An Exploratory Study On Knowledge Transfer At A University Conference

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ABSTRACT:

The main hypothesis behind this exploratory study was that lecture settings and formats may influence the efficiency of knowledge transfer in the context of conferences. To address this topic, questionnaires were sent to participants of a scientific conference before, a few days after, and again approximately 3 months after a conference. The results suggest that interactive formats may be more efficient than one-way communication. Further, this study indicates that the methodology of using pre-, post-, and follow-up questionnaires may be well suited for the evaluation of knowledge transfer in this context. Such information may also be valuable for conference organizers.

Keywords: *Knowledge transfer, Conferences, Lectures, Interactive formats, Questionnaires*

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1. Introduction

Knowledge transfer channels vary in measurability and accessibility. Channels that produce “tangible” data, such as patents, have been used extensively in studies of innovation. Other channels, such as conferences, lack quantifiable data making them to difficult to study and assess. Conferences, however, are a common component of many academic and professional environments. This study examines the effectiveness of a conference as a knowledge transfer channel.

The main hypothesis motivating this study was that lecture settings and formats may influence the efficiency of knowledge transfer. For example, formal lectures, interactive discussions, or workshop formats may not be equally effective formats for transferring knowledge to, or between participants. One assumption was that knowledge transfer is more effective with increasing levels of involvement, i.e. that active participation encourages greater knowledge transfer.

In considering a particular conference to evaluate, we opted for a conference that consisted of large lecture-style sessions, combined with smaller meeting-style sessions. Scientific conferences, for example, may be suitable for studies of knowledge transfer, since such conferences are typically comprised of many types of formats, such as

lectures, discussions, and workshops. Further, conferences often focus on particular areas of knowledge.

The main purpose of a conference is to transfer of new knowledge. Therefore it is of interest to study how efficient different format are. Other benefits with a conference, such as the social value, may also be important for knowledge transfer. For example, informal and personal conversations may give context to new information, strengthen existing ties and contacts, and build and further extend knowledge networks.

This study was planned and designed to investigate the relationship between formats. The authors developed questionnaires that were administered before the conference, directly after, and again 3 months after. The conference selected took place at a Swedish university in November-December 2007. A total of 156 participants from various countries participated in the two and a half-day conference.

2. Related Work

This section provides a brief background on knowledge, knowledge transfer, and conferences. The first section will briefly review a knowledge taxonomy created by Lam, and define knowledge as it is used in this study. The second section will review different knowledge transfer channels, specifically between university and industry, while the third section will review literature on conferences and meetings.

2.1. What Is Knowledge?

Given the amorphous nature of knowledge, a universally agreed upon definition has yet to be established. There is, however, consensus on certain characteristics of knowledge, such as the distinction between tacit and explicit. Lam (2000) provides a taxonomy of knowledge at the organizational and individual level as it relates to explicit and tacit knowledge. Lam (2000) argues that there are four kinds of knowledge: ‘embrained’, ‘embodied’, ‘encoded’, and ‘embedded.’ These four kinds of knowledge are specific to the collective and the individual (see Table 1).

		Ontological dimension	
		individual	collective
Epistemological dimension	explicit	Embrained knowledge	Encoded knowledge
	tacit	Embodied knowledge	Embedded knowledge

Table 1: Cognitive Level - Knowledge Types (Lam 2000)

According to Lam, embrained knowledge is "formal, abstract or theoretical knowledge," (2000) such as scientific knowledge. Embodied knowledge, is based on practical experience and is applicable only in certain situations. At the collective level, encoded knowledge is information that is "codified and stored in blueprints, recipes, written rules and procedures" (Lam 2000). Last, Lam describes embedded knowledge as the "collective form of tacit knowledge residing in organizational routines and shared norms" (2000).

In the context of this study we have used the following definition of knowledge: ideas and insights into theoretical and practical issues. For example:

- An understanding of an issue
- An organizational, public policy, or professional strategy
- A piece of useful information
- A professional network contact
- A technique, way of thinking or analytical tool

This definition is specific to the individual and best reflects the kind of knowledge that might be transferred at conferences/meetings.

