

Alanah Kazlauskas

Being expert in the 21st century

School of Business and Informatics (NSW), ACU National, Sydney, Australia;

Introduction

With a history that extends back more than 2000 years, doping in sport presents society with one of the many ‘wicked’, global problems that 21st century experts from various disciplines are attempting to solve. This paper reports the outcomes of research which throws light on ‘being expert’ in the 21st century through its investigation into the dynamics of the work of the scientific directors of accredited anti-doping laboratories. These experts in the scientific detection of banned substances by athletes, labour to solve the ongoing problem of doping in sport. The research drew on the literature of complexity theory, communities of practice, and activity theory to gain insights into evolution of anti-doping efforts and the work of these experts. Data was collected through interviews, surveys, and from public documentation and observation. To enable the co-construction of the study’s findings, and to stimulate further data gathering, individual participants and the scientific anti-doping community were asked regularly to comment of the study’s findings at various stages throughout the work. This ‘mirroring’ provided a mechanism to ensure that the researcher’s understanding of the participants’ data was correct, to build trust between the community and the researcher, and to address any concerns in the community about researcher bias.

The paper begins by examining the history of anti-doping work through the lens of the complexity based *Cynefin* framework as a way to challenge current ways of thinking about both the context, and those who work within it. The following section examines the perceptions of the directors and their stakeholders about the nature of the directors’ work and presents a model for the dynamics of such expert work. Finally, the paper examines and provides a timely reflection on the role of the annual Manfred Dönike Workshop on Doping Analyses within the community of anti-doping scientists. In each section, the paper poses questions for the community and the researcher.

The complexity of anti-doping work

Doping in sport presents a complex, global, social problem. About such problems, Rittel and Webber (1973) warned:

The search for scientific bases for confronting problems of social policy is bound to fail, because of the nature of these problems. They are "wicked" problems, ... Policy problems cannot be definitively described. Moreover, in a pluralistic society there is nothing like the undisputable public good; ... policies that respond to social problems cannot be meaningfully correct or false; and it makes no sense to talk about "optimal solutions" to social problems unless severe qualifications are imposed first. Even worse, there are no "solutions" in the sense of definitive and objective answers. (p. 155)

Since the first attempts to regulate against doping in sport during the 1920's and 1930's, anti-doping work has undergone considerable transformation. The nature of this change can be better understood through the lens of complexity based *Cynefin* framework, which supports sense-making in dynamic contexts. Snowden writes that the *Cynefin* framework:

links a community into its shared history – or histories – in a way that paradoxically both limits the perception of that community while enabling an instinctive and intuitive ability to adapt to conditions of profound uncertainty. ... Critically it emphasizes that we never start from a zero base when we design a knowledge system, all players in that system come with the baggage, positive and negative derived from multiple histories. (Snowden, 2002, p. 104)

Snowden acknowledges the natural and open presence of diversity, ambiguity and paradox within human communities. These elements are incorporated into the four corners of the *Cynefin* framework by domains as the various combinations of visible / invisible and order / *un*-order. The visible, *un*-ordered domain is chaotic: Everyone can see that no one knows what's happening. This domain is where unsolved problems are noticed. The visible, ordered domain is where solutions are known: Organisations have sound solution-giving strategies in place. The two invisible domains are inhabited by experts who work to transform *un*-order into order. In the complex, invisible, *un*-ordered domain, experts begin to see if they can solve a chaotic problem by attempting to define the problem in terms of their own expertise and then hypothesise solutions. The ordered testing of such solutions enables the identification of patterns and subsequently results in the identification and complicated development of reliable, validated solutions to the problems ready for use by organisational bureaucracies. Problems are originally recognised when they are chaotic situations in the visible *un*-ordered domain. They can be solved by the organised imposition of visible order in the form of standardised procedures, or by letting experts to tackle the problem, build an understanding of

the problem's complexity and develop robust, validated solutions which can then be handed over to organisations to implement. The constant tension between the forces of the past towards stabilisation and order, and the forces of the future towards un-order and chaos through obsolescence, forgetfulness, curiosity and energy, is an inherent characteristic of natural systems. This framework has been represented diagrammatically in Figure 1.

