Re-thinking training needs analysis

A proposed framework for literature review

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Abstract: This paper reviews the literature on training needs analysis with the intention of organizing conceptually the various approaches. It offers a way of going beyond simple descriptions to a quantitative approach. A simple yet comprehensive model is proposed which consists of four aspects focusing on four related questions: Who are the key initiators of the TNA studies? What are the levels of interest in the studies (i.e. organization, process, group and individual)? What methods of analysis are used? What is the intended outcome of the analysis? Based on these, four hypotheses are proposed. A literature search produced a total of 118 articles, of which 44 were randomly picked for detailed review. As expected, the literature was dominated by “supply-led” players, i.e. trainers and academics, but with an unexpectedly strong emphasis on the “demand-led” aspects of the organisation, especially its business results and growth.

Introduction

Survey evidence from the UK and the USA suggests that over 90 per cent of firms engage in some forms of development activities for managers (Constable, 1988; Loo, 1991; Saari et al., 1988). To design such development activities, it has become of prime importance to conduct a “training needs analysis” (TNA) prior to embarking on management development (Berger, 1993). Although there is a difference in the label, both of them represent a systematic effort to gather information on performance problems within the organization which might be remedied by training and development (Anderson, 1993; Bennett, 1992; Ferdinand, 1988).

The purpose of this paper is to review the literature on TNA, with the intention of organizing conceptually the various approaches, based on four related questions: who are the key initiators of TNA studies? What are the levels of interest in the studies? What methods of analysis are used? What is the intended outcome of the analysis? Based on these, four hypotheses are tested and discussed.

Supply-led approach to TNA

The information can be obtained from a variety of sources (e.g. McGehee and Tayer, 1961; Rossett, 1987). One major source of information about training needs is what scholars describe as the “pedagogical” approach (Delahaye, 1992).
or “supply-led” approach. This approach is largely trainer-driven and authority oriented coming from the vested interests of trainers (Thompson, 1994). Traditionally, trainers are responsible for identifying training needs and the scope of the assessment can cover any level of the organization. To assess training needs, it is not an uncommon practice for trainers to adopt a skill model or taxonomy as a framework to help compile a list of tasks, and ask job incumbents to indicate their training needs for every item on the list. However, this approach may unwittingly introduce problems to needs assessment. Trainers often lack line management experience and do not understand the real operational issues (Bucalo, 1984). The skill model often captures imprecise trait labels and global behavioral descriptions (Campbell et al., 1970; Powers, 1987; Whetten and Cameron, 1991). These trait labels and behavioral descriptions may simply reflect the trainers’ preconceptions of the job which may or may not match with that of the potential trainees.

Demand-led approach to TNA
Business-oriented. The supply-led approach of TNA has been increasingly challenged by changes in the business world which emphasize the “bottom-line”, profitability, growth, etc. This leads to such sources of information about training needs as the organization’s business plan. Ferdinard (1988) described TNA as a “rational process by which an organization determines how to develop or acquire the human skills it needs in order to achieve its business objectives”; hence, it is anticipatory in nature intending to meet long-term organizational objectives (Snape et al., 1994). Thompson (1994) has identified this with a “demand-led” approach. Top managers – chief executives and directors – are conceived to be committed to investment in training because they see its importance to the success of the business. The key to the approach is seen to be the business planning process, which establishes the context and mission of the organisation. This therefore identifies the context for training and demonstrates how the training effort is integrated with the wider business purpose. Demand-led training suggests needs analysis techniques such as management by objectives (MBO) as a means of linking individual objectives with business purpose and of identifying the areas where the individual may need training in order to achieve his or her objectives. To summarize, this business-oriented approach is characterized by a top-down, finance-driven process (e.g. profit, growth) emphasizing more on the business outcome and less on employees’ needs.

Process-oriented. Besides the business-oriented approach, we propose that the “demand-led” aspect of TNA has another counterpart – the process-oriented approach. The process-oriented approach is different from the business-oriented approach in terms of its scope and emphasis. While the business-oriented approach focuses on the whole organization, the scope of the process-oriented approach is mainly on a localized division or a department. Very often, training needs arise because of the introduction of new processes such as business process reengineering, total quality management (TQM), ISO 9000 in
Training needs analysis

Re-thinking training needs analysis

A subdivision of an organization. The purpose of identifying training needs at this level is to ensure the new work processes can be introduced in an effective and efficient manner.