2.2 Knowledge Transfer Channels

Knowledge transfer channels between university and industry include the following: publications, patents, consulting, informal meetings, recruiting, licensing, joint ventures, research contracts, and personal exchange (Cohen *et al.* (1998) as cited in Agrawal (2001)). Further research suggests that patents constitute a small percentage of the actual knowledge that is transferred between university and industry (Agrawal and Henderson 2002). This claim is supported in a study by Cohen *et al.* (1998), which found respondents perceived conferences to be more important than patents in university-industry knowledge transfer. This literature first suggests that easily measureable knowledge transfer channels, such as patents, are not always the best means to transfer knowledge. Second, it suggests that conferences are an important means to transfer knowledge, relative to the other channels.

A recent study by Cohen *et al.* (2002) suggests that different channels are used to transfer different kinds of knowledge. In a survey of various industries, data suggests that depending on the industry, different channels are of different importance. For example, 64% of respondents in the pharmaceutical industry rated meetings or conferences as "moderately" to "very" important. While 50% of respondents in the same industry rated patents as "moderately" to "very" important. 51% of respondents in the aerospace industry rated meetings or conferences to be "moderately or "very" important, by contrast, only 14% of respondents in that industry gave the same rating to patents (Cohen *et al.* 2002). The idea of industry-specific transfer channels could also hold true also in university-university knowledge transfer, and by discipline specific. For example, engineers may rely more heavily on patent data to learn/transfer knowledge,

while those in pedagogy may prefer meetings and conferences to explain in-class teaching techniques.

2.3. Conferences

At a micro-level, conferences can be seen as a series of smaller meetings, both formal and informal. Given this interpretation the success of a meeting, as defined by Haynes (1997), is achieved when the objectives are accomplished. Although informal sessions, e.g. coffee breaks, etc. may not have a clear objective defined by the organizer, many participants may expect such sessions to be used for networking. Haynes (1997), Welch (2001), and Lucas (2001) describe the components of any meeting: content, interaction, structure, and location. Content is the knowledge that is brought to the meeting, while interaction is how participants engage with each other. Structure is how the content and interaction are organized in the meeting, while location is the physical space where the meeting is facilitated. Thus achieving the objectives of any meeting depends on the efficient management of these four components.

3. Methods

3.1. Methods Employed

Given that it was an international conference, we chose an electronic survey method as our means to obtain data. The survey was in the form of a self-administered internet questionnaire that was constructed by the authors and accessible by invitation only. The organizers of the conference invited participants on our behalf, to complete a total of three questionnaires: the first a few days before attending the conference, the second a few days after the conference, and the third approximately 3 months after the conference. By administering a three-part questionnaire, we hoped to find out what participants expected from the conference, their thoughts immediately after, and their thoughts after several months. All responses were made anonymous and no personal information was retained for this study.

3.2. Study Population And Recruitment

All participants who registered for the conference were included in the study population. Participants were invited to complete each questionnaire through an email sent by the conference organizer. Since all participants submitted an email address for registration purposes, it can be assumed that most, if not all participants received the invitation emails.

3.3. The Questionnaires

The questionnaires were a mix of multiple choice and open-ended questions. Depending on how much was written in the open-ended questions, each questionnaire would have taken approximately 5 minutes to complete.

The first questionnaire gathered basic information about the respondent, including their preferred method of learning, reason for attending the conference, and how many

conferences they have attended in the past. It also asked the respondent for their expectations on:

- novelty of information presented
- usefulness of knowledge
- amount of interactivity
- usefulness of social sessions

The second questionnaire asked respondents how the conference measured against their initial expectations. Questions addressed the:

- novelty of information
- quality of information overall
- quality of information at specific sessions
- level of personal involvement
- social aspects of the conference

The third questionnaire focused on knowledge transfer and application. Respondents were asked whether they gained new knowledge from the conference, and if so, what kind of knowledge. They were also asked to assess this conference against other conferences and sources of competence development. Several questions addressed how knowledge was transferred to respondents, and how they have applied the knowledge they gained. The questions dealing with knowledge application included a text box for respondents to elaborate on their answers.