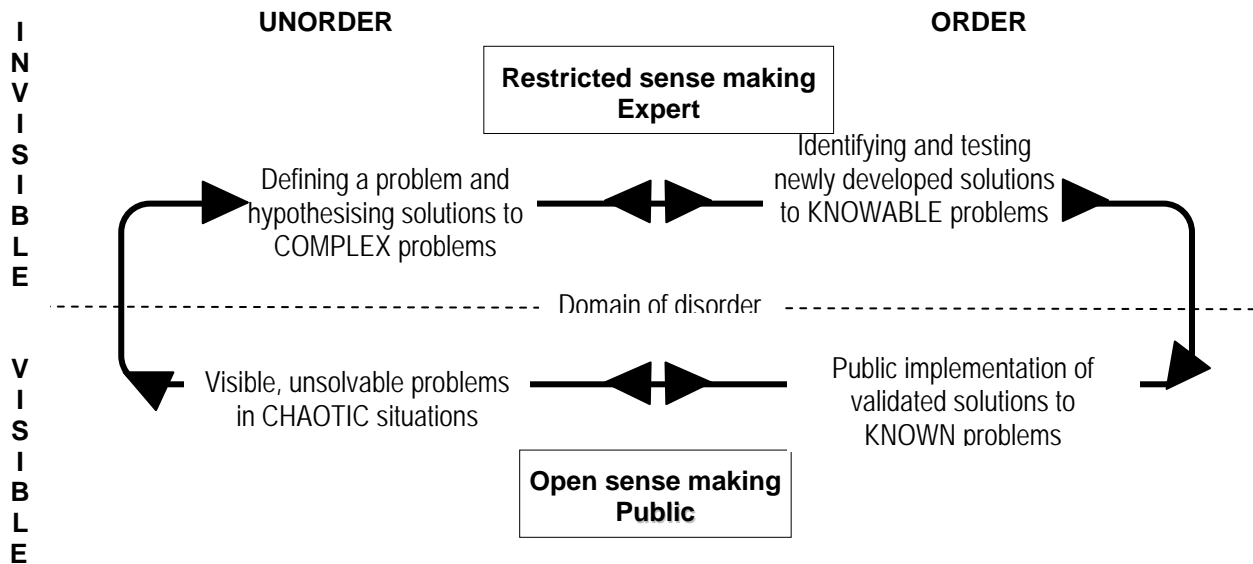


Figure 1: The *Cynefin* complexity based, sense-making framework

At the centre of these four domains is a fifth domain, the domain of disorder, where individuals from the various domains “compete to interpret the central space on the basis of their preference for action” (Kurtz & Snowden, 2003, p. 470). Kurtz and Snowden believe that effective decision-making for sense-making requires the resolution of conflicts resulting from these different perspectives. This depends on the ability of stakeholders to agree upon the nature of a situation and the most appropriate response to that situation.

Examination of the history of anti-doping work through the lens of the *Cynefin* framework yield insights into the evolving nature of this field. Four strategies have evolved to address the evolving, multi-faceted problem of doping in sport:

- Strategy A: The introduction of rules: ‘Don’t do it!’
- Strategy B: The development of scientific methods to detect doping:
‘The accredited laboratories will tell us if you do it!’
- Strategy C: The development of national and sport-based testing programs
‘We educate, test and sanction our athletes.’
- Strategy D: The international harmonisation of anti-doping work
‘We have harmonized doping control in sport!’