Trainee-centred. The “demand-led” approach (i.e. business and process oriented) may be contrasted with a more trainee-centred approach or what Delahaye (1992) described as the “andragogical” approach. Unlike the “demand-led” approach, the trainee-centred approach is characterized by a bottom-up, self-development driven (e.g. performance, promotion) emphasizing more on employees’ needs and less on the business outcome or work efficiency. The trainee-centred approach often relies on self-assessment as the source of information. Research findings suggest that self-assessment may be a true reflection of trainees’ development needs and should be considered as an important component of a valid needs assessment process (McEwen and McEwen, 1987). However, self-assessment of training needs is also under strong criticism because it may sometimes reflect trainees’ training wants but not the actual training needs (Nowack, 1991). Trainees tend to be more lenient on their ratings and make relatively more attributions (i.e. excuses) to external environment. All these tendencies would inevitably undermine the accuracy of the TNA data.

Using this framework of TNA approaches, it is interesting to know whether a particular approach is more prevalent than the others in the TNA literature. However, the majority of the studies in the TNA literature has been descriptive and anecdotal in nature, making the detection of these differences in TNA approaches difficult. One major purpose of the present research study is to review the literature on training needs analysis with a view to organizing conceptually the various TNA approaches. A simple and yet comprehensive framework is proposed here which attempts to identify the prevalent TNA practice as reported in the literature (see Figure 1).

The model consists of four aspects aiming at answering four related questions. The four questions being:

Figure 1. The proposed TNA model
Who are the key initiators of the TNA studies?

What are the levels of interest the TNA studies seek?

What methods are used?

What is the intended purpose of the analysis?

We believe that the background of an initiator would, to a great extent, affect the approach used in TNA. For example, organizational representatives tend to use a “demand-led” approach, whereas, the trainers and trainees would adopt the “supply-led” and the “trainee-centred” approach respectively. Although the “supply-led” and the “trainee-centred” approach are equally important compared to the “demand-led” approach, we believe that the trainers are still the dominant key initiators. The dominance of trainers in this field would logically imply that the level of interest is mainly “supply-led”. That is, trainers are concerned more with the group level – groups of trainees – for their competency-based analysis and less with other levels of interest, especially the individual and the organisational levels. The “supply-led” approach would further imply that trainers would take an active role in assessing training needs. Examples of these methods include interviews or observations (e.g. assessment centres) in which trainers play a major role in needs assessment as well as questionnaires designed by trainers (e.g. job analysis questionnaires) to collect inputs from job incumbents on a specific job position. Finally, the “supply-led” approach will further imply that most TNA studies were conducted with an aim of enhancing managerial and professional effectiveness. Based on the above arguments, the following hypotheses are proposed:

H1: Trainers as a group constitute the largest proportion of initiators of TNA among all other groups of initiators.

H2: The proportion of TNA studies targeted at the group level is larger than at other levels.

H3: The largest proportion of assessment methods used in assessing training needs are done either by trainers themselves or through some form of structured questionnaires designed by trainers.

H4: The largest proportion of the intended purpose of the TNA activities aims at enhancing managerial/professional effectiveness.

Method
Sampling strategy
A literature search was undertaken through the CD-ROM of the University Libraries system for the past 25 years. Initially, four databases were inspected. They are ANBAR, Psylit, ABI/Inform and ERIC. Subsequently, ERIC was dropped because the studies are mainly for education rather than for business. In searching for relevant articles, many key phrases have been used (e.g. managerial training, training needs, self-development). However, many articles identified using these phrases were not directly relevant to TNA. We decided to
restrict the search to two key phrases that are directly related to TNA. These two phrases are training needs analysis and training needs assessment. As a result, 130 articles were identified, of which two were from ANBAR, 29 from Psylit, 99 from ABI/Inform. Among the 130 articles, 12 were cross-referenced by more than one database and that reduced the total number of articles to 118. Next we randomly picked half of the articles, that is 58, for the review. Of these 58 articles, 14 were dropped during the review process because the content was not relevant to TNA even though they carried the key phrases of TNA in the text. A complete list of the 44 studies is included in the Appendix.

Classification scheme of the proposed framework
The TNA model covered four aspects. The first aspect was the key initiators. A key initiator was defined here as the one who initiated the study. In most cases, the key initiators might well be the author of the study but, occasionally, the author simply reported on a TNA study conducted by someone else. In this case, the originator(s) of the study should be considered as the key initiator(s). A TNA study could be initiated by organizational representatives (e.g. CEO, the director, or the manager), trainers (e.g. training consultants or academics), or from the trainees themselves.

