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## Is a Picture Worth a Thousand Words? Using Mind Maps to Facilitate Participant Recall in Qualitative Research

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## Is a Picture Worth a Thousand Words? Using Mind Maps to Facilitate Participant Recall in Qualitative Research

### Abstract

Mind maps may provide a new means to gather unsolicited data through qualitative research designs. In this paper, I explore the utility of mind maps through a project designed to uncover the experiences of Latvians involved in a legal technical assistance project. Based on a sample of 19 respondents, the depth and detail of the responses between the groups were compared. Those who first completed mind maps identified a greater number of unique concepts and provided more in depth responses about their experience in later interviews. Participants suggested that by first completing a mind map, they were better able to recall, organize, and frame their reflections of past experience. The findings of this analysis of using mind maps provide a justification for more detailed exploration about the utility of mind maps for qualitative research designs.

### Keywords

Mind Maps, Data Gathering, Qualitative Research, and Legal Technical Assistance

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## **Is a Picture Worth a Thousand Words? Using Mind Maps to Facilitate Participant Recall in Qualitative Research**

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*Mind maps may provide a new means to gather unsolicited data through qualitative research designs. In this paper, I explore the utility of mind maps through a project designed to uncover the experiences of Latvians involved in a legal technical assistance project. Based on a sample of 19 respondents, the depth and detail of the responses between the groups were compared. Those who first completed mind maps identified a greater number of unique concepts and provided more in depth responses about their experience in later interviews. Participants suggested that by first completing a mind map, they were better able to recall, organize, and frame their reflections of past experience. The findings of this analysis of using mind maps provide a justification for more detailed exploration about the utility of mind maps for qualitative research designs. Key Words: Mind Maps, Data Gathering, Qualitative Research, and Legal Technical Assistance*

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Since the 1950s increased internationalization in the economic, political, and social spheres through multiple forms of globalization has led to greater interpersonal cross-cultural contact. Whatever the opportunities to learn and expand personal, professional, and business networks, it has become clear that cross-cultural training can facilitate more effective interactions (Black & Mendenhall, 1990). An area of specific immediate interest is interactions that occur through international development assistance projects. Some argue for development assessments that solely focus on quantifying development outcomes (Fisman & Miguel, 2008), but too often this data sidesteps the views of those for whom the reforms are purportedly designed. Because development projects operate at the intersection of economic, legal, environmental, social, and cultural aspects of a society (Morrison, 1998), there has been a growing recognition of the importance of translating intercultural mis-understandings in project design, delivery, and research (Timonen, 2008).

Qualitative research provides an important means to do so. By focusing on individualistic accounts of knowledge, experience, and perception, meaning is discovered through social interactions and the ways in which an individual constructs, frames, and describes one's past. Focused on precision (Winter, 2000) and credibility (Hoepf, 1997), qualitative researchers have begun to acknowledge that the approach chosen by the researcher shapes subsequent research interactions (Feyerabend, 1978). While the trend toward reflexivity (Macbeth, 2001) has helped to explicitly outline the role of the researcher in qualitative research, other researchers are developing new means of data collection. These include vignette responses, subject-operated cameras/videos/sound recordings, focus groups, and journaling (Wheeldon & Faubert, 2009). Mind maps may

offer yet another means. By allowing a means for participants to break out of the rehearsed narratives of their daily lives (Hathaway & Atkinson, 2003), the use of maps may facilitate more detailed, and in-depth reflections of experience. Maps may provide an entry point into the unadulterated views of participants. Through the graphic construction of experience, researchers can get another view of how participants see the world (Wheeldon & Faubert). Maps may allow for a means to share experience less mitigated by linguistic constructions, culturally grounded understandings, and mutual accommodations (Habermas, 1976).

Based on data collected from 19 Latvian project participants over two years, I argue that mind maps provided a useful means for participants to frame their experience of a Canadian-funded legal reform project. Through a variety of means designed to compare the depth and detail of reflections between both those who did and did not complete concept maps, it appears that mind maps assisted participants by promoting and accessing past memories. Based on interviews with those who completed a mind map, there is support for the view that through the creation of a map, participants can better organize their thoughts through the graphic representation of experience. They may be especially useful when conducting cross-cultural research in which open communication may be complicated by cultural, linguistic, or social misunderstandings. While maps may offer a unique solution to these sorts of dilemmas, little is known about their specific utility and overall value in qualitative data collection.

