

Finding the fire: Numeracy and literacy for public safety volunteers*

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This paper is based on research conducted by Hayes, Golding and Harvey (2004) into the adult learning that takes place in volunteer fire and emergency service organisations in small and remote towns in Australia. This research investigated the literacy and numeracy skills valued by volunteers, their perceptions of their own skill levels and the impact these may be having in the context of the introduction of more formal systems of training and assessment. This paper also discusses the implications these findings may have for adult literacy and numeracy practitioners.

Volunteer-based public safety organisations play a vital role in preventing and reacting to bushfires and other local emergencies throughout Australia, particularly in rural and remote communities. This response is generally provided by local fire brigades and state and territory emergency service (SES) units. These organisations put considerable effort into training unpaid volunteers to respond to incidents and emergencies that may occur infrequently, but which require rapid and competent responses when they do. In the past, this training has tended to be informal and by means of hands-on training and practice. In recent years, changes in community expectations regarding training, legal pressures and changing emergency response technologies have resulted in existing and new volunteers being required to undertake more formal training and assessment in the skills they need to safely respond to a range of emergencies.

These new styles and expectations of training and assessment have raised issues relating to the literacy and numeracy levels required for both the necessary learning and the functional competencies of volunteers. Concerns have been expressed that literacy and numeracy issues are preventing some people from completing the necessary training, causing others to leave organisations because they are unwilling to expose their literacy issues to colleagues and discouraging new recruits from joining (Hayes & Ryan, 2001). Loss of volunteers as a consequence of training has implications for the volunteers themselves, their local fire brigades and SES units and the communities that rely on them for protection.

These issues are likely to be particularly pertinent in small and remote towns because the organisations themselves play an important community role that goes well beyond the critical voluntary fire and emergency service functions. In addition, voluntary organisations in small and remote communities draw deeply on the social capital (trust, reciprocity, networks) of community members in ways that makes the attractiveness of training and retention of volunteers particularly critical despite the likely difficulties caused by increasing geographic remoteness and small community size.

This paper reports on national research Hayes, Golding and Harvey (2004) undertook to investigate the numeracy and literacy skills that public safety volunteers value in their role, how they perceive their skills in these areas, and what impact the changes in formality of training and assessment may be having because of literacy and numeracy issues. The research also investigated what might be the most effective ways of facilitating learning of these skills in small and remote communities.

Methodology

A study was undertaken of 20 fire brigades and SES units in small and remote communities across five Australian states (New South Wales, South Australia, Tasmania, Victoria and Western Australia). In each state, four locations of varying geographic accessibility/remoteness (measured by ARIA—Accessibility and Remoteness Index of Australia—ARIA 1999) and population size were chosen and an appropriate fire brigade or SES unit selected. Details on the sites visited and how they were chosen are provided in Appendix A.

Each location was visited on two occasions. On the first visit, a discussion was held with the key informant in each brigade/unit (usually the officer in charge) and a small group of volunteers selected by the key informant. Network diagrams (Golding, 2002) were created during these discussions in order to identify the relationships within and between public service organisations and other local learning and community organisations. A separate interview was conducted in each location with a person involved with adult learning in the local community to develop a network diagram from their perspective. These network diagrams provided insights into the social capital ('the norms and networks facilitating collective action for mutual benefit': Woolcock, 1998) that existed within and particularly between organisations.

Following the first visit, surveys were distributed through the key informants to the volunteers. Collated results from these surveys (N = 329; response rate 73%) were used as the basis for small group interviews undertaken with volunteers and representatives from adult learning organisations on the second visit. In all, 230 volunteers and other community members participated in these on site group interviews.

Findings

Connections between organisations

Although there was considerable goodwill between public safety and adult learning organisations in the locations visited, there were not strong learning links between them.

Attitudes to learning

Volunteers identify as keen learners (95%) and almost all are involved in other local community organisations. The skills they learn through their public safety organisations are transferable to and demonstrably useful in other aspects of their community, home and work life. In this respect, the training being undertaken at local fire brigades and SES units is helping to build the capacity of communities and enterprises in rural and remote Australia.

With few exceptions, volunteers agree that some sort of training is required to learn how to perform their public safety role. Most volunteers would prefer this training to be hands-on and believe this is the best way for volunteers to be taught and to learn. In particular, many interviewees highlighted the value of the learning that takes place at real incidents such as fires and vehicle accidents and when undertaking roadside burning or similar 'real' activities.

Many people viewed the changes toward more formal accreditation of skills positively. Reasons for this included:

- The formal training and assessment further develops skills and increases confidence in performing the role.
- Volunteers can be more confident that others in the team have the skills required and can do the job asked of them, particularly at incidents outside the local area and in unfamiliar teams.
- The certificates and vocational competencies obtained are recognised and transferable. They can be used in other workplaces and, in some cases, to obtain paid work.
- The qualifications are recognised nationally and can be used as evidence of skills if moving from state to state or between public safety organisations.