Also, the model tries to distinguish various levels of interests in the TNA studies. These levels can be macro (i.e. the business performance), micro (i.e. individual performance) or at a level somewhere in between (i.e. the performance of a localized system or a specific incumbent group). There are seen to be four possible levels. If the aims of the study targeted at the macro level involving analyses of organizational goal or companywide changes like cultural change, market change, we would consider it as the organizational level. A study is classified as the process level if the training need arises because of the introduction of new processes such as TQM or ISO 9000 in a localized division or a department. The third level is at the task level. At this level, training is catered to the needs of a group of job incumbents on some specific job related skills. Finally, training programmes may focus on the needs of a person. The skills being taught in these training programmes are generic in nature (e.g. stress management, problem-solving skills, presentation skills) with no direct job relevancy and are highly transferable from job to job.

The third aspects of the model is about the different assessment methods used for the need assessment. If the TNA is “demand-led” in nature, the techniques should be different from those in the other three categories. A demand-led approach to TNA would employ methods such as organizational scanning and SWOT. The former example is a useful method for identifying internal needs of the organization whereas the latter put the organization in an environment context when assessing needs for development. To analyse processes or systems, methods like process analysis or taskflow analysis are good examples of this category. The third category of methods includes various types of interviews or observations (e.g. assessment centre, peer evaluation). Very often, the assessment involves an interviewer or observer to solicit
comments from respondents. Compared to the last two kinds of methods, this assessment approach may require more subjective interpretation on the part of the assessors. Finally, there are methods used to assess the development needs of an individual. A good example of such a self-assessment method is think aloud protocol.

Finally, it covers the kinds of intended purpose of the analysis. These levels differ in whether the study mainly aims at the organizational effectiveness (e.g. profit, growth, etc.), the system/process effectiveness (e.g. effectiveness, efficiency), managerial effectiveness, or personal effectiveness.

Interjudge reliability
Before coding the contents of the sampled studies, a training session was held having team members reviewing five articles together using the classification scheme. The purpose of the training session was to ensure a uniform interpretation of the coding scheme. Next, the team members were divided up into two pairs. Each pair was responsible for reviewing half of the sampled articles. Team members of each pair coded the articles independently according to the classification scheme and the coding results were then compared with those of the other team member. The Kappa statistics (Cohen, 1960) were used as a measure of agreement between the two pairs of judges on the sampled articles using nominal scales.

Results
The following section first reports the Kappa statistics on interjudge agreement on the four aspects of our proposed model. It is followed by reporting the observed proportions of various categories in the model. Finally, hypothesis testings will be conducted using a series of Huberty one-tailed t-tests to examine whether the observed proportions are significantly greater than chance.

Interjudge reliability
Table I gives summary statistics for each of the dimensions proposed in the present model. The results show that interjudge reliabilities of the four dimensions are extremely high. The values of Kappa are between 0.75 to 0.94.

<table>
<thead>
<tr>
<th>Category</th>
<th>( \hat{A} n_{ij}^2 )</th>
<th>( P_i )</th>
<th>( k_j )</th>
<th>Var (k_j)</th>
<th>SE (k_j)</th>
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<tr>
<td>Actors</td>
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<td>0.91</td>
<td>0.07</td>
<td>3.5**</td>
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<tr>
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<td>0.94</td>
<td>0.01</td>
<td>9.4***</td>
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<tr>
<td>Purpose</td>
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<td>0.85</td>
<td>0.79</td>
<td>0.003</td>
<td>15.8****</td>
</tr>
</tbody>
</table>

Notes: * = \( p < 0.05 \); ** = \( p < 0.01 \); *** = \( p < 0.001 \); **** = \( p < 0.0001 \)
The degree of agreement (corrected for the amount expected by chance) is at least 75 per cent between any randomly selected reviewer. In fact, interjudge reliabilities in two cases are up to 91 per cent and 94 per cent. All the values of $k_j$ are significantly greater than chance.

**The key initiators**

The overall proportions of the three proposed initiating sources of TNA, the demand-led, the supply-led, and the trainee-centred, are 13, 87, and 0 per cent, respectively. Of the 87 per cent of the supply-led contributors, two-thirds are affiliated with universities and the other one-third are training consultants. To find out whether the observed proportion of trainers/academics is actually better than chance (i.e. 33 per cent in a three category case), the Huberty one-tailed $z$ test was used (Stevens, 1986, p. 257). The result of the test indicated that the observed proportion was highly significant, $z = 11, p < 0.0001$. The findings confirmed $H_1$ and hence supported the idea that the key initiators of TNA in the literature are predominantly trainers and academics. Contributions solely made from top or line managers (i.e. demand-led approach) are rare and none so far was found from trainees (i.e. trainee-centred approach).

