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Hughes, Hilary and Williamson, Kirsty and Lloyd, Annemaree (2007) *Critical incident technique.* In: Lipu, Suzanne, (ed) Exploring methods in information literacy research. Topics in Australasian Library and Information Studies, Number 28 . Centre for Infromation Studies, Charles Sturt University, Wagga Wagga, N.S.W., pp. 49-66.

Critical Incident Technique
Hilary Hughes
2007

Chapter 4: Exploring methods in information literacy research
S. Lipu, K. Willimason and A. Lloyd (Eds.)

Introduction

What are the key attributes of an effective IL educator?
What difficulties do students encounter in using online information resources?

These are the types of qualitative questions that Critical Incident Technique (CIT) is well suited to exploring. This chapter outlines the origins, ongoing development, implementation, advantages and disadvantages of Critical Incident Technique and its potential for information literacy research. I draw on my current research into international students' use of online information resources to demonstrate the application of CIT in an information literacy context.

Overview of critical incident technique (CIT)

Defining CIT

Critical incident technique (CIT) is a well proven qualitative research approach that offers a practical step-by-step approach to collecting and analysing information about human activities and their significance to the people involved. It is capable of yielding rich, contextualized data that reflect real-life experiences. Its creator John Flanagan described it as:

> A set of procedures for collecting direct observations of human behavior in such a way as to facilitate their potential usefulness in solving practical problems and developing broad psychological principles. The critical incident technique outlines procedures for collecting observed incidents having special significance and meeting systematically defined criteria (Flanagan 1954, p. 327).

The value and efficacy of CIT is attested by research studies in a widening range of social science disciplines over fifty years. As its name suggests, critical incident technique involves the study of *critical incidents* - or significant instances of a specific activity - as experienced or observed by the research participants. Detailed analysis of critical incidents enables researchers to identify similarities, differences and patterns and to seek insight into how and why people engage in the activity.

> People assign meanings to their experiences, and when we group together collections of such meanings in order to make sense of the world, we engage in a kind of research, a seeking of understanding. The critical incident technique provides a systematic means for gathering the significances others attach to events, analyzing the emerging patterns, and laying out tentative conclusions for the reader's consideration' (Kain, 2004, p.85).

CIT findings generally support practical outcomes – often related to education or training - and provide a knowledge-base for further research.

Origins and ongoing development of CIT

Critical Incident Technique (CIT) was developed in the nineteen forties by John Flanagan, an American researcher in the field of occupational psychology (Flanagan, 1954). Its original emphasis on human behaviour reflects the prevailing positivist research paradigm. Flanagan devised it as a means to gather and analyse objective, reliable information about specific activities. He intended that the findings would underpin practical problem solving in areas such as employee appraisal and performance enhancement.

The first CIT studies addressed military issues such as combat leadership, pilot disorientation and bombing raid failures and supported pilot selection and training. Since then it has been used in a range of social science disciplines, including psychology and counseling (Chell,1998 ; Woolsey,1986), management (Ellinger & Watkins,1998;) and education (Christie & Young,1995; Kain,1997; Redmann et al., 2000; Tripp,1993). Notably CIT has provided a sound methodological basis for library and information research, including:
- Library user studies (Andrews,1991; Radford,1996; Slater & Fisher,1969; Sullivan-Windle,1993)
- Library systems and information use (Tonta,1992; Wilkins & Leckie,1997; Wilson, Starr-Schneidkraut & Cooper, 1989)
- Library management and human resources (Fisher & Oulton,1999)

Flanagan regarded CIT as a 'flexible set of principles which must be modified and adapted to meet the specific situation at hand' (Flanagan, 1954, p. 335). Over the fifty years since its inception CIT has proved responsive to changing research approaches. Researchers have modified CIT in various ways, extending beyond 'scientific' behavioural analysis to more holistic investigation of aspects of human experience and meaning that people attach to activities. Researchers, including myself, are tending away from previous concerns about objectivity and generalization towards individual perspectives and significance (Chell,1998; Kain, 2004).