The imposition of rules in the 1920s and 1930s by some sporting federations and by some countries in the 1960s in Strategy A represented the first effort to address the visible, chaotic situation of doping in sport. Regarded as a medically dangerous activity counter to the spirit of sport, some governments and sporting officials saw it as “evident that restrictions regarding drug use in sports were necessary” (WADA, n.d., par.2). The ineffectiveness of this strategy was apparent from the continued use of performance enhancing drugs by athletes. The definition of the problem in scientific terms saw the development of reliable analytical methods to detect doping by athletes and the willingness of a small group of scientists to work in this area led to the use of scientific expertise as the second strategy to deal with doping in sport. The evolution of an international network of scientific laboratories accredited by the IOC to do doping control analyses became Strategy B. However, whilst some doping was being detected, the low numbers of athletes regularly tested for doping meant that, publicly, doping in sport was still out-of-control. The subsequent definition of the problem in terms of organised testing and education programs led to the development of organised programs by some sports and some governments as Strategy C. Because of differences between, or lack of, strategies adopted by various governments and sporting bodies, doping in sport continued to be regarded publicly as a chaotic situation. In the late 1990s the problem was defined as one that needed international cooperation. Subsequently, additional expertise was directed towards setting up and implementing an internationally harmonised strategy, Strategy D, to deal with doping in sport. These strategies have been represented diagrammatically in Figure 2.

This examination of the history of anti-doping work indicates that anti-doping work relies upon different types of expertise and suggests a number of issues for the anti-doping community to reflect upon. The complexity of the situation has now been addressed by locally and internationally in various ways: rules, organised education and testing programmes and through the development and application of robust, validated scientific techniques. So, has the problem been solved? Recent events in the 2007 Tour de France suggest not. Are the forces of the future pushing the problem back towards chaos? If so what is the nature of these forces and what additional strategies will be developed by whom to deal with such forces adding other levels to Figure 2. How do anti-doping scientists and other anti-doping workers address the complexity of anti-doping work, the domain of disorder at its centre, and the balance of power between the various groups of anti-doping workers?