Another interesting observation is that, despite the fact that joint efforts among players of different professional backgrounds are encouraged, there was little evidence that academics, consultants and managers would work together in TNA research. Of all the papers reviewed, there were only three mixed cases with an academic and a manager co-authoring a paper.

**Levels of analysis**

Results showing that the proportion of studies done on analysing organizational needs is the highest (36 per cent) and this is followed by the group level (26 per cent) and the process level (24 per cent). Investigations at the individual levels are relatively few (14 per cent). The Huberty one-tailed $z$ test indicated that the observed proportion found in the group level was not significant, $z = 0.5, p = ns$. Although we cannot find support for $H_2$, the findings are not entirely unexpected. The findings suggest that organizational needs often take precedence over those of the groups or individuals. It is the organization which determines what the training needs are in order to meet with its business objectives. The Huberty one-tailed $z$-statistic test indicated that the observed proportion found in the organizational level was significant, $z = 2.2, p < 0.05$. Again, the findings confirmed, to a certain extent, a frequent use of demand-led approach in the TNA literature at the level of analysis regardless of who are the initiators.

Such a demand-led approach is even more obvious when the data are plotted against time intervals. Figure 2 shows that while number of TNA studies are steadily increasing, the rate of increase in demand-led approach is the fastest. According to the present findings, the approach first surfaced in the early 1980s and then increased drastically from late 1980s onward. A similar pattern can be found for the process level though the trend of increase is less extreme. One of
the possible reasons for an exponential growth in the demand-led approach may be due to the rapid changes in business environment during the past two decades making the demand-led approach a priority in TNA.

A significant portion of the demand-led studies aims at improving the linkages between organizational strategies and TNA. These studies criticize, one way or the other, the limitations of some existing models. The existing models are called by different names. They are coined as the traditional model (Bucalo, 1984), the objective model (Hiebert and Smallwood, 1987), products-oriented model (Macleod, 1987), closed system model (McClelland, 1993), and deficit model (Anderson, 1994). There are several themes of criticism with regard to these existing models. Many of the existing models were accused of being too simplistic (McClelland, 1993), wrongly assumed that jobs are invariably embedded in a relatively static business environment (Hiebert and Smallwood, 1987), measured merely past deficiencies (Anderson, 1994), failed to link with the organizational operations (Bucalo, 1984) and corporate strategies (Macleod, 1987). The contributors recommended that TNA models should be more comprehensive, adopt an open system approach, anticipate future efficiencies and align closely with organizational operations and strategies.

**Assessment methods**

The overall proportions of the four kinds of assessment methods, the organizational assessment, the process assessment, the assessment by trainers, and self-assessment, are 15, 9, 40, and 36 per cent respectively. The findings confirmed H3 that the methods used in many studies are mostly traditional means such as interviews, observations and questionnaires. A gain, the Huberty Figure 2. Distributions of TNA studies by year

![Figure 2](image-url)

Number of Studies

<table>
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<tr>
<th>Year</th>
<th>76-80</th>
<th>81-85</th>
<th>86-90</th>
<th>91-95</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Individual</td>
<td>Group</td>
<td>Process</td>
<td>Organization</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
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<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
one-tailed z-test indicated that the observed proportion of “supply-led” methods was significant, $z = 3.48, p < 0.05$ (assessed by trainers). However, it should be noted that most of the traditional assessment methods were not employed to assess group needs. Most of the studies using interviews and observations were focused on identifying training needs for other levels of interest.

Intended purpose of TNA

The overall proportions of the four possible beneficiaries are 39 per cent for the organization, 28 per cent for the effectiveness of the process, 22 per cent for specific incumbent groups, and 11 per cent for the personal effectiveness. The Huberty one-tailed z-test for testing $H_4$ was not significant. However, it is worthwhile to note that regardless of at what levels of analysis the TNA is conducted (whether it is at the level of the process, the group or the individuals), the manifest purpose is either obscure or often targeted to the effectiveness of the organization. A post hoc analysis reviewed that organizational outcome was the most cited objective for conducting TNA studies (the Huberty one-tailed z-statistic test was significant at $z = 3.0, p < 0.01$). One reason is that the trainers who provide service to the organization will tend to highlight the benefits to the organization so that their proposals would be accepted by the senior management. Yet, in essence, the purpose of conducting the TNA should be beneficial to the parties other than the organization. The stated purpose, thus, depends very much on who is the user of the service. Since individuals are rarely the buyers, few studies would mention that the benefits are targeted to individuals. Nevertheless, individuals are, in fact, benefited.