Defining 'critical incident'

In general usage 'critical incident' often implies a major crisis or turning point, such as the 9/11 terrorist attacks or the Boxing Day tsunami. Chance events may be catalysts for discovery and innovation. Real life incidents also provide the focus for CIT studies. While they are not necessarily dramatic, they still represent aspects of human experience that are significant to the individual concerned. Numerous incidents - instances of a particular activity - are purposefully collected in the course of a CIT research project.

According to Flanagan (1954, p. 338) 'an incident is critical if it makes a 'significant' contribution, either positively or negatively to the general aim of the activity' and it should be capable of being critiqued or analysed'.

CIT in practice

This section outlines the five-step CIT process established by Flanagan (1954). It also presents my doctoral study as an example of CIT modified and applied to information literacy research.

Background to the study

My study is entitled *International students using online information resources for learning*. It stemmed from my experiences as a librarian/IL educator in Australian tertiary institutions. From my professional practice and reading I am aware of the diversity of international students' personal, cultural and educational experiences and the associated challenges they often encounter whilst living and learning in Australia. However, empirical data about their information literacy needs is still quite limited.

This exploratory study involved 26 international students from two Australian universities. It sought insight into their experiences of using online information resources for study, as expressed through their actions, thoughts and feelings. My aim was to identify associated information literacy learning needs and so to support evidence-based development of IL strategies that respond to these needs.

Selecting CIT

I selected critical incident technique as research method for this study because:
• it supports a straightforward qualitative approach;
• it offers well proven, clearly defined guidelines for data collection and analysis;
• it focuses on real-life human experiences;
• it enables the development of practical outcomes;
• it is relatively flexible; and
• it has successfully supported other LIS and education studies.
However, in common with other researchers I have developed a modified approach to CIT. Since this study is based on a holistic understanding of information literacy and online information use (Bruce 1997; Hughes, 2006) I widened the CIT behavioural focus to integrate behavioural, cognitive and affective responses and cultural and linguistic influences. As Chell (1998, p.60) comments:

> The unit of analysis may be the individual, the group or the team, but the CIT allows for the focus to shift, for example to the organization, the industrial sector or the location – region or community, country or nation. Thus, for example, one may explore overarching concepts like 'climate', 'culture, 'style', etc. by examining the categorical data across the sample as a whole.

CIT five-step process

CIT offers a clearly defined, systematic and sequential research process. As envisaged by John Flanagan (1954) it consists of the five following steps:
1. Establish the general aims
2. Establish plans and specifications
3. Collect the data
4. Analyze the data
5. Interpret and report the data

In the following paragraphs I outline each of these steps as specified by Flanagan (1954). I also explain the ways in which I followed - and also adapted - these guidelines in my study.

Step 1: Establishing the general aim

The first essential CIT step is to define the *activity* to be studied and establish its *aim*. This supports the development of the research questions and provides direction for the data analysis and presentation of the findings. The aim is encapsulated in a brief, clear statement – a 'functional description' that indicates the objective of the activity and what someone engaging in the activity is expected to accomplish. Flanagan recommended that

researchers consult experts in the field to ensure that the aim is relevant and widely acceptable to other researchers and practitioners. In the information literacy context sources of expert opinion might include: academics; LIS colleagues or managers; organizations such as ANZIIL or ALIA; research and practitioner literature.

I determined that the activity at the heart of my study is *using online information resources for study.* Consequently, as experts in the field I identified eight academic librarians with extensive reference and information literacy experience and asked them: "What do you consider to be the aim of using online information resources?"
Their responses enabled me to compile the following collective aim:

> *The aim of using online information resources for study is to gather information, develop understanding, widen experience, overcome challenges, adopt critical perspectives, construct knowledge, create new meanings and achieve learning outcomes*

Step 2 - Establishing plans and specifications

This involves developing a detailed and defensible plan of attack for data collection. Importantly this includes the identification of *critical incidents* and the recording of *critical behaviors*. Flanagan suggested that these details should be carefully documented to ensure consistency and objectivity in data collection, especially in large-scale studies involving more than one researcher. The four key considerations in this process are described below, accompanied by a brief explanation of their application to my study (summarised in Table 4.1).