4. Results

Although all participants received invitations to participate in the three questionnaires, only 7 respondents replied to all three, 14 replied to two of the questionnaires, and 29 replied to only one of the questionnaires. The post-conference questionnaire received the greatest amount of replies, while the other two questionnaires received slightly less. The response rates were as follows: 4% answered all three questionnaires, 10% answered two of the questionnaires, and 18% answered only one questionnaire. Overall, 32% of participants answered at least one of the questionnaires.

4.1. Major Findings From The Pre-Conference Questionnaire

Most respondents preferred to learn new concepts by reading about them. The second most popular way of learning new concepts was “Learning by doing”. The least popular approaches to learning new concepts were through verbal or visual presentation.

When respondents were asked about their expectations of interactive sessions, an equal number of respondents expected a high degree personal involvement, as did those who

expected no personal involvement. Slightly fewer participants expected a medium degree of involvement.

4.2. Major Findings From The Post-Conference Questionnaire

For most respondents the conference presented novel information that met or exceeded expectations. While only a small number felt the information was less than expected.

In addition to the novelty of information presented, most respondents found the quality of information to be as expected and better than expected. Conversely, a small number found the information to be far better than expected, and less than expected.

When asked how respondents felt about personal involvement in interactive sessions a majority said they found it to be the same or better than expected. A small number found that it was less than expected or far better than expected.

4.3. Major Findings From The Follow-Up Questionnaire

Most respondents found the knowledge gained was mostly theoretical, while a small number found it was mostly practical. See Figure 1.

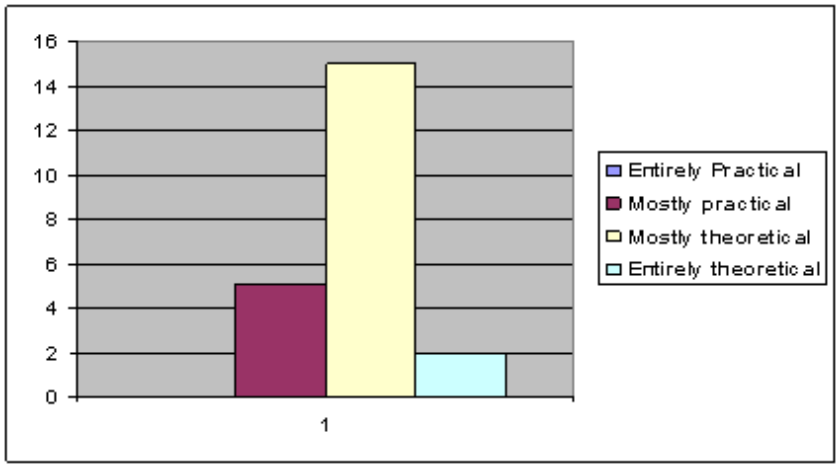

Figure 1: "The Knowledge That You Gained Was…"

When asked about sources of valuable knowledge, respondents were split between formal and informal. See Figure 2.

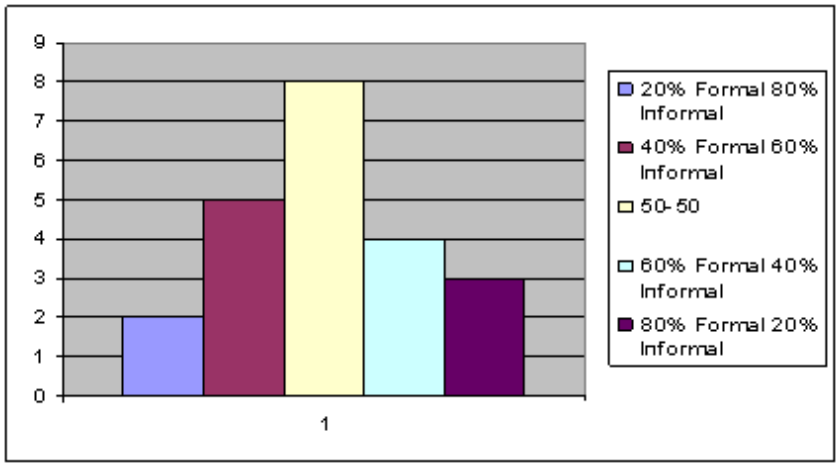

Figure 2: "Overall, If You Were To Estimate Where You Got The Most Valuable Knowledge From The Conference"

Interactive sessions were rated to be the most valuable venue for transferring knowledge, followed closely by lectures. Social functions and workshops proved the least conducive to knowledge transfer. See Figure 3.