Discussion

The present paper contributes to the TNA in several ways. First, it is the only paper, as far as we know, that uses quantitative method to review the TNA literature. The great majority of articles reviewed were based, to a greater or lesser extent, on case study evidence. Some were carefully conducted studies. For example, Nelson et al.’s (1995) recent study of US Internal Revenue Service is an empirical test of the “content framework” derived from the literature of McGehee and Thayer (1961) and Ostroff and Ford (1989). But most of the articles did not derive data in such a systematic way. All too often, an interesting framework of new approach was supported by no more than the authors’ experience and anecdotal evidence. It is to be hoped that use of quantitative methods in the present paper will encourage more systematic collection and analysis of data in studies which go beyond single cases to embrace wider cross-sectional and longitudinal perspectives. In addition, there may be added value from greater collaboration between academic researchers, training and development practitioners as “suppliers” and business managers as “demand-led” users.

Second, we have successfully introduced a simple but reliable model centring on the concepts of different TNA approaches to capture various aspects of TNA. It builds on the pioneering work of McGehee and Thayer (1961) and
Ostroff and Ford (1989). These writers focused on level and content. To these important aspects, we have added methods of analysis and expected outcomes, as a means of enriching understanding of the analytical process. The model is therefore useful in guiding further research into TNA and in helping to classify future studies. It is clear that some cells in the matrix have received less attention than others.

Third, the findings of the present paper shed light on what range of work has been done and what may remain to be done. We confirmed as expected that the TNA literature was dominated by the supply-led initiators (i.e. trainers and academics). Nevertheless, the supply-led initiators did not focus on one particular level of analysis. They covered pretty evenly on three of the four levels (i.e. organizational, process and group) and less so on the individual level. In addition, the TNA literature was flooded with recommendations on what methods should be used; nonetheless, the development of methods is lagging behind in a number of ways. First, although the tools being recommended are useful to the training field, most of them are generic in nature and not developed originally for needs assessment purposes. For example, in a series of papers, McClelland (1994a, 1994b, 1994c, 1994d) introduced four data-collection tools, namely, surveys, individual interviews, focus groups and on-site observation, as four important TNA tools. Others (e.g. Schwarzkopf et al., 1980; Stein, 1981) modified some generic tools and found applications in the assessment of training needs. These generic tools may be appropriate under the existing TNA models; however, they are somewhat inadequate with the advancement of new assessment models (e.g. the emphasis on linking training with corporate strategies and anticipating future performance efficiencies on a changing business environment). A few studies have introduced new tools to fit in the new TNA models. For example, action research techniques such as front-line analysis capture the dynamic nature of training needs in the actual working environment (Anderson, 1994). Nevertheless, there are no empirical studies to validate these models. This is another limitation to TNA methods.

Organizations tend to neglect the developmental needs of individuals. As a result, there are not many self-assessment tools developed for self-development purposes. One of the major reasons is that the assessment of individual needs is very expensive and in the company’s perspective, the needs of an individual are not important to bottom-line issues. It is clear from our evidence that the trend is now concentrating on the business effectiveness rather than the personal effectiveness. The focus of the training debate should be on how to balance the needs of the individual and the organisations. There is a danger that if it moves too far away from the individual needs to the business bottom-line issues, in the long run, a demoralised workforce will hinder the growth of the organisation. This message has been picked up by a number of professional organisations who have launched programmes such as continuous professional development (CPD).

The strength of our approach is also a limitation. It focuses on and organises a particular “moment” in the training and development cycle. It helps to clarify
that moment but, in doing so, it is ignoring the total sequence of analysis, design, implementation, evaluation. This risks a fragmented look at what is in reality so often a more integrated process. It can also give an impression that TNA is done once at the beginning of training and development, whereas it is often part of an integrative process, revisited in the light of subsequent experience. Future research should examine the whole process of TNA rather than a cross-sectional analysis. A second limitation of the present study is that we have confined ourselves to published articles, both academic or practitioner, which are available to us from the three chosen databases. There may be a lot of TNA articles and activities not brought to our attention and, hence, the findings of this study may be somewhat limited. Interpretation of the findings should be done with this caution in mind.

References
Personnel Review 28,1/2


Appendix. Studies sample for the analysis