1. *situation* -The researcher specifies the location, conditions, research participants and the activity. In my study the situation was represented as:
   Where? – two Australian universities*; Who?* – 26 international students*; What?* - using online information resources for study.

2. *relevance - t*he researcher specifies both the types of *critical incidents* and the nature of *critical behaviors* that are relevant to the study and therefore worthy of being recorded. In my study *critical incidents* were represented as *recent assignments that involved the use of online information resources*. I rationalized this on the basis that assignments generally involve some active engagement with online resources. In addition they often have a significant impact on students' study experience and so are likely to be vividly remembered. In place of Flanagan's term *critical behaviors,* I used the more expansive term *critical interactions.* This recognises the complex nature of using online information resources that involves not only actions, but also a variety of inter-related critical and creative processes such as planning, managing and reflecting.
   I also introduced the notion of *dimensions* as an additional qualitative layer. These encompassed students' cognitive or affective responses to the use of online information resources for study, as well as cultural or linguistic influences on this use.

Table 4.1 – Example of plans and specifications -

Activity	Using online information resources for study purposes.
Aim of the activity	To gather information, develop understanding, widen experience, overcome challenges, adopt critical perspectives, construct knowledge, create new meanings and achieve learning outcomes.
The situation	Who? 26 international students in their first year of study in Australia; undergraduate or postgraduate. Where? 2 Australian universities. What? Using online information resources to complete assignments.
Critical incidents	Recent assignments that involved the use of online information resources.
Critical interactions	Any/all instances and actions involving the use of online information resources for study.
Dimensions	Any/all cognitive or affective responses to – or cultural or linguistic influences on - the use of online information resources for study.
Sole researcher	Ensured consistency in data collection. Professional experience afforded familiarity with the activity. No training or recruitment of additional researchers was required.

3. *extent* - the researcher specifies criteria for collecting critical incidents based on their significance, in terms of the extent of their positive or negative effect on the general aim. In my study I took a broad approach here, in considering that all aspects of the online information use experience (behavioural, cognitive and affective responses, cultural and linguistic influences) are potentially significant and capable of having a positive or negative effect.

4. *observers* - the researcher ensures that all data collectors are familiar with the activity being studied and receive thorough instructions and training in the data collection process. I considered that my professional experience as librarian/information literacy educator ensured my familiarity with the activity. As sole researcher, no further selection or training of observers/interviewers was necessary.

Step 3: Collecting the data

This step involves collecting critical incidents that relate to the activity being studied. Flanagan provided detailed instructions concerning the means of collection, required sample size and composition of the questions.

Preferred means for data collection are individual interviews or direct observations. Group interviews are acceptable where participant numbers are large. Written responses or questionnaires may also be used, although they might be less effective since they tend to lack the immediacy of observations and interviews. Flanagan stressed the importance of informing the interviewees about the purpose of the study, the basis for participant recruitment and preservation of their anonymity. To minimize ambiguity and bias he also recommended careful wording of questions and the use of pilot interviews.

To enable full and accurate responses participants are requested to focus on incidents that they have recently taken part in or observed first-hand. They may describe one or several incidents that represent positive and/or negative aspects of the activity being studied. They are also encouraged to provide factual reports, rather than interpretations, of what happened.

CIT seeks contextualized examples of the activity and its significance and questions typically follows a binary positive/negative pattern. For example:

- think of a time that a colleague presented an effective/ineffective IL session…
- describe the circumstances and nature of this incident
- explain why you consider this incident to be significant
- what did this person do that was effective/ineffective?
- why was it effective/ineffective?
- describe the outcome(s) or result of the incident

Flanagan stated that there are no firm rules about appropriate 'sample size' for CIT. The determining factors relate to the complexity of the activity and variety and quality of the critical incidents, rather than the number of participants. He also suggested that data collection and analysis should be carried out concurrently. Incidents should continue to be collected until redundancy occurs – that is, when no new *critical behaviors* appear. Thus the optimum number of critical incidents for a CIT study can range anywhere between 50-100 to several thousand.