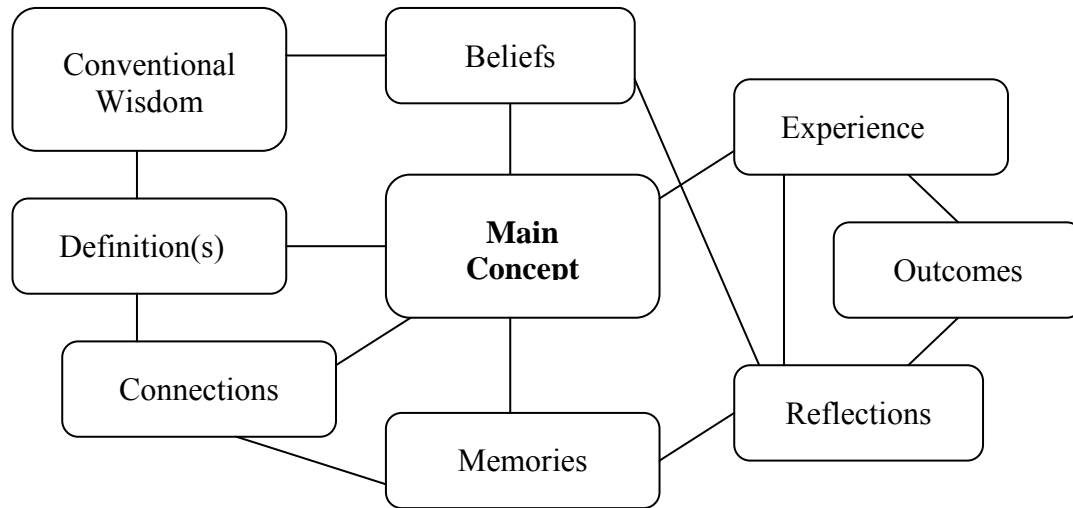
### **Understanding Mind Maps**

Mind maps are diagrams used to represent words, ideas, and other concepts arranged around a central word or idea. Mind maps are structurally more flexible than other sorts of maps and present ideas in a variety of ways (Buzan, 1974). While they may offer a new approach to the complexities associated with quantifying qualitative research (Sandelowski, 2001), of interest in this paper is how mind maps can be used in multi-stage qualitative data collection. Maps can facilitate participant recollection, while acknowledging the importance of individual experiences in the graphic construction of meaning. Figure 1 provides a hypothetical example.

The use of maps to demonstrate how people visualize relationships between various concepts (Kommers & Lanzing, 1997) is of increasing interest to social science researchers. A multitude of peer-reviewed articles have been published on their application and use (Nesbit & Adescope, 2006) and mind maps have been used to assess medical education (Farrand, Hussain, & Hennessy, 2002) and cognition in university students (Pressley, Van Etten, Yokoi, Freebern, & Van Meter, 1998). It has also been suggested that mind maps may provide a valuable means to collect more personalized and individualistic data from research participants (Tattersall, Watts, & Vernon, 2007; Wheeldon & Faubert, 2009). Based on the theoretical starting place generally associated with qualitative research, meaning emerges through social interactions, personal histories, and the exploration of individual's experience (Creswell & Plano Clarke, 2007). Although widely used data gathering techniques for human subjects research such as participant observation, interviews, and focus groups are still important (Wolcott, 2001), other techniques may provide a means for participants to personally construct a graphic representation of their experiences (Wheeldon, 2010). In this way, linked concepts can

uniquely demonstrate how participants connect knowledge and experience (Daley, 2004). Using maps in this way may provide a means to prompt research participants to consider past experience in more depth and detail (Legard, Keegan, & Ward, 2003).