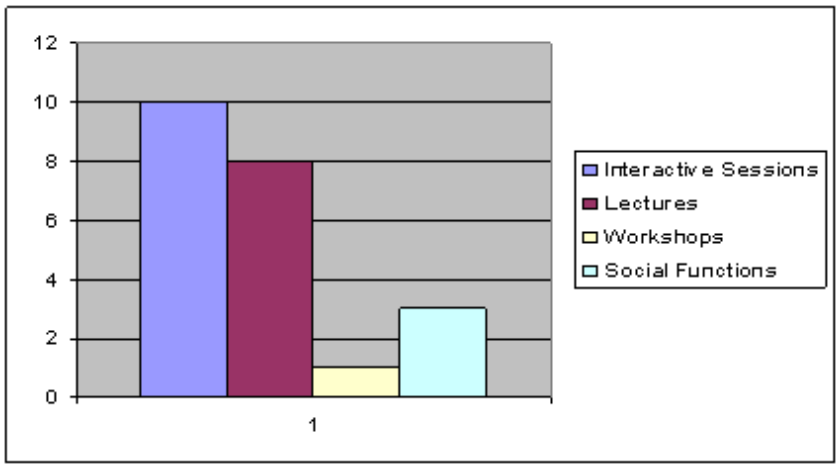

Figure 3: "Specifically, Which Kind Of Sessions Proved To Be Most Valuable In Transferring Knowledge"

Respondents were also asked in what way the knowledge was transmitted to them, and were allowed to select multiple sources. Speeches proved to be the most effective means to transmit knowledge, while participation in discussions was the next most effective. Formal literature and visual devices were ranked considerably lower. See Figure 4.

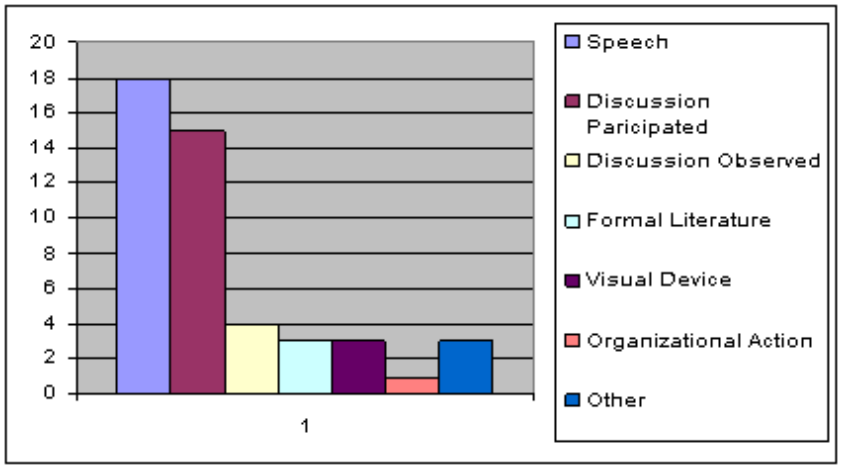

Figure 4: "By What Means Was This Knowledge Transmitted To You?" (Multiple Selections Permitted)

When asked about applying the knowledge respondents gained at the conference to other colleagues, a majority claimed they were able to transfer the knowledge to a limited degree while fewer claimed to have transferred the knowledge often. See Table 5.