Table 4.2 outlines the data collection strategy that I developed for this study. It varies from standard CIT in two ways. Firstly, the interviews were more expansive than many CIT studies. As explained previously, rather than focus purely on behavioural aspects they were based on a holistic understanding of online information use which integrates actions, thoughts, feelings and influences. Secondly, I adopted a dual approach to data collection by supplementing the usual semi-structured interviews with observations of students carrying out a practical task. While the interviews focused on how and why participants use online information resources, the observed set task examined how well they used them. The advantage of this dual approach is that it allowed me to draw on both the participants' personal accounts of their online information use and my more objective assessment of the effectiveness of their use. This allowed for 'triangulation' and provided alternative perspectives on the activity, thus enriching the picture of the students' online information use.

The interviews were semi-structured and conversational, with a view to encouraging the students to speak freely about their experiences. I used a set of open questions as an interview guide, but did not always address them in sequence. I also used casual prompts to help elicit or clarify information. In the initial stages of the interview, to develop confidence and provide context, the students were invited to talk about their personal, educational, cultural and linguistic experiences and their previous library and information use. Next I requested them to focus their attention on a critical incident - a recent assignment that required the use of online information resources. My subsequent questions related to this experience. They had a characteristic CIT flavour and a positive/negative structure, for example:
What resources did you use / not use for this assignment? Why?

The practical task represented another critical incident and sought examples of effective/ineffective uses of online information resources. I observed students using three online tools (the library catalogue, a journal database and an internet search engine) to select online information resources on the topic:
*Compile an annotated bibliography on effective public speaking techniques in busines*s.

The participant group of 26 international students was relatively small for a CIT study and it produced only 48 *critical incidents* - one from each interview and set task. However, the expansive nature of the interviews and set task yielded over one thousand *critical interactions (*which correspond with Flanagan's *critical behaviors)*. It is unrealistic to claim that I reached a point of redundancy in data collection given the complexity of the activity. However, the analysis process, which is described in the following section, reveals significant patterns and variations in the students' experiences.

Table 4.2 Example of data collection

Participants (reflected the culturally and linguistically diverse student populations)	26 international students enrolled at CQU Brisbane International Campus & QUT. 10 undergraduates & 16 postgraduates Studying a range of disciplines, mainly, Business & IT. 15 different countries of origin: Japan, Malaysia, Taiwan, China, Singapore, Indonesia, Thailand, Vietnam, India, Israel, Jordan, Mexico, Poland, Sweden, England.
Data collection activities	Semi-structured interviews. Observed set task involving the use of 3 online information tools (library catalogue, journal database & internet search engine).
Interview (focused on *use* of information resources)	Initial conversation about the student's personal, cultural, linguistic, educational experiences & previous library and online information use. *What online information tools and resources did you use / not use for this assignment? Why?* *How did you use them?* *What did you find hard /easy about using these online resources and tools? Why?* *What makes it hard / easy for international students to use online resources? Why?* *What could be done to make online information use easier for international students? Why?* *Overall was using online information resources for this assignment a positive experience / not a positive experience? Why?*
Observed set task (focused on *effectiveness* of students' use of online information resources).	Participants were requested to: *Imagine that you have been set an assignment with the topic ' Compile an annotated bibliography on effective public speaking techniques in business' …* *Please show how you would search for and select information on this topic using the library catalogue, a journal database and an internet search engine.*

Step 4 - Analysing the data

This step involves an inductive data analysis process that aims to classify *critical incidents* and identify *critical behaviors*. These are arranged into a series of well defined, mutually exclusive categories and sub-categories of decreasing generalisability/increasing specificity. The analysis process recommended by Flanagan is outlined below, followed by a description of its practical application to my study.

Frame of reference. The researcher develops a *frame of reference* – a set of broad categories for classifying the critical incidents. These main categories and their headings should reflect the aim of the activity and relate to the intended application of the data.

