage consumes relatively much time, it has to have impact on the decision making process. If this appears not to be the case curriculum program panel organizers may find an opportunity here to condensate the whole approach.

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Enclosure 2

Instructional Design Project

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+--------------------------------------------------------------------+
|                                                                    |
|    input               process               output               |
|    +-------------+      +-------------+       +-------------+       |
|    |Panel        |      |Curriculum   |       |Panel        |       |
|    |Preparation  |---> >|Program      |---> > |Codification |       |
|    |             |      |Panel        |       |             |       |
|    +-------------+      +-------------+       +-------------+       |
|                                                                    |
|    analysis            synthesis             evaluation            |
|                                                                    |
+--------------------------------------------------------------------+
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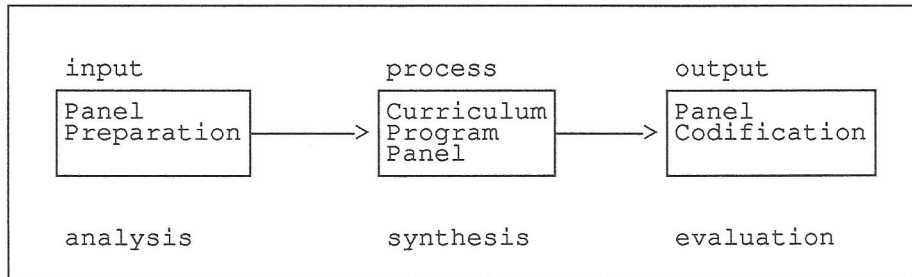
Figure 1. The components of the curriculum program panel approach for
          enhancing instructional program validity.
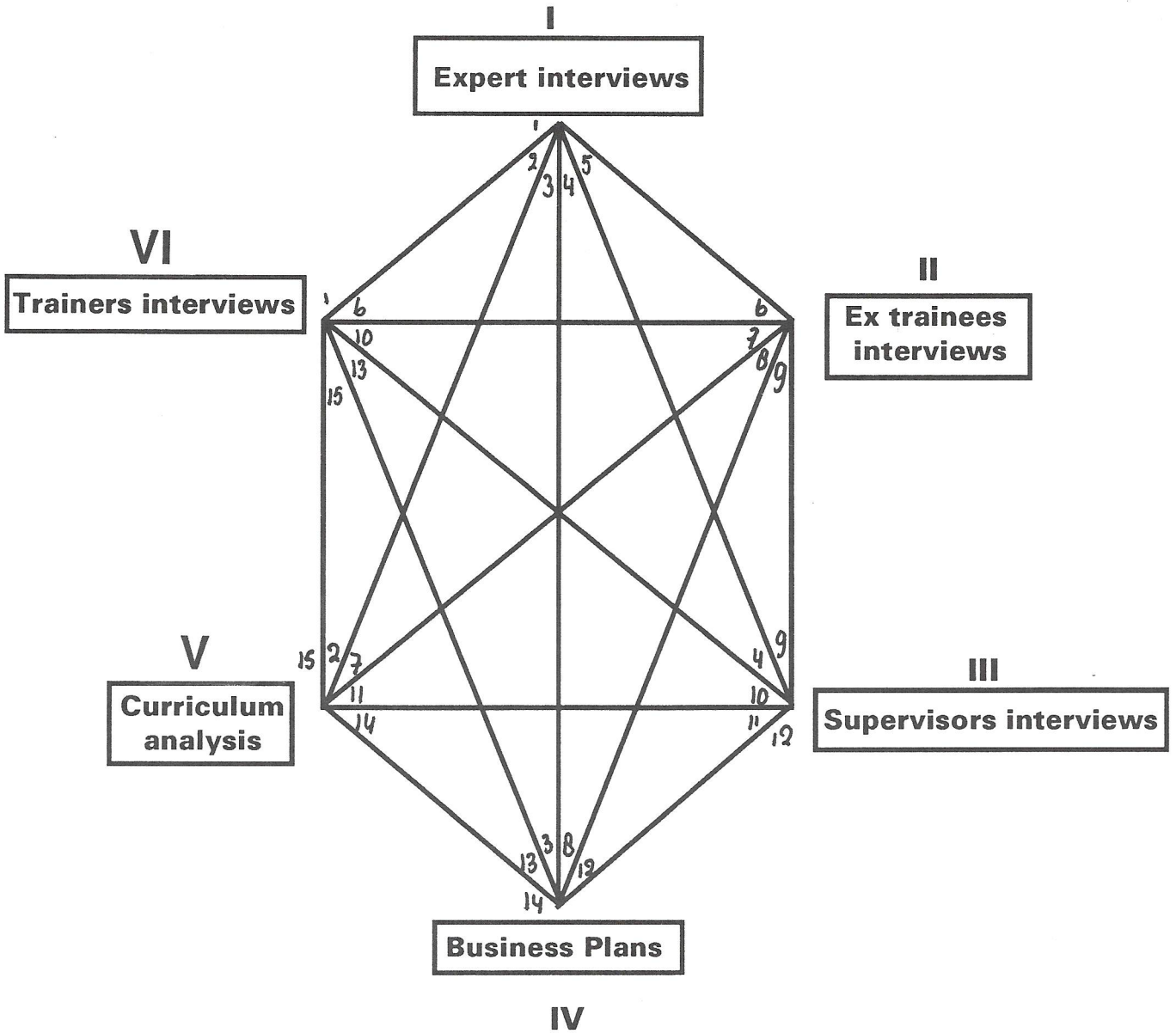
Enclosure 2