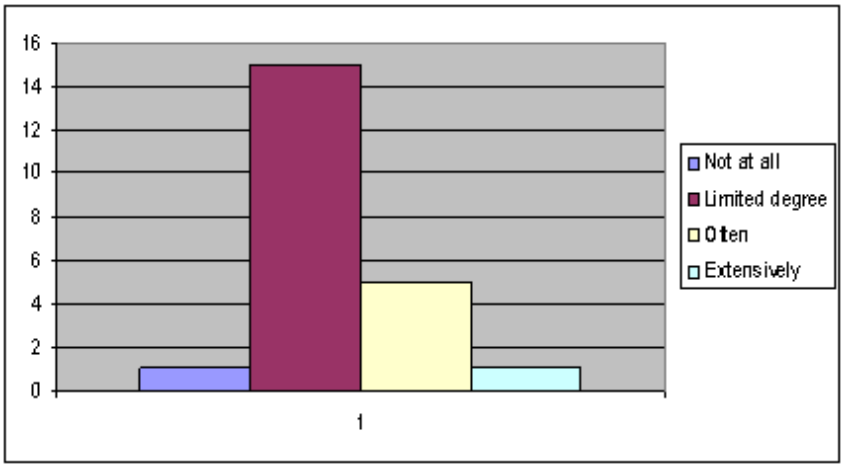

Figure 5: "Have You Transferred/Communicated The Knowledge Gained From The Conference To Colleagues?"

The final section of the questionnaire asked respondents two questions, which allowed them to elaborate on their answers. The first, "Did the acquired knowledge lead to the generation of new ideas related to your work/studies/research?" To which respondents overwhelmingly answered "yes." The second question, "Did the acquired knowledge enhance your ability to detect, evaluate, and use innovations in your working environment?" was less defined – although most answered "yes"; some indicated lack of clarity in the question.

Did the acquired knowledge lead to the generation of new ideas related to your work/studies/research?

Of the respondents who answered "yes" to this question, the ideas in their written responses can be summarized as follows:

- new techniques
- understanding of different analytical approaches
- new theories/methods
- developing ideas
- initiation of co-operative projects
- re-examining current work
- new data

Of the respondents who answered "no" to this question, the ideas in their written responses can be summarized as follows:

- no immediate impact; latent ideas may develop

Did the acquired knowledge enhance your ability to detect, evaluate, and use innovations in your working environment?

Of the respondents who answered "yes" to this question, the ideas in their written responses can be summarized as follows:

- discovering the importance of current issues
- incremental improvements
- application of effective presentation skills

Of the respondents who answered "no" to this question, the ideas in their written responses can be summarized as follows:

- lack of practical knowledge gained
- no immediate application – potential for use later on

5. Discussion

This study had two main objectives. One objective was to test a hypothesis that lecture settings and formats may influence the efficiency of knowledge transfer. The other main objective was to test a methodology based on three questionnaires (administered pre,

immediately after, and again after three months), and comprising of a mix of multiple choice and open-ended questions.

The results show that participants rate different formats differently, i.e. that the format is perceived to influence the transfer of knowledge. If the different formats had no importance as is, it could be assumed that the various types would be given an equal rating – which was not the case.

The results also give support to the original hypothesis, that interactive formats may be more efficient than strictly one-way communication. The participants rated interactive sessions as most valuable. Workshops were rated as least valuable. This finding was unexpected. However, workshops may be designed for specific purposes other than just transfer of pre-existing knowledge (exploring, experimenting, problem solving, idea generation, or interpretations of specific data may be some examples of workshop tasks).

Participants regarded interactive sessions as efficient – this was most obvious in the third, follow-up questionnaire. It could be hypothesized that the transfer format and efficiency may also influence the retention of new knowledge.

Each of the three questionnaires provided value. The pre- questionnaire gave information on expectations and preferred method of learning. The post- questionnaire captured fresh and overall impressions, as well as social aspects. The follow-up questionnaire captured information about knowledge transfer and knowledge application. Further, the real value and usefulness of knowledge may only be obvious after a period of time. Also, comparisons between the post- and follow-up questionnaires may indicate how lecture formats may influence the retention of knowledge.

However, there are limitations to this study. First, only a third of all participants answered at least one of the questionnaires, and even less answered all three. Participants' email addresses could have been used for registration purposes only, and checked only on occasion. Second, answering the questionnaire on three occasions could have been too burdensome for some. Third, the conference was relatively small, and was not organized to use particular interactive formats.

It is conceivable, and in fact highly likely, that the quality of a presentation, how an interactive discussion is led, or how a workshop is organized, may be more important than the format per se. Further, the expectations, personal learning style, and attitude of the participant may influence the efficiency of knowledge transfer. However, conferences comprise many learning occasions and many participants, which may possibly even out some of these aspects.

The type of conference may also play a role. The topic of this conference was linguistics, which may generate an assumption that written material might have a special significance (as compared to an image-oriented conference, for example photography, image processing, etc.) The findings from the pre-conference questionnaire could support this assumption.

