



New Zealand Fire Service Research Report

Literacy, Numeracy And Communication Skills Among New Zealand Fire Service Volunteers

June 2016

Family Centre Social Policy Research Unit (FCSPRU)

Objectives: The aim of the study was to explore the types of difficulties volunteer firefighters might have had with literacy, numeracy and/or communication skills that may have compromised essential communication, good operations and/or safety, as identified by Chief Fire Officers or their Deputies.

Methods: This Report records the findings from 24 in-depth semi-structured interviews with Chief Fire Officers (CFO) or Deputy CFOs selected from five regions of New Zealand.

Findings: The results indicated that while senior Officers recognise that in some brigades there are volunteers with literacy and numeracy problems, all of them considered these problems were managed adequately, and did not compromise essential communication, good operations or safety. Though literacy problems did occur, they were infrequent and usually arose during training sessions where a minority of volunteers struggled. Numeracy problems were less common, with two thirds stating they didn't occur at all in their brigades.

There was agreement from most CFOs that training materials should adopt plain English style without compromising the educational standard. Skills training designed to enhance positive group cooperation were also recommended and basic computer skills courses were suggested for volunteers who struggle with modern technologies.

Recommendations: Recommendations that spring from the research are included.

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REPORT ON LITERACY, NUMERACY AND COMMUNICATION SKILLS AMONG NEW ZEALAND FIRE SERVICE VOLUNTEERS FOR THE NEW ZEALAND FIRE SERVICE COMMISSION



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EXECUTIVE SUMMARY

Objectives: The aim of the study was to explore the types of difficulties volunteer firefighters might have had with literacy, numeracy and/or communication skills that may have compromised essential communication, good operations and/or safety, as identified by Chief Fire Officers (CFO) and/or their Deputies. The research sought to ascertain the overall prevalence of such difficulties and identify the critical literacy, numeracy and communication skills required for good operations and safety, and any barriers to training, as highlighted by them.

Methods: This Report records the findings from 24 in-depth semi-structured interviews with Chief Fire Officers (CFO) or Deputy CFOs selected from five regions of New Zealand. There were 23 men and one woman. Interviews were conducted either in person (18 cases) or on the phone (6 cases) and were guided by researchers from Family Centre Social Policy Research Unit. Brigades were selected by the NZFS covering smaller towns and rural areas around the country. A combination of latent and manifest coding was used to identify both significant themes and responses to the research questions. The interviews took place during November and December 2015 and so this Report is based on research conducted prior to the integration of urban and rural firefighters under the new organisation, Fire and Emergency New Zealand.

Findings: The results indicated that while senior Officers recognise that in some brigades there are volunteers with literacy and numeracy problems, all of them considered that these problems were managed adequately, and did not compromise essential communication, good operations or safety. In most cases Officers responded to problems by placing 'the right people into the right job'. They also used supervision, mentoring and team work to assist, and divided responsibilities according to the strengths of the people. The Officers noted literacy problems did occur, but were infrequent and usually arose during training sessions where a minority of volunteers struggled. Numeracy problems were less common, with two thirds of CFOs stating they didn't occur at all in their brigades.

There was agreement from most CFOs that manuals and training materials should adopt plain English and use step by step explanations. The use of pictures and videos was also suggested. There was no suggestion that the educational standard of the learning material should be compromised, but that it should be made more accessible so as not to intimidate lower educated volunteers. A number of CFOs also recommended skills training for volunteers that would enhance positive group cooperation alongside their practical work as volunteers in the field. High