Figure 2: Intracomponent (I-VI) and intercomponent
(1-15) discrepancy sources in the curriculum
program panel preparation stage.

Enclosure 3

Research instruments	Projects									
	I		II	III	IV	V		VI		
	Basic skills		module descriptors	advanced skills	client training	employment training		job profiles		
	1	2	3	4	5	6	7	8	9	10
a. Questionnaire 1	X	X	X	X	-	-	-	X	X	X
b. Prior rating of content	-	-	X	X	X	-	-	X	X	X
c. Group rating of content	X	X	X	X	X	-	-	-	-	-
d. Post rating of content	-	-	X	X	-	-	-	X	X	X
e. Communication rules	-	-	-	-	-	X	X	X	X	X
f. Argumentation	-	-	-	-	-	X	X	X	X	X
g. Questionnaire 2	X	X	X	X	X	-	-	X	X	X

Table 1. Data collection for evaluation of curriculum content panels.

Variables	Projects								Total	Mean	Mean of means
	I	II	III	IV		VI					
	1 (8-13)	2 (7-12)	3 (8-10)	4 (12-13)	5 (5-6)	8 (12)	9 (10)	10 (10-11)			
Input evaluation											
– opinion on information document	.83	.77	.77	.77	.77	.60	.75	.62		.74	
– information missed yes	7	7	1	1	3	–	–	1	22	26 %	
– information missed no	5	5	11	11	3	12	10	10	62	74	
– redundant information yes	NA	NA	2	2	NA	3	–	2	7	13	
– redundant information no	NA	NA	9	10	NA	9	10	8	46	87	
Process evaluation											
– chairperson	.77	.77	.70	.77	.64	.64	.87	.60		.72	
– contributions to result	.77	.70	.64	.66	.50	.60	.50	.60		.62	
– contribution of opinions	.97	.97	.93	.90	.93	.55	.57	.55		.80	
– attention to opinions	.87	.87	.97	.90	.90	.82	.82	.77		.87	
– participation in decision making	.73	.73	.90	.93	.50	.77	.85	.75		.77	
– discussing information document	.80	.77	.80	.87	.87	.77	.85	.75		.81	
– characteristics of deliberation											.77
– openess	.83	NA	.73	.77	NA	.62	.72	.57 **		.71	
– directness	.83	NA	.73	.87	.93	NA	NA	NA		.84	
– comprehensibility	.77	NA	.70	.87	1.00	.72	.80	.67		.79	
– argumentation	.77	NA	.73	.73	.90	.45	.50	.47		.83	
– manipulation (1.0 is no man.)	.67	NA	.70	.77	.73	.75	.90	.67		.74	.78
Product evaluation											
– relevance	NA	NA	.95	.75	.62*	.82	.90	.72		.79	
– completeness	NA	NA	.90	.65		.77	.80	.60		.72	
– unambiguousness	NA	NA	.80	.75		.72	.82	.55		.71	
– representativeness	NA	NA	.70	.70		.80	.85	.60		.71	.73

Table 2 Curriculum program panel participants' evaluations of input, process and product. Project V had only a limited data collection that was related to this study and therefore was excluded. The response numbers are indicated behind the project number. The ordinal data were transformed into a scale of 0–1 for comparability(0 = minimum; 1 = maximum) NA = Not Applicable; * = not differentiated; one score was collected for the quality of the product; ** collected with instrument f, variables rearranged.