5.1. Application Of Findings

Conferences have a long tradition of conveying knowledge, providing both opportunities to present recent findings and give context to such knowledge. However, today knowledge can be accessed by many means. The most striking example is Internet-related systems, providing enormous opportunities for publishing, searching, and finding information. Scientific, technical, and social news is often presented rapidly through web-based media. Many fora and media are to an increasing extent interactive, for example blogs and web communities. It is possible to give comments and discuss alternative views. Another example is wiki technology that makes it easier to discuss and comment. New applications provide novel means through social media, people can engage on a broader scale, in a colloquium not limited to experts and specialists within particular fields of knowledge. Younger people may be more familiar with web-based sources of knowledge than with traditional formats for knowledge transfer. Further, professional and private networks, both on the web and through physical meetings, have become important sources of information and knowledge.

Conferences are attractive, for many reasons. One example is the value of focus, i.e. the advantage of getting away from the ordinary daily routine and being able to concentrate on issues of particular interest. Another is the social aspect: people get together and interact, and many conferences provide social program in addition to the regular program. On the other hand, conferences are held at particular dates – people need to wait for them to occur, and may not always have opportunity to participate for various reasons – typically due to conflicting commitments and task with higher priority. Alternative sources, such as the web and personal networks, may be available all year round, and often 24/7.

Financial issues must also be considered; today, there is an increased focus on efficiency and costs. Conferences are expensive, both in direct cost for participation, accommodation, and travel, and indirectly in time. Therefore, it is increasingly important to evaluate the efficiency of knowledge transfer. This includes the value perceived in immediate relation to a conference, i.e. if time and money are well spent. Conferences should also provide long-term value, as reflected in retention of gained knowledge, and the practical use of it. In particular, it is important to consider how to attract a new generation conference attendants. Young people may have limited experience of conferences and instead have extensive experience of Internet sources of information.

In summary, new technologies and media constitute alternatives to traditional conferences. Therefore, conferences may need to consider their competitive advantages, compared to other sources of knowledge. Examples are nice locations and good opportunities for excursion and social events. However, in our view the most important aspects is the efficiency of knowledge transfer, being the *raison d'être* for conferences. In order to compete successfully with other means of knowledge transfer, conferences may need to:

- Evaluate the efficiency of knowledge transfer
- Devise novel formats for knowledge transfer

5.2. Evaluate The Quality And Efficiency Of Knowledge Transfer

The task includes devising novel means of evaluations that could provide both efficient and convenient ways to understand which factors that is most important for participants. One example is comparisons between formal lectures and interactive sessions. Further, the means used for evaluations must be well fit for the purpose, and easy to use both for conference participants and administrators; technology should be simple and attractive to use. For example, new applications in mobile phones or iPod could be developed.

We have created a conference taxonomy (Table 2) that can be used to categorize the different kinds of meetings/conferences and their level of interactivity.

	Level of interactivity	**Characteristics**
Workshops	High	Where participant are interactive and discuss also between themselves; participants may be divided into smaller groups to work on topics and then reassemble as a whole to discuss together
Semi-interactive Lectures	Moderate	Where the audience is invited and even expected to participate in the discussion.
Traditional Lectures	Moderate/Low	Mainly between experts – but audience may participle with questions (often written, sent beforehand or during the session).
Panel Discussions	Low/None	Mainly between experts – but audience may participle with questions (often written, sent beforehand or during the session).

Table 2: A Conference Taxonomy

In order to facilitate future evaluations, we propose a matrix (Table 3) for evaluating knowledge transfer at meetings/conferences.

	Quality of talk	Quality of format (logistics)	Desire to make it more interactive	Desire to make it less interactive	Desire to combine with web-based systems	Ranking between formats (as in left column)	Caparison to the we as knowledge source
Traditional lecture							Better/worse
Semi-interactive							Better/worse
Panel							Better/worse
Workshop							Better/worse

Table 3: Knowledge Transfer Evaluation Matrix

Also, motivation for filling out questionnaires should be considered, and may be a field for innovations. Conceivable examples are competitions, lotteries (one out of 10 respondents?), and acknowledgements for most valuable comments. Tokens of appreciating may be contemplated – however a caveat: it is important to avoid buying evaluations. Another idea is reduced cost for those that take active part in evaluations (compare early bird registration, at lower cost). Reward feedback post-conference, for example by credits for next conferences, could be an alternative.