Figure 1. A Simple Mind Map



While interest in maps in the social sciences is increasing, in general there is less specific research on mind maps than concept maps (Wheeldon & Faubert, 2009). One noted challenge is that many prior studies appear to conflate concept, knowledge, cognitive, and mind maps without differentiating between them (Nesbit & Adescope, 2006). Yet important differences exist between the types and mind maps may be better suited to qualitative research because they provide more flexibility than concept maps for researchers interested in using maps in different sorts of research designs (Wheeldon & Faubert).

My own experience using mind maps has evolved from using them in the classroom, to exploring their use as part of various research projects. One research project of interest was based on my experience working on an international justice reform project in Latvia. By using mind maps to collect data, my PhD dissertation focused on how Latvian participants perceived a Latvian-Canadian project that resulted in that country's first probation service. Through this project I explored how Latvian participants perceived components of capacity building and training and what lessons might be learned from their experience. While my findings validated, built upon, and in some cases challenged accepted practice, it represented but one approach to understanding the complications inherent in the legitimization of transnational juridical norms (Wheeldon, 2009).

In that project, one of my main concerns was that my experience as project manager on the Latvia project and others in the region could influence how I saw the value, importance, and challenges inherent in cross national collaborations. To address this concern I considered how mind maps could offer a means to gather initial data and then develop subsequent interview questions based on themes identified by participants themselves (Wheeldon & Faubert, 2009). This paper explores in more depth how mind maps can be used in qualitative research to gather unique and individual data from

participants. By comparing data from participants who did and did not complete a mind map, I argue that those who first completed mind maps identified a greater number of unique concepts and provided more in-depth responses about their experience in later interviews.

### **Using Maps in Practice: Design, Data Collection, and Analysis**

The Latvian Legal Reform Project (LLRP) was a 20-month initiative funded by the Canadian International Development Agency (CIDA). It ran from 2002 to 2004 and offered targeted legislative support, institutional capacity development and human resources training to the Latvian Ministry of Justice as it established the National Probation Service (NPS). Ministry officials developed new laws, amended existing laws, trained staff, assisted in policy development, and provided support to leading officials from other related Latvian ministries. The Latvian Probation Service established in 2003 has since grown year by year in number of staff, programs, and services delivered (Jurevičius, 2008). In general, it is considered one example of successful programming in the region (Caldwell, 2005; Luksenaite, 2005).

In this study, approved by the IRB at Simon Fraser University (SFU), participants were identified based on the level of their involvement in the Latvian Legal Reform Program (LLRP). Inclusion in the study required that all participants had travelled to Canada on a study tour, had attended at least three training sessions in Latvia, and were still involved with the NPS in 2007. These rather strict inclusion criteria ensured that participants had been involved in the project in a substantial way and could still be located and interviewed. This process resulted in the identification of 24 potential participants; of these, 19 participants agreed to participate in the study. Data collection was complicated by distance between North America and Latvia and the variance in linguistic capacity between both the Latvian participants and myself. One way around this challenge was the use of a mind map methodology (Wheeldon, 2009). Originally the study was designed to collect data through four stages.

#### **Stage 1 Data Collection: Mind Maps**

The first stage of data collection, involved the completion of an individual mind map that detailed a participant's experience of the Canadian training during the LLRP. A translated example map<sup>1</sup> was provided to all participants along with instructions that described mind maps as demonstrating the variety of ways in which a concept, experience, or perception can be understood or presented. Participants were encouraged to simply create a map of the experience connecting related concepts and were explicitly told that there was no right answer and no such thing as a good or bad map. Participants were asked to fill out a cover sheet including spaces provided for gender, region, and probation role and sign an informed consent document, assuring the confidentiality of their responses. Once their map was completed, participants were asked return it to me

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<sup>1</sup> The example map was Lanzig's *St. Nicholas* map presented in: Kommers, P., & Lanzing, J. (1997). Students' concept mapping for hypermedia design: Navigation through World Wide Web (WWW) space and self-assessment. *Journal of Interactive Learning Research*, 8(3-4), 421-455.

by email or fax. In addition to the translated example map, the following instructions were provided to all participants:

1. Maps can demonstrate how people visualize relationships between various concepts.
2. Maps do not require complete comprehensiveness: however, the map should reflect key experiences and perceptions related to your experience of the project.
3. You are encouraged to include both challenges and successes (where applicable) in the creation of your maps.
4. Please limit your map to one page.

