INFORMATION UTILISATION: A COGNITIVE ANALYSIS OF HOW GIRLS UTILISE DRUG INFORMATION BASED ON BROOKES' FUNDAMENTAL EQUATION $K[S] + \Delta I = K[S + \Delta S]$

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CERTIFICATE

I certify that this thesis has not already been submitted for any degree and is not being submitted as part of candidature for any other degree.

I also certify that the thesis has been written by me and that any help that I have received in preparing this thesis, and all sources used, have been acknowledged in this thesis.

Signature of Candidate

Production Note:
Signature removed prior to publication.

DEDICATION

This dissertation is dedicated to my late parents Margaret and Cedric Todd.

They provided me with opportunities for learning and living they never had, and in these opportunities they found their own dreams and hopes.

When I said: *"a little knowledge is a dangerous thing"*,
they said: *"where is the person who has so much as to be out of danger?"*

(T. Huxley. On elemental instruction in physiology. 1877)

Through their world, their wisdom, and their work,
I have found a never-ending beginning, and I thank them for it.

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ABSTRACT

The central focus of this study is cognitive information utilisation. Research in information utilisation to date has largely focused on the organisational outcomes of the take up of scientific and professional information in the context of social practice, and the related political, cultural and economic factors affecting this. Conceptualising information utilisation as a type of organisational change or end-state has tended to mask the complex cognitive exchanges that occur. While there has been increasing acknowledgement that information utilisation is a more holistic interactive change process involving cognitive strategies and transformations, very little research has focused on the cognitive dimension of information utilisation.

Bertram Brookes claimed that the theoretical pursuit of information science should be the cognitive interaction between people and information. He explicated this as the Fundamental Equation of information science, most commonly expressed in his writings as $K(S) + \Delta I = K[S + \Delta S]$. By this equation, Brookes was stating that in the process of doing something with information, a person's existing knowledge structure K[S] is changed by an increment of information ΔI, and this modification has some effect, a changed knowledge structure $K[S + \Delta S]$ where ΔS indicates the effect of the modification. This equation is posited as an expression of cognitive information utilisation.

The specific purpose of this study is to further understanding of cognitive information utilisation, employing Brookes' Fundamental Equation as a general framework for establishing research questions, operationalisations and procedures. With a group of four girls in their final year of secondary education, the study sought to: (a) establish the effects ΔS of exposure to information perceived by the girls; (b) establish how the perceived effects are associated with changes to their knowledge structures K[S]; and (c)

establish the patterns, if any, within and between the girls in relation to changes in knowledge structures and perceived effects (K[S + ΔS]).

The study employed a quasi-experimental repeated phase approach. The girls' existing knowledge structures about the drug heroin were mapped, and knowledge structures after each of three exposures to different information on heroin were also mapped. Eliciting the girls' knowledge about heroin was based on written discourse and question / answer protocols, and this knowledge was represented as conceptual graph structures, based on an analytical procedure developed by Graesser & Clark (1985). The data were analysed qualitatively to establish indicators and conceptualisations of the perceived effects, and to identify and conceptualise the changed knowledge structures.

The study found that the exposures to information and the deliberate consideration of this information had effects for all the girls. Five types of effects were perceived, these being: *get a complete picture, get a changed picture, get a clearer picture, get a verified picture, and get a position in a picture.* These effects are presented as types of cognitive information utilisation. The knowledge structures after each exposure were shown to change by cognitive strategies of appending, inserting and deleting. The analysis of the knowledge structures associated with these five effects showed that there was coherence between the effects and how these effects were manifested in changes to the girls' knowledge structures. A number of distinct patterns were evident, for example, *get a complete picture* was associated with revised knowledge structures that were more inclusive, elaborative and integrative.

The study raises important implications for information practice, including data base design, information interviews, provision of information in media campaigns, and instructional design. The study also addresses methodological issues and identifies area for further research.