Openness is valued, and in many contexts expected. An interesting option is to make the information accessible for participants, for example by implementing a conference blog and/or wiki. On the blog/wiki participants could read about results of pre-, post and follow-up conference questionnaires (even if there is risk that a competitor could read it). Such solutions would signal transparency and encourage comments (that may also be important for positive expectations). Such transparency is in tune with modern knowledge.

Expectations could be used to modify the program or particular aspects, based on comments and requests. The information may be important for both organizers and lecturers.

5.3. Develop/Try Out New Formats

Examples are study material and questions distributed and available before sessions, integration of technology allowing interactive communication, capture of discussions, and distribution of notes after sessions. Ideally, applications used to evaluate knowledge transfer could also make the transfer more efficient; example could be pre- conference questionnaires designed so that they would also prepare participants for conference topics. Further, those post-conference questionnaires could help to remind and update knowledge gained at the conference.

Combinations of new technology and traditional lectures could be considered, with the aim of making knowledge transfer more efficient. Helping traditional conference participants becoming more familiar with modern technology would be an added advantage.

5.4. Caveats

A traditional format, with a very good and skilled lecturer, will be appreciated more than an interactive format that is not well executed. Of course, the opposite may apply. Therefore, when comparisons are done quality must also be considered (factored in). However, it is not easy to estimate quality, particularly in numbers.

Last, we would like to mention that in our view, conferences do have particular and significant values that Internet or other similar sources of knowledge cannot substitute for. We would argue that competition from emerging and existing alternatives should be viewed as a positive source for continuous improvement. Further,

we believe that there are both opportunities, and a need for innovations related to conferences and efficient knowledge transfer.

6. Future Trends

Based on the results of this exploratory study, we have developed and refined the questionnaires further. We also suggest that evaluations can be done directly after different types of sessions (using short and easy-to-fill-out questionnaires), as a complement to the three main questionnaires. We would appreciate contact for studies of other conference, in various fields and contexts.

7. Conclusion

We regard the study as exploratory, and prefer to view the results as qualitative, in particular when considering the limited response rate. Therefore, we also find a few overall indications to be most valuable. In summary, the results from this exploratory study suggest that interactive formats may be more efficient than one-way communication. In particular, the responses indicates that participants found workshops to be more useful than traditional lectures but also that speeches were viewed as somewhat more useful than participating in discussions. Further studies may clarify these issues. For example, the influence of context, topic, quality of presentations, and educational level of participants may be of interest to study more in detail.

This study indicates that the methodology of using pre-, post-, and follow-up questionnaires can be used for the evaluation of knowledge transfer in this context. Such information may also be valuable for organizers of such conferences.

8. References

Agrawal, A. (2001). University-to-industry knowledge transfer: literature review and unanswered questions. *International Journal of Management Reviews*, 3(4), 285-392.

Agrawal, A., Henderson, R. (2002). Putting patents in context: exploiting knowledge transfer from MIT. *Management of Science*, 48(1), 44-60.

Cohen, W.M., Florida, R., Randazzese, L., Walsh, J. (1998). Industry and the academy: uneasy partners in the cause of technological advance. In Noll, R.G. (ed.), *Challenges to Research Universities*, Ch. 7. Washington, DC: Brookings Institute Press.

Cohen, W.M., Nelson, R.R., Walsh, J.P. (2002). Links and impacts: the influence of public research on industrial R&D. *Management Science*, 48(1), 1-23.

Haynes M.E. (1997). *Effective Meeting Skills*. London, UK: Kogan Page.

Lam, A. (2000). Tacit Knowledge, Organizational Learning and Societal Institutions: An Integrated Framework. *Organization Studies*, 21(3), 487-513.

Lucas, G.F. (2001). The Art of Effective Meetings – Planning is the Key. Proceedings of the *2nd International Workshop on Engineering Management for Applied Technology (EMAT'01)*, 89-92.

Welch, S.J. (2001). Here, there, & everywhere. *Successful Meetings*, 50(9), 76-79.

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