Category formulation. The researcher sifts the critical incidents, identifies critical behaviors and sorts them into categories and sub-categories. This might entail a trial and error approach since the categories are not pre-determined; rather the researcher allows them to emerge (or suggest themselves) during the process. Flanagan (1954, p. 344) considered this to be the most challenging analysis aspect, since it depends on the 'insight, experience and judgment' of the researcher. The following guidelines for constructing categories and creating the classification structure are adapted from Flanagan.

To construct the categories:
• Sort a relatively small sample of critical incidents into broad (main) categories
• Create tentative names and brief definitions for the main categories

- Sort the remaining incidents into the main categories - create additional main categories and definitions, or modify existing ones, as necessary
- Divide main categories into sub-categories as finer similarities and differences become apparent
- Continuously re-examine the main categories and sub-categories - revise categories and reallocate critical incidents, as necessary
- Continue this process until all critical incidents have been appropriately classified

Aim for:
- A clear-cut and logical organization
- Meaningful headings for sub-categories, without need for accompanying definitions
- Neutral headings - expressed in active terms
- Comprehensive coverage of all critical incidents

Specificity. The researcher determines the appropriate level of analysis, according to the aim of the activity and intended use of the data. This involves balancing the relative merits of specificity against generality. The former affords greater complexity and detail, while the latter results in a simpler, broader overview.

Trial, error, persistence, logic and intuition all contributed to my data analysis approach. This involved continuous examination – and re-examination - of interview transcripts and observation records to ensure salient, consistent coverage of the participants' online information use experiences.

Note: Seeking to retain a close connection between the participants' comments within the context of the whole interview I worked mainly with the transcripts using colour-coding and margin notes to identify categories and I used spreadsheets to organize the categories. Alternative approaches to CIT data analysis include manually sorting critical incidents on index cards and using a data analysis program such as *QSR NVivo*.

CIT underpinned the analysis process, although my analytical approach extended beyond purely behavioural concerns in also addressing cognitive and affective responses, cultural and linguistic influences. As explained in Step 2, the key data elements - *critical interactions* – were a more expansive version of Flanagan's *critical behaviors.* The *dimensions* were my addition.

Working inductively with the data I identified categories and developed the *categorization framework* that is outlined in Table 3 below. In line with CIT specifications this related directly to the aim of the activity - *using online information resources for study -* and its intended application to information literacy. The *categorization framework* comprised four levels of categories of differing types. Level 1 and 2 categories could stand alone, while Level 3 and 4 categories needed to be attached to individual Level 2 categories.

- *level 1 online sources -* these were the six main categories. They corresponded to the different types of online tools and resources that participants interacted with (or used) for their assignments, namely: *Online sources (general), Online catalogue, Online journal databases, Internet search engines, University/Library online sources, Specialist online sources.*
- *level 2 critical interactions - these* sub-categories were the most numerous and varied. They comprised the *Critical interactions* and so represented the many ways in which participants interacted with particular online sources, for example: *developing a search strategy; searching a journal database; evaluating a web resource.*
- *level 3 CIT descriptors:* These sub-categories described the nature of particular *interactions.* One or more of these descriptors could be attached to an interaction. They were grouped in four pairs and so reflected the standard CIT binary pattern, as follows:

- U / NU (Used / Not Used) – instances of a student's interaction or non-interaction with a particular online source
- E / IE (Effective / Ineffective) – instances of a student's effective or ineffective interaction
- EA / H (Easy / Hard) – instances of a student experiencing ease or difficulty in their interaction with a particular online source
- P / N (Positive / Negative) – instances of a student reporting positive or negative responses to their interaction

• *level 4 Dimensions* - these sub-categories represented qualitative *dimensions* that overlaoverlaid *interactions.* They related to:

• Cognitive and affective responses - the students' reactions - their thoughts and feelings <u>about</u> using online information resources)

• Cultural and linguistic influences on their interactions. Dimensions were further subdivided into *aspects* (Level 4a). One or more of these dimensions could be attached to a particular interaction.

Table 4.3 below offers a snapshot of my *categorization framework* and some sample categories.