**Stage 2 Data Collection: General Interview Questions**

During the second stage of data collection, participants were asked general questions during face-to-face interviews in Latvia during a one-month research trip to Latvia. The general interview questions were broad, open-ended and probed both positive and negative experiences. For those within the map group, question number three probed the experience of completing a concept map. All 19 participants were asked the questions in Table 1.

*Table 1.* General Interview Questions

Question Number	Question Text
1.	Describe your most positive or memorable experience with Canadian trainers?
2.	Describe your most negative or challenging experience with Canadian trainers?
3.	What if anything did you learn through the mind map exercise?
4.	How important was the role of the translator/translation within the training sessions?
5.	Have you remained in touch with any of the Canadian trainers?
6.	What would you say the biggest result of Latvian Canadian cooperation was?
7.	What would you say was the biggest challenge of Latvian Canadian cooperation?
8.	Was working with Canadians different from working with other international experts?
9.	If you could change one thing about Canada’s involvement with Latvia, what would it be?
10.	Anything else you’d like to add?

**Stage 3 Data Collection: Specific Follow-up Questions**

In addition to the general questions, additional questions were asked of all 19 participants. Based on a pilot study completed during my PhD coursework, a dichotomy appeared in the construction of the maps themselves. Based on these differences, those

who identified formal training tools such as assessments, reports, and guidelines more prominently in earlier data collection stages were asked about informal training processes as described in Table 2. Those who identified informal training processes such as role-plays, training exercise, and networks more prominently in earlier data collection stages were asked about the more formal elements here as described in Table 3.

*Table 2.* Specific Questions for Training Tools Group

Question Number	Question Text
1.	Did you participate in a study tour to Canada? How did it assist or hinder training? What was your most memorable time there?
2.	What, if anything, was the role of the pilot projects in assisting the development of probation in Latvia?
3.	What, if anything, was the role of local coordination councils in assisting the development of probation in Latvia?
4.	What was the most important contribution Canada made through project funding to the development of probation in Latvia?
5.	Anything else you'd like to add?

*Table 3.* Specific Questions for Training Approaches Group

Question Number	Question Text
1.	What were some of the most effective training seminars you attended? What were some of the least effective?
2.	What made a training seminar effective? How did different training styles affect learning?
3.	Name some of the exercises you recall from the training seminars?
4.	Do you wish that the Canadian training had concentrated on other areas relevant to your work?
5.	Anything else you'd like to add?

#### **Stage 4 Data Collection: Reflection and Summation**

Within the general and specific question sets, I followed directive questions with a request that participants sum up their interviews. Although perhaps simplistic, by asking: "Is there anything else you'd like to add?" participants were provided the opportunity to reflect upon the experience, sum up their interviews, and to identify areas not previously addressed.

#### **Research Planning and Data Collection Realities**

Originally I had planned that the maps in the first stage of data collection would be completed and returned by participants using email or fax between September and December 2007. I assumed this approach would have allowed me some time to analyze the maps ahead of my six-week research trip to Latvia in the Spring of 2008. However, by January of 2008, only ten participants had completed and returned the mind map as



requested. The nine other participants who had agreed to be part of the project had either not completed or not returned their maps. At the suggestion of senior colleagues, I decided to change my methodology based on a more pragmatic approach to data collection (Felizer, 2010). This more flexible approach allows that the challenges of research on the ground ought not be held hostage by idealized research designs. In this project, based on this more iterative approach to data collection, I decided to split the participants into two groups.

Instead of gathering data for all participants through four distinct stages, of the nine participants who had agreed to participate but had not yet completed maps, four would be randomly selected to complete a map during my 2008 spring research trip to Latvia. The five other participants would participate as the non-map group and although they would not be asked to complete a mind map, they would participate in all other stages of data collection, as listed above. In all, the map group was composed of 14 participants: 11 were female and three were male, 12 were probation officers and two were headquarters staff, eight were from the capital city Riga and six were from outside regions. The non-map group was composed of five individuals: three were female and two were male, three were probation officers and two were headquarters staff, two were from the Riga and three were from outside regions.