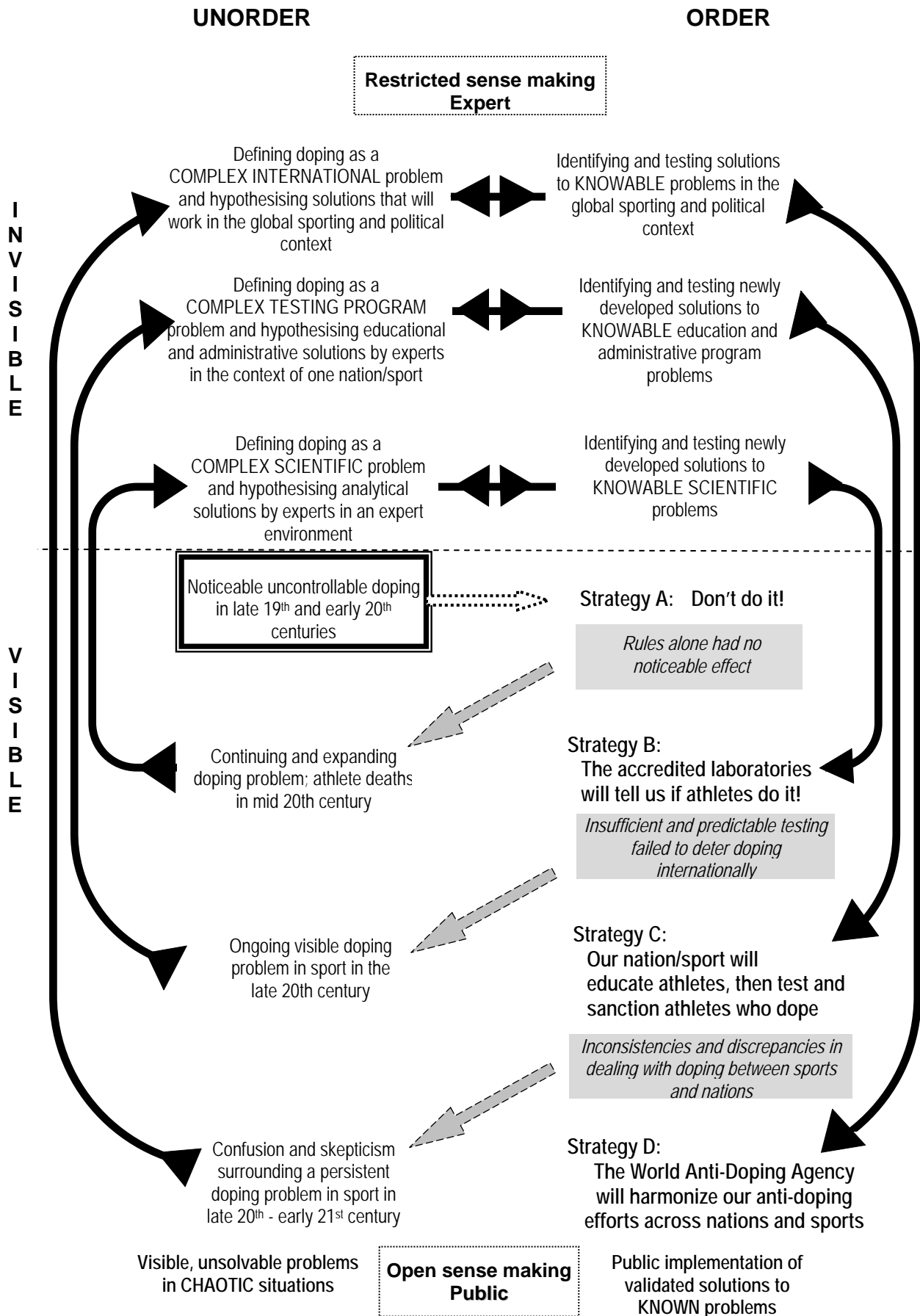


Figure 2: A Cynefin informed perspective on anti-doping work

How can anti-doping workers better understand and negotiate the domain of disorder at the centre of their work and so ensure that decisions maximise the effectiveness of their work? These and other questions are yet to be answered.

A model for the dynamics of expert work

Analysis of interviews with a number of directors and stakeholders indicated that from the beginnings of active efforts to control doping in sport, the role of the directors had been foundational. One stakeholder had commented that “*the whole thing would be nothing without them.*” The directors and laboratories had provided “*the ‘big stick’ on which anti-doping programs [relied]*” and a framework for anti-doping work. In spite of limited financial support, the directors remained passionate about and committed to their work. They found their work personally and intellectually satisfying. They were challenged by the need to develop robust, reliable analytical methods that could be implemented routinely by all doping control laboratories. Their work was demanding because of accreditation requirements and the scrutiny to which their work was subjected. Stress often resulted from a lack of resources for routine and research activities and their lack of involvement in governance activities. The Cologne Workshop played a critical role in their professional formation as anti-doping scientists and in the development and maintenance of individual and communal expertise.

Stakeholders stated that the directors had provided leadership and initiated knowledge sharing practices. In the past, the directors had shared their experiences and understanding of the issues and so educated and supported other professionals who were establishing their own roles in anti-doping policy, program and education work. In the future, stakeholders expected directors to be highly qualified scientists, capable managers or multi-disciplinary WADA / ISO accredited forensic laboratories able to enhance anti-doping science through multi-disciplinary research, and participators in anti-doping governance activities. Directors were also expected to be effective communicators and collaborators with their staff and with all stakeholders about routine, scientific and governance aspects of anti-doping work.

Analysis of routine sample numbers and research publications and presentations suggested that a director’s ability to fill all these roles was related to the volume of routine analyses conducted by the director’s laboratory. The ability to carry out regular anti-doping research was based on analysing at least 2500 samples annually and participation in governance activities required the considerably highly level of experience resulting from 4500 samples

annually. Other comments by the directors and observations of the 2003-2005 Cologne Workshops on Doping Analyses indicated that this annual event provided a trusted, private space critical for the directors' identity formation and for developing and maintaining expertise. Consequently, participation in the workshop was an important aspect of a director's work. Figure 3 presents a model for the directors' work based on these insights.

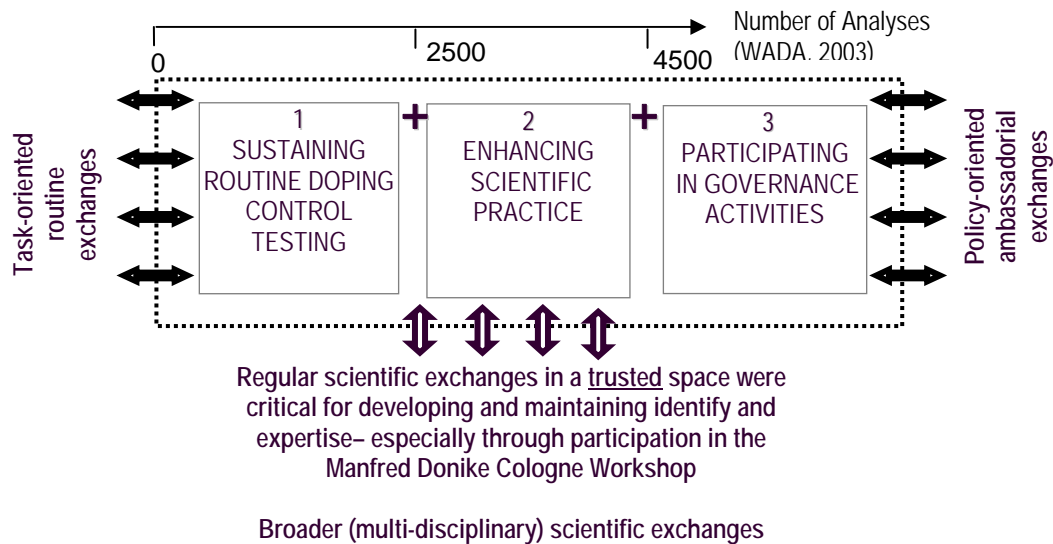


Figure 3: A model for the work of the scientific directors

This model also raises questions for the anti-doping community and the researcher. Does WADA's current International Standard for Laboratories ensure adequate support for those who take on the director's role by ensuring that accredited laboratories are resourced adequately? What other factors influence the ability of a director and his/her laboratory to do research? How have recent changes to the ISL impacted on the work of the directors? Is this model of expert work applicable to other contexts?

The role of the Cologne Workshop

The annual efforts of the Manfred Dönike Society have resulted in a comfortable, consistent event where workshop participants learn what it means to do anti-doping science and be anti-doping scientists; maintain expertise through sharing problems and their solutions - scientific and otherwise - by transforming complex problems into complicated but solvable ones; explore new knowledge contributions from their own and other fields, and share experiences and knowledge to enable informed engagement in governance activities. Not surprisingly, the

unique contribution of this event to anti-doping science is recognised and valued highly by both anti-doping scientists themselves and its few external stakeholder attendees.

The Cologne Workshop plays a critical role in knowledge mobilisation in this scientific community. Each year, anti-doping scientists carry out research to create the new knowledge needed to solve problems of their field. In Cologne, they present and discuss their work with their colleagues. Later they consider their original findings in the light of their discussion and the research done by their colleagues and do more research. The following year a slightly different group of scientists presents and discusses their recent research findings. These findings may have been revised and/or extended as a result of the previous year’s discussions. These too are discussed and reviewed by the community and taken away for further work by the participants. Engeström (2000) calls this recognisably multi-voiced, longitudinal cyclic process ‘knotworking’.