Table 4.3 Example of categorization framework and sample categories

Level 1 **Online sources**	Using online sources (general) Using online catalogue Using online journal databases Using internet search engines Using specialist online sources – ABS, AUSTLII etc Using university/library online sources – course readings, IL tutorials, eprints
Level 2 **Critical interactions**	Selecting catalogue, journal database, Google etc Searching catalogue/database/Google etc Evaluating results Selecting resources Processing results – printing, saving, bookmarking etc Synthesising information Etc …
Level 3 **CIT descriptors**	U / NU (Used / Not used) E / IN (Effective / Ineffective) EA / H (Easy / Hard) P / NP (Positive / Not positive)
Level 4 **Dimensions**	CR -Cognitive responses AR - Affective responses CI - Cultural influences LI - Linguistic influences
Level 4a **Dimensions - Aspects**	Cognitive responses – critical comments, suggestions Affective responses - exciting, pleasing, frustrating, boring etc Cultural influences – literary, historical, political allusions, humour etc Linguistic influences – vocabulary, jargon, academic style etc

Table 4.4 demonstrates the categorization process applied to an interview excerpt. This brief statement is rich in information about the student's use of the online catalogue and reveals some language-related difficulty but also positive development.

Note: It is all too easy to loose sight of the fact that categorisation is a means rather than an end in itself. Its purpose is to allow the manipulation and grouping of data in different ways, enabling researchers to identify the similarities, differences, relationships and patterns and so leading to new understandings and practical outcomes.

Table 4.4 Example of categorisation process

Interview excerpt:
I searched the online catalogue. It was helpful. For international students it's basically easy – easier for Australian students because they know the right words. At first it was hard for me – now I've got used to it.

	Level 1 Online sources	Level 2 Critical interactions	Level 3 CIT descriptors	Level 4 Dimensions
I searched the online catalogue.	Using online catalogue	Searching catalogue	U	
It was helpful.			P	
For international students it's basically easy – easier for Australian students because they know the right words.			EA	LI- vocabulary
At first it was hard for me – now I've got used to it.			H - EA	

Step 5 - Interpreting and reporting

This step involves interpreting and reporting the data, in line with the intended application of the findings. CIT does not require a specific report format, but the results often include a set of *critical behaviors* that define the activity studied. In order to establish the credibility of the findings Flanagan emphasized a need to carefully explain and justify how the four preceding steps had been carried out and to specify precisely the circumstances in which the findings could be said to apply.

The findings of the study were presented as thematic narrative, recommendations, tabulations and graphics. The separate parts highlight various inter-related aspects of international students' online information use. In combination they create a practical and conceptual knowledge-base with potential to inform, support and promote information literacy development., In accordance with CIT principles, the findings of this study offer a research-based approach to developing students' information literacy learning and practical problem-solving.

Ethical and intercultural considerations

CIT requires close attention to ethical practices, since it involves interaction with human participants who entrust researchers with information about their personal and professional lives. Consequently as researchers we have a responsibility to: preserve the participants' confidentiality and respect their dignity; take care to explain the purpose of the study, the exact nature of the participants' involvement and the ways in which their responses will be handled; assure them that their participation is voluntary; avoid any kind of coercion and allow participants to discontinue their involvement at any time; heed any signs of distress, anxiety or embarrassment. In addition, the diverse nature of our society calls for a high degree of social, cultural, linguistic sensitivity. While this is not unique to CIT, it was an important consideration in the design and implementation of my study involving international students.

Advantages, disadvantages and IL applications of CIT

In conclusion I summarise the key advantages and disadvantages of CIT and its usefulness for information literacy research, as noted by myself and other researchers.

Advantages

CIT lends itself to exploratory research that seeks context-rich, first-hand perspectives on human activities and their significance. The focus on recalled and observed incidents brings an immediacy and authenticity (Ellinger & Watkins,1998). This insight into real-life individual experiences assists the identification of broader patterns and understandings (Chell,1998), whereby the study of unique experiences can illuminate 'shared reality' (Kain, 2004, p. 82). CIT also might enable the identification of key research issues, develop a knowledge-base for further investigation and support conceptual modelling (Woolsey,1986).