While ultimately I decided to report only the findings of those who had completed maps in my dissertation, the comparison between these groups offers a useful insight into how different sorts of data collection might influence the depth and detail of the participant responses. While not initially envisaged, this iterative approach has allowed me to pursue another sort of map-based analysis through this paper.

### **Analysis and Findings: Counts, Detail, and Participant Reflection**

While in past projects, the maps themselves served as a valuable source of data (Wheeldon & Faubert, 2009), in this study I focused on the responses of participants through notes I took during the interviews in Stage 2, 3, and 4 data collection. In addition to overall summaries of participant responses to the general and specific question sets, I also focused on capturing direct quotes from participants, asking them to repeat answers where necessary. These notes were entered each evening into a color-coded excel spreadsheet to facilitate comparisons among participants and the map and non-map groups. The data collected provided a new understanding of the project based on the experiences of the Latvian participants (Wheeldon, 2009), and splitting the group allowed me to explore the specific utility of the mind maps. Of specific interest to me in this analysis was whether the completion of a map would impact the depth and detail of individual reflections. By combining an analysis of the presence and frequency of unique individual concepts, along with the specificity of participant reflections identified in collection Stages 2, 3, and 4, I was able to explore broader comparisons between these groups.

The notion that qualitative researchers ought to consider the value of numeric based means of analysis in their research is controversial. As Sandelowski (2001) points out, a perception exists that real qualitative researchers do not count. While simplistic, given the utility of numbers to present what is known about a problem, and describe research samples, this aversion to numbers speaks to broader political and ideological

differences between qualitative and quantitative research agendas (Jick, 1979). While the hallmark of past academic debates, it seems quaint and somewhat outdated given the complexity of emergent research problems social science researchers face today. Instead of propagating anti-numeric myths, qualitative researchers would do well to use numbers to showcase the labor and complexity of qualitative work and examine in more detail the meanings that may emerge from qualitative data (Sandelowski). While the over-reliance on numbers and counts may be problematic, an under reliance may be just as dangerous.

By comparing the depth and detail of the responses between groups, my analysis provided a means to understand how the mind maps may have impacted data collection. In this study depth and detail were defined using the following criteria. Detail is related to the number of unique concepts provided within all interviews, including the reflective or summative responses in Stage 4 data collection. By contrast depth is connected to the nature of the responses given in Stage 2 and 3 data collection, including the length of responses, complexity of connections made and specific examples provided. In addition, by providing some of the responses given in Stage 4 data collection, I hope to show how numeric notions of detail can support broader interpretive notions of depth. Finally, to provide context to the quantitative and interpretive analysis, participant responses to the role of mind maps (Question 3 in Stage 2 data collection) were compiled, compared, and common themes identified. Including these comments ensured that participant's views of the mind map exercise figured prominently in the findings of the study.

One finding of interest is that the completion of mind maps led to an overall increase in concepts identified by participants. As suggested by Tables 4, 5, and 6, participants who completed a map identified more unique concepts through the data collection stages than those who did not complete a map. On average, those who completed a map identified seven more concepts than their non-map colleagues. In this way, one could say the map group provided more details about their overall experience on the project.

*Table 4.* Total Number of Unique Concepts Identified By Map Group

<b>ID</b>	<b>Map Status</b>	<b>Counts</b>	<b>ID</b>	<b>Map Status</b>	<b>Counts</b>
1	Map	24	8	Map	5
2	Map	26	9	Map	12
3	Map	24	10	Map	11
4	Map	19	11	Map	22
5	Map	17	12	Map	17
6	Map	4	13	Map	14
7	Map	21	14	Map	16

*Table 5.* Total Number of Unique Concepts Identified By Non-Map Group

<b>ID</b>	<b>Map Status</b>	<b>Counts</b>
15	No Map	10
16	No Map	11
17	No Map	9
18	No Map	5
19	No Map	10

Table 6. Average Number Of Concepts Identified By Map And Non Map Groups

Map Status	Average Number of Concepts
Map	16.57
No Map	9

In addition, as suggested by Tables 7 and 8, those who completed maps were almost twice as likely to offer reflective and summative answers as part of Stage 4 Data Collection. The increased willingness to offer more conclusionary and unprompted reflections suggested to me that these participants were more engaged in the interview process, and more interested in sharing their unique and individual perspectives (Legard et al., 2003).