Further evidence of the knotworking process is contained in the proceedings of past Cologne Workshops and in the presentations made at recent workshops. Table 1 shows data about the longitudinal nature of knowledge dissemination by displaying the number of papers in the proceedings from the 1992 – 2004 Cologne Workshops relating to organisation of doping control testing for major events and research into the detection of peptide hormones. Table 2 shows the multi-voiced nature of such new knowledge by presenting data about the authors of presentations made about these same areas at the 2002, 2003 and 2004 Workshops.

Table 1: Longitudinal nature of knowledge dissemination at the Cologne Workshop

Theme	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	Total
Organisation of doping control	4	2	4	2	2	0	0	1	2	3	3	7	4	34
Peptide hormones	0	1	3	1	2	3	2	4	0	2	7	3	8	36

Table 2 : Multi-voiced nature of knowledge dissemination at the Cologne Workshop

	Year	Cologne Lab	Other Accredited Lab	Joint Accredited Lab research	Accredited and External Lab(s) research project	Non -accredited lab	External lab	Total presentations
Organization of doping control	2002	0	1	2				3
	2003	0	4	1	1		1	7
	2004	0	2		1		1	4
Peptide hormones	2002	1	2		4			7
	2003	1			2			3
	2004	0	2	1	5			8

Further examination of work on peptide hormones from an activity theory perspective makes visible the knotworking and co-configuration work in this area of anti-doping science. Figure 4 illustrates the longitudinal, multi-voiced nature of presentations relating to erythropoietin (EPO) at the 2003 -2005 workshops. Knotworking enables anti-doping scientists to co-configure new knowledge for their field. Such work is both personally and professionally demanding. Its allowance for partial solutions, mistakes, slow progress and respect for intellectual property rights associated with unpublished findings, means that it is best carried out in a trusted, private, shared space such as that created by the yearly Cologne Workshop.

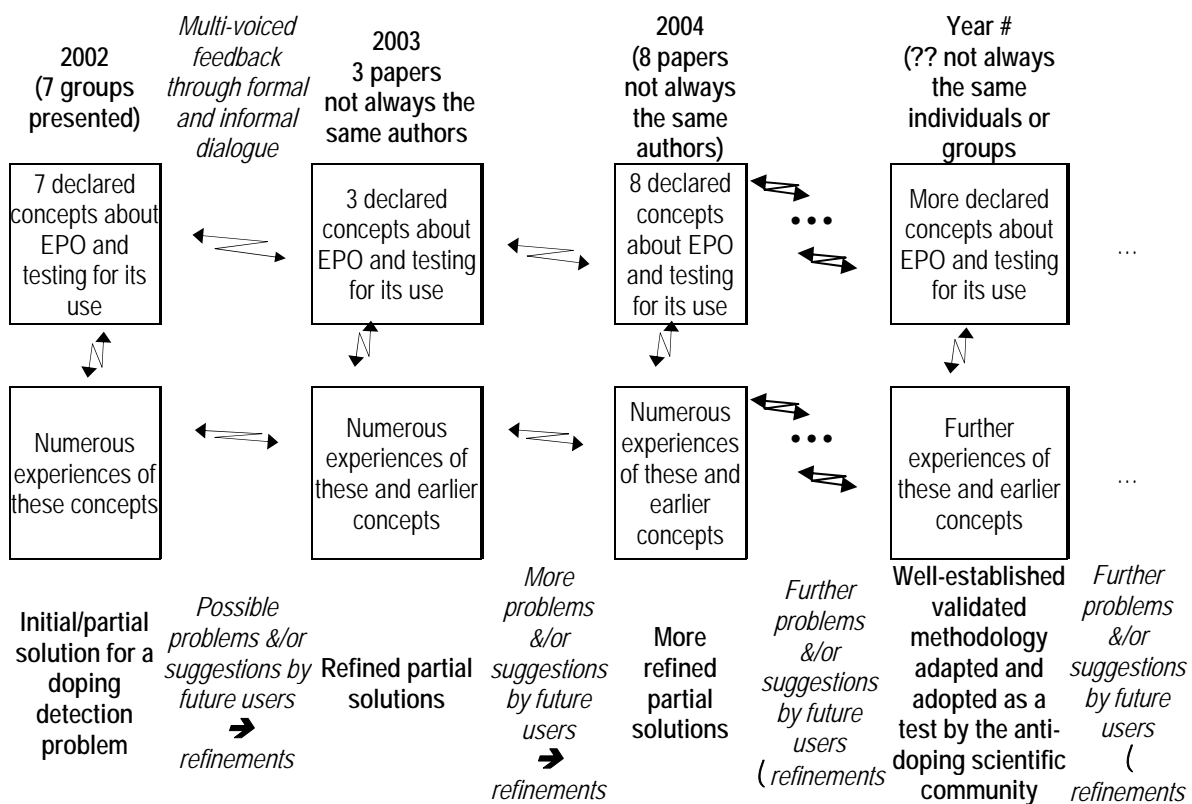


Figure 4: Knotworking a test for EPO

However, the growing number of accredited laboratories and an increasing percentage of less experienced directors raise questions as to how the benefits of the Cologne Workshop will be extended to accommodate these additional demands. Another question for this community relates to how the anti-doping scientific community can engage with experts from other disciplines with different understandings of professional behaviour, to ensure rapid creation and mobilisation of additional types of knowledge critical for doping control. For those in other expert communities there are questions about the benefits to be gained from having access to a trusted, private shared space similar to that of the Cologne Workshop.

Conclusion

The increasing complexity of 21st century workspaces challenges the experts who work in them. At the same time, this complexity challenges our understandings of the nature of the work that experts do, of knowledge mobilisation within expert communities, and of decision making based on expertise. This research into the high-profile, global field of anti-doping science has generated models for the evolution of these complex, multi-stakeholder, problem contexts, for the dynamics of the work of experts, and for the development and dissemination of the new knowledge. The research raises questions for both stakeholders and researchers about the expanding complexity of this field and other fields, about the effectiveness of current strategies to solve the wicked problem of doping in sport and about future strategies that will involve additional groups of stakeholders. It also invites 21st century experts in this and other complex workspaces to reflect on the further demands such expansion will place on current stakeholders as, together, they seek to maximise the effectiveness of their work by both improving the quality of their own work and through making the best use of interactions between stakeholders.

References

- Engeström, Y. (2000). Activity Theory as a framework for analyzing and redesigning work. *Ergonomics*, **43**(7), 960-974.
- Kurtz, C., & Snowden, D. (2003). The new dynamics of strategy: Sense-making in a complex and complicated world. *IBM Systems Journal*, **42**(3), 462-483.
- Rittel, H., & Webber, M. (1973). Dilemmas in a General Theory of Planning. *Policy Sciences*, **4**, 155-159.
- Snowden, D. (2002). Complex acts of knowing: paradox and descriptive self-awareness. *Journal of Knowledge Management*, **6**(2), 100-111.
- WADA. (n.d.). A Brief History of Anti-Doping. <http://www.wada-ama.org/en/dynamic.ch2?pageCategory.id=312> (Access date 10th February, 2006)

Acknowledgements:

I wish to acknowledge the assistance of and express my sincere gratitude to

- The members of the anti-doping community who participated in this research, and in particular to the organisers of the Manfred Donike Workshop who have allowed both interim finding and final outcomes of this research to be presented to the anti-doping scientific community and so provided opportunities for members of this scientific community to consider, challenge and co-configure the new knowledge generated by this research.
- Dr. Kathryn Crawford, my doctoral supervisor, who has guided this research since its inception in 2002.
- ACU National's Office of Research whose financial assistance contributed to the author's participation in the 2007 Cologne Workshop.