The introduction of more formalised training and assessment is presenting challenges as well as opportunities, however. A number of volunteers, particularly those in older age groups, have left or are reconsidering their participation because of the perceived increasing demands being placed on them. Negative views of the changes included:

- The more formal approach to training is unnecessary, as volunteers have effectively dealt with incidents in the past without this.
- Prior learning, skills and knowledge developed over years of experience are not being recognised appropriately.
- The community is so small everyone has to be part of the brigade/unit anyway, whether formally trained and assessed or not. They are also unlikely to respond to emergencies outside their area.
- This is just an exercise in the 'powers that be covering their butts' for legal reasons.

- There is not enough time. Pressures on the small number of people in these communities who are often involved in a number of community activities are increasing, and formal training and assessment and the associated paperwork are just adding to these.
- There is concern about people's ability to successfully complete formal assessments because of literacy or other communication skills issues.
- People are leaving or not volunteering because of these perceived difficulties, and this has implications for the safety of the community.

Valued literacies

In the survey, participants were given a list of literacy and numeracy skills that might be required in their public safety role and asked to rate the importance of each to the brigade/unit on a scale of 'low', 'medium' or 'high'. They were also asked to rate their own skills in these areas on the same scale. The findings in relation to this question are summarised in table 1.

Table 1: Importance of skill to the brigade/unit and rating of own skills (% of respondents)

Importance to brigade/unit			Skill	Rating of own skills		
Low	Med.	High		Low	Med.	High
%	%	%		%	%	%
<1	10	90	Understanding spoken messages	2	45	53
1	12	88	Passing on spoken messages	2	44	54
<1	18	82	Reading maps of familiar areas	10	41	50
2	19	79	Reading and understanding dials on equipment	5	44	51
2	22	76	Reading maps of unfamiliar areas	16	49	35
6	25	69	Logging (recording) spoken messages	11	59	30
2	30	66	Reading and understanding training materials	5	51	45
4	31	65	Understanding messages on noticeboards	4	40	57
8	35	57	Conducting briefings	36	47	18
10	38	52	Writing reports	25	53	23
5	43	52	Taking part in meetings	10	50	40
11	46	43	Writing brief notes	15	55	31
10	46	43	Doing basic calculations	9	46	44
14	47	39	Leading meetings	35	44	21
18	46	36	Speaking in public	31	47	22
22	46	33	Writing letters	27	53	20
32	39	29	Using computers to find information	38	39	23
32	39	29	Using computers to prepare documents	45	34	22

Note: Sorted by importance to brigade/unit; N values ranged from 314 to 326.

The skills rated by most volunteers as being of high importance to the brigade/unit were understanding and passing on spoken messages. The ability to read maps of both familiar and unfamiliar areas was also rated highly, as was the ability to read and understand dials on equipment, both of which rely on numeracy as well as literacy skills.

Given the perceived importance of reading maps, both to find the incident and to safely exit from a potentially unsafe area, it is pertinent to note that 10 and 16 per cent of survey respondents respectively rated their own skills as 'low' for reading maps of familiar and unfamiliar areas. Only 35 per cent considered their skills were 'high' in reading maps of unfamiliar areas. Perhaps not surprisingly, respondents in leadership roles rated their ability to read maps of familiar and unfamiliar areas more highly than others (see appendix B, table B1). Even so, a small proportion (4–10%) rated their skills in these areas as 'low'. There were also significant differences in rating of map reading skills by gender: women were significantly more likely than men to rate their skills in this area as low (see appendix B, table B2).

'Doing basic calculations' was rated of high importance by only 43 per cent of respondents, although nearly half (46%) considered it of medium importance. Interestingly, most respondents rated their own skills in this area as medium or high; only 9 per cent rated their skills as low. Nevertheless, this would still translate into approximately 2 people in every group of 20 possibly requiring skill development in this critical area.

An area with some of the lowest ratings of skills was in the ability to use computers to find information or prepare documents (38% and 45% ranking their skills as 'low' in these areas respectively). Self-rating by leaders of their computer skills did not differ significantly from other respondents, with around one in three (32%) ranking their ability to use computers to find information as 'low'. Not surprisingly, older respondents were significantly more likely to rate their ability to use computers to find information as 'low' than younger participants (70% of those aged 55+ compared with 20% of those aged younger than 35 years – see appendix B, table B3). Gender differences were again found: women were significantly more likely to rate their skills as 'high' in these areas than men (see appendix B, table B2).