Table 7. Participants Who Completed Stage 4 Data Collection (Map Group)

ID	Map Status	Stage 4?	ID	Map Status	Stage 4?
1	Map	Yes	8	Map	Yes
2	Map	Yes	9	Map	Yes
3	Map	Yes	10	Map	No
4	Map	Yes	11	Map	Yes
5	Map	No	12	Map	Yes
6	Map	Yes	13	Map	Yes
7	Map	No	14	Map	No

Table 8. Participants Who Completed Stage 4 Data Collection (Non-Map Group)

ID	Map Status	Stage 4?
15	No Map	No
16	No Map	Yes
17	No Map	No
18	No Map	Yes
19	No Map	No

The initial analysis as presented above relied upon more quantitative assumptions about seeing concept counts as a means to demonstrate detail. Perhaps problematic for qualitative purists, through a more traditional interpretive analysis, the depth and detail of participant responses were also explored. By reviewing the responses in Stages 2, 3, and 4 of data collection, those who completed maps were more likely to provide additional information about their experience(s) overall, including longer explanations, an increased number of connections between concepts, and examples in both the general and specific question sets. For example, those in the map group provided more details about the positive aspects of training including the “practical aspects of the seminars,” “connections between agencies” that were established there, and the importance of the “personalities” of the Canadians involved in the project. They were also more likely to suggest ways to improve the project, such as a desire for more programming on “legislative changes,” “office management,” and cultural differences regarding “. . .

Latvian people's resistance to change." The map group was also more likely to draw broader connections between the project and other reform efforts in Latvia. When asked about the most important contribution the project made, participants who had completed a map suggested the project connected social work, education, and/or community involvement with justice reform. By contrast, participants who did not complete a map simply mentioned the development of the probation service as the biggest outcome.

As noted above, participants who completed maps were also more likely to complete Stage 4 data collection. This stage offered an important and unsolicited opportunity for participants to share anything they wished about the project. As such it proved an important way to understand how participants saw the project in sum. Those who completed the maps offered additional insight into the project by focusing on the importance of "team building between Latvians," the role of the study tour in "altering views about justice" and the need for flexibility so that training activities could be responsive to "needs on the ground."

Finally, in addition to quantitatively based notions of detail and qualitatively based notions of depth, participants themselves provided some useful reflections on the utility of mind maps in this project. Maps were described as a "useful way to see experience," "easy to compile" and provided them with "a new way to see the system of the project." Some suggested this was because making a map "helped them to remember events from years ago" and "organize their thoughts about the experience systematically." Others suggested as a visual aid it helped put the experience in "context" and provided a "clearer view" by looking at events again, "...realizing how much had happened." For others, making maps was not new to them, and was done in their professions to assist individuals to "...focus on the key experiences, concepts, and connections."

### **Discussion and Limitations**

The use of mind maps in qualitative research is relatively new and as such, this research is somewhat exploratory. Yet, the re-emergence of maps in social science research has occurred at a time when there appears to be a desire to develop data collection methods that are either more explicitly user-generated, or which are less influenced by what may be *sui generis* research/participant interactions (Wheeldon & Faubert, 2009). Since 1997, maps have been used with increasing frequency in fields such as health, education, sociology, and engineering (Nesbit & Adescope, 2006). Because maps offer a unique way for research participants to represent their experiences, they may provide a means for individuals to think more clearly by avoiding the assumptions built into language (Korzybski, 1933).