CIT interviews allow 'linkage between context, strategy and outcomes' (Chell,1998, p.68). Critical incidents provide a powerful research focus. They help define the aims and boundaries of the study and ground it in reality. In interviews they provide direction and can prompt participant recall. Data analysis procedures are structured, yet flexibly allow both fine-grained and more general approaches depending on the intended application of research findings. Whilst CIT is considered to be a qualitative method it admits some statistical description. Where required it enables relatively high levels of objectivity, for as Flanagan (1954, p.355) observed: 'Rather than collecting opinions, hunches and estimates (CIT) obtains a record of specific behaviors'

From the practitioner's perspective CIT is practical and relatively straightforward to implement. According to Christie & Young (1995, p.7) CIT is 'grounded…in common sense procedures'. The technique can be applied to research projects of varying sizes and locations and can be implemented on an individual or team basis. It is capable of collecting and analysing large amounts of interview and observation data. Extensive theoretical knowledge and statistical expertise are not essential, although CIT does call for a well developed critical sense and attention to detail.

Although CIT procedures are quite precise, they are proving amenable to modification, especially with regard to data collection approaches (Ellinger & Watkins,1998; Shirey, n.d; Woolsey,1986). In particular, as evidenced by my approach, CIT perspectives are tending to widen from purely behavioural concerns to more holistic conceptions of human experience that encompass 'the conscious reflections of the incumbent, their frame of reference, feelings, attitudes and perspective on matters which are of critical importance to them' (Chell, 1998, p. 68). Moreover, some researchers are finding useful compatibilities between CIT and other research methods such as case study or grounded theory (Chell,1998).

Disadvantages
On a conceptual level, CIT lacks the strong theoretical underpinnng of some other qualitative methods such as phenomenography or participatory action research. However, this can be advantageous for studies that aim to develop a conceptual frame or follow a 'grounded' approach. Also I have found CIT's behavioural emphasis somewhat constrictive since binary descriptions (effective/not effective, successful/not successful) are not always adequate for dealing with the nuances and gradations of human experience. Again, this may be compensated by CIT's modifiability.

On the practical level, the categorisation process for CIT data analysis is painstaking and time consuming. CIT's reliability as a method is sometimes challenged with regard to: limited

generalisability of the findings; subjectivity of analysis; selectivity or lack of accuracy of critical incident data, due to its personal recalled nature (Chell,1998; Kain, 2004). In common with other qualitative research approaches these aspects can be mediated by close attention to context-specific analysis and description in terms of 'a careful explanation of the process followed and attention to rich descriptive detail, providing the reader with a basis to judge the applicability of the research' (Kain, 2004, p.78).

Information literacy applications

CIT offers a promising approach for some types of information literacy research. As mentioned previously, CIT already has a proven track record in the education and LIS fields. For example, Fisher and Oulton (1999, p.124) comment:

> We would argue that the technique has much potential value for researchers in library and information management in, for example, studies of the professional-client interface; understanding organisational cultures and management styles; and, of course, identifying real training needs.

The *Encyclopedia of library and information science* notes that CIT 'can provide information that is objective as well as valid and is a tool of great potential for the researcher interested in the human element of the information problem' (Shirey, n.d, p. 291).

CIT is particularly useful where evidence-based performance appraisal and development are required. Thus in an information literacy context CIT might be used for example to evaluate: teaching strategies; learners' IL capabilities; or online information services. The results of such research might then be applied to enhancing: professional development; IL curriculum planning and implementation; learner-responsive information services; ICT interfaces. Significantly also the potential of critical incidents as stimuli for learning and reflection has been recognised (Chell,1998; Tripp,1998) and might be worth pursuing in IL education.

Conclusion

Critical incident technique is a robust research method that has proved effective in numerous studies in a wide range of social science disciplines, including library and information science. Its well defined set of principles and procedures ensure that it is a relatively simple method to master and apply. CIT is best suited to exploratory research that seeks understanding of specific human activities or an information base for further research. In the context of information literacy CIT has potential for research that aims to support practical problem solving, performance enhancement and learning.

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