Interest in further training

Seventy-nine per cent of those surveyed 'were' or 'might be' interested in additional training in the areas listed. The areas of most interest were learning to read maps of unfamiliar and familiar areas (57% and 45% respectively), using computers to find information and prepare documents (52% and 51% respectively), conducting briefings (45%), writing reports (44%), logging radio messages (43%) and speaking in public (42%). Thirty-one per cent were interested in training in how to read the dials on equipment, and twenty-two per cent were interested in learning how to do basic calculations (see appendix B, table B4). As can be noted from this list, some of the areas of most interest (e.g. using computers, writing reports and speaking in public) were not necessarily rated as being of high importance to the brigade/unit (table 2).

Most of those surveyed (72%) would prefer any training in these areas to be provided through their public safety organisation, by either a trainer from within their brigade/unit or by someone from outside who is an emergency service trainer. A substantial minority (23%) would prefer the training to be provided by another local trainer who is not necessarily involved with their public safety organisation. The majority (82%) would like the training to be provided locally.

Impact of low literacy on participation

Fifteen per cent of those surveyed indicated that literacy was an issue for them and a similar proportion indicated that difficulties with their communication skills affected their ability to undertake some of their brigade/unit training. Given that these figures come from responses to a written survey, and that people are more likely to over-rate their literacy skills than under-rate them (ABS 1997), the actual proportion of volunteers likely to be having difficulty meeting the changing training and assessment requirements is likely to be higher.

In practical terms, this means at least three members in 20 (the average number of members for the brigades/units sampled) can be expected to require additional support to complete the necessary training due to underlying literacy issues. This is a substantial minority of brigade/unit volunteers.

How many members may have already left brigades/units recently because of difficulties with their communication and/or literacy skills in volunteer training contexts is unknown, though there were a number of examples provided anecdotally through the interviews. This finding supports research from the UK pointing out informal learning is of considerable value for skills acquisition and that 'accreditation may not be appropriate for all adult learners' (McGivney, 1999, p. 55). The prospect of accreditation may even act as a barrier to returning to study (WEA, 1998).

Literacy is also an issue for leaders of local organisations. The results from this study show that at least two to three leaders in every twenty are likely to currently experience difficulties with literacy skills and/or difficulties successfully completing training because of issues with their communication skills. This number is likely to increase as demands on leaders and their organisations increase. A number of interviewees pointed out that increasing demands on volunteers are already a major issue.

An important finding in the data was that a large proportion (40%) of the volunteers surveyed had completed 'Year 10 or below' as their highest level of formal education. This was particularly so away from the regional centres (33% for those in the locations closest compared with 46% of those in the locations furthest away) and particularly elevated by age (23% of those younger than 35 years compared with 67% of those aged 55 years or older). These volunteers were significantly more likely to agree or strongly agree that literacy and/or communication skills were issues for them and to find the written training materials and assessments difficult. They were also significantly more likely to rate their ability to use computers to find information as low (60% compared with 23% of those with higher educational levels).

It was frequently argued in the interviews that the perceived 'literacy problems' of volunteers might alternatively be explained by the inappropriate formality of some of the training.

We have a local young fellow ... and he has very poor skills; writing and reading skills, yet he worked for a local fertiliser contractor, and probably travelled into every local property and knew every creek crossing, knew everybody's laneways. He knew what gate led to what paddock because he knew them like the back of his hand. Now those skills, he could get you into a fire the safest way or, more importantly, get you out of a fire area, and yet, if he were to be involved in a map reading exercise, he would fail miserably. I'm not saying he mightn't be able to learn those map reading skills, but he would instinctively say no, I couldn't do that, and yet the very skills we are looking for are there.

While changes in information and computer technology have increased the range of skills required to undertake tasks in most workplaces and to competently undertake some tasks in many voluntary organisations, it was pointed out in the interviews that not all members of the organisation need the same set of high-level skills. Some of the least formally literate volunteers may be the most effective team members, particularly if other members recognise and accommodate for them in situations where reading, writing or communicating through new technology are important or are critical for basic safety.

The idea that fire and emergency service organisations require older, experienced volunteers with hands-on skills operating in teams rather than formally trained individuals working on their own was often mentioned. As one interviewee noted:

Most of the farmers are a bit long in the tooth ... hands-on they're good. When it comes to throwing around figures ... they're not as quick as others. But to do the job, they can go out and do it. No problem. They can do it as good as the blokes that read out of books.

Implications for numeracy and literacy practitioners

The research found that local fire brigades and SES units are important sources and sites of adult learning in rural and remote communities in Australia. Apart from the important role of facilitating social capital (trust, reciprocity, networks) and encouraging informal learning through regular training, they offer opportunities for volunteers, particularly men, to engage in formally accredited learning. In some small and remote communities these organisations are the only local source of accredited learning.