This view is based on the acknowledgement that people learn in different ways and think using a combination of words, graphics, and images. For qualitative researchers the use of interviews as the sole means of data collection may be relying on psycho-linguistic assumptions about the role of syntax, semantics, and context to guide their construction of meaning (Cassirer, 1946). Because people live their lives both in *their own head* and as part of a social, cultural, and linguistic collective (Habermas, 1976), consciousness is both something that people experience on their own and through their interactions with others (Husserl, 1970). Maps may provide one strategy to break

out of conventional and linguistically limited representations of experience, rehearsed narratives, and canned responses (Hathaway & Atkinson, 2003).

The findings of this study also suggest some practical reasons for using maps and provide some additional evidence for the view that maps may provide a means to "...prompt research participants and unlock unique memories of past participant experiences" (Legard et al., 2003, p. 148). While the findings of this study suggest some promise in the use of mind maps to gather evidence, they are also limited. One issue, although not a significant concern for qualitative researchers, is that a more randomized research design might have offered a broader understanding of the role of maps. Ideally, the non-map group would have been randomly selected from the 19 participants, not from the 9 who may have been less inclined to participate. It may be that the non-map group was composed of participants too busy or disinterested to fully participate, and thus it may be this disposition that resulted in the lower number of identified concepts in the interviews and not their non-completion of a mind map.

Another limitation is related to how I defined detail and depth. In designing future projects, researchers might consider these notions from the outset and provide a more considered and academically based definition and qualitative justification for their inclusion. Indeed, if a study of this kind is reproduced another consideration should be the time between the creation of the maps and the interviews. In this study, I collected data through different stages; another approach would have gathered this evidence all at once. In hindsight, while I believe starting the data collection process early ensured I got as many responses from participants as possible, the time in between maps and interviews may have influenced the recollections by different participants. Other limitations exist as well. One emerged from the experience of some of the participants in completing the mind maps. Some suggested they had used mind maps before in social rehabilitation and policing. For others, though, the experience was more difficult. Three participants within the map group suggested that while it was a "good idea," it was "hard at first," and some struggled to complete it. For these participants visualizing the experiences and organizing their thoughts took some time.

A final limitation relates to my role on the project. As Project Manager for the LLRP, I wrote the proposal, negotiated the contract and managed all aspects of project delivery. As a result, I had a number of concerns. The first was that some participants, based on their relationship with me, might choose to share only more positive retrospections. To address this potential, questions were included which were designed to provoke more critical reflections. In addition, I was concerned that my experiences developing and delivering the project might influence my findings. There may be no way to adequately address critiques of this nature. One attempt I made was to use the mind map methodology, which was proposed and tested through this project. Using maps to generate unsolicited reflections, unprompted by a literature review or leading questions may have successfully assisted me to mitigate the possibility that my own personal experience biased the findings. It may not convince everyone.

## Conclusions

Mind maps, while a nascent qualitative data collection tool, appear to be an attractive means of data collection. By specifically focusing on user-generated

representations of experience, mind maps allow individuals a unique role in research. By allowing researchers to rely less upon traditionally framed interview questions and more on the individually constructed realities of participants, maps can be used to probe the *backstage* of participants' experiences and perceptions (Legard et al., 2003). While beyond the purview of this paper, mind maps may also provide a useful new tool as part of emergent mixed method research designs (Johnson & Onwuegbuzie, 2004; Wheeldon, 2010).

This limited study suggests that mind maps as part of a multi-stage research design can provide participants an opportunity to create user-generated and individual graphic representations of experience. When combined with follow up interviews, and rudimentary techniques such as concept counting, this kind of approach may allow for individual concepts to reappear in multiple stages of data collection. In this study, the completion of mind maps led to an increase in concepts identified by participants in subsequent data collection and resulted in an increased willingness among participants to provide summative and reflective responses based on their own unique experiences. In addition to the provision of greater detail, those who completed maps provided more in depth contributions through responses that were longer, suggested connections between different concepts, and provided more concrete examples of their experience.

While some participants found completing a map initially challenging, those who completed mind maps found the exercise to be useful in helping to recount, frame, organize, and represent their experience. Indeed, although more research is needed to assess the value, challenges, and limitations of using mind maps to gather qualitative data, there appears to be some evidence that maps offer a means for unsolicited interaction between researchers and participants. It may also be that in qualitative research, a picture is really worth a thousand words.

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