It is clear that the literacy and numeracy and 'learning to learn' demands on individual volunteers are going to increase over time in response to community expectations and legal pressures. This will in turn put pressure on trainers and assessors within public safety organisations to develop their skills further to ensure all volunteers can continue to access the training required. This will be best done by embedding the development of numeracy and literacy skills into training that is of direct use or interest to volunteers in their public safety role.

Given the overwhelming preference for practical, hands-on learning and training to be provided by someone from within (and usually at) the public safety organisation, as well as the dearth of literacy, numeracy and/or communication skills training available in a number of the communities visited, a strategy for developing the skills of volunteers would be to further develop the abilities of local trainers and other key people within the public safety organisations. In particular, to develop their abilities to deal with the wide range of learners in their training groups and to act as 'mentors' or support people for those currently experiencing difficulty with literacy, numeracy, communication or study skills. Training strategies, and training materials, need to be developed keeping in mind the likelihood of low formal reading and writing levels among volunteers, especially given the high proportion (40%) found in this study not to have completed formal schooling beyond Year 10.

Although there is considerable goodwill and positive feeling between local public safety and local adult learning organisations where they exist in the communities visited, the current links between them relating to education and training are quite weak or non-existent. Indeed, in some locations the local brigade/unit key informants were unaware of the other sources of adult learning that were available locally. There is considerable potential to develop these links further and to share resources and skills to benefit local public safety volunteers.

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Appendix A – Site details

The selected sites contained locations with a wide range of ARIA values available within a single region. These sites also had widely differing economic bases and growth prospects (Adams 2002, figure 2).

Table A1: Sites, locations and accessibility/remoteness (ARIA)

State / Region	Locations (ARIA*)
NSW / Murray	Gol Gol (near Mildura, 2.7), Balranald (4.3), Hillston (5.9), Clare (8.4)
SA / Eyre	Whyalla (2.5), Kimba (5.1), Wudinna (7.5), Streaky Bay (10.0)
TAS / Mersey-Lyell	Ridgley (near Burnie, 2.4), Waratah (3.5), Rosebery (4.4), Strahan (6.2)
VIC / Western District	Bochara (near Hamilton, 2.5), Coleraine (2.7), Goroke (3.8), Netherby (4.9)
WA / Great Southern	Torbay (near Albany, 3.2), Jerramungup (6.0), Hopetoun (7.6), Lake King (7.9)

*ARIA = Accessibility and Remoteness Index of Australia (see ARIA 1999): 0 indicates high accessibility, 12 indicates high remoteness. Region names are from Adams (2002).

All sites except South Australia¹¹ included one locality relatively accessible to (5 to 25 km from) a large regional city that was rural but 'accessible' as defined by ARIA and with a population of least 10 000. Each of the regional cities (Mildura, Whyalla, Burnie, Hamilton and Albany) provided geographical accessibility to a wide range of possible adult learning opportunities (e.g. a university campus, TAFE campus, ACE providers, private providers). Other locations in each site were selected because they were small, of increasing remoteness and with fewer or no local or nearby opportunities for adult learning.

¹¹ Since no fire or emergency service organisation existed 5 to 25 km from Whyalla, an SES organisation in the township of Whyalla was included in the study.

Appendix B

Table B1: Self-rating of selected skills by respondents in leadership roles (%)

Self-rating	Logging messages	Reading maps of familiar areas	Reading maps of unfamiliar areas	Using computers to find information
Low	7	4	10	32
Medium	51	32	44	42
High	42	64	46	27
Totals	100	100	100	100

N values ranged from 302 to 326

Table B2: Self-rating of selected skills by gender (%)

Self-rating	Logging messages		Reading maps of familiar areas		Reading maps of unfamiliar areas		Using computers to find information	
	Men	Women	Men	Women	Men	Women	Men	Women
Low	12	2	7	26	13	35	40	23
Medium	59	60	40	47	49	48	39	39
High	29	38	54	28	38	17	21	39
Totals	100	100	100	100	100	100	100	100

N values ranged from 302 to 326

Table B3: Self-rating of ability to use computers to find information by age group (%)

Self-Rating	Younger than 35	Age 35–54	Age 55 and older	All ages
Low	20	33	70	38
Medium	48	42	23	39
High	32	26	7	23
Totals	100	100	100	100

N=315

Table B4: Interest in communication skills training (% of those who were or might be interested in additional training)

Type of training	%
Reading maps of unfamiliar areas	57
Using computers to prepare docs	52
Using computers to find information	51
Reading maps of familiar areas	45
Conducting briefings	45
Writing reports	44
Logging spoken messages	43
Speaking in public	42
Reading/understanding training material	37
Writing letters	36
Leading meetings	36
Writing brief notes	32
Understanding spoken messages	31
Reading/understanding dials on equip.	31
Passing on spoken messages	31
Taking part in meetings	28
Doing basic calculations	22
N (Yes or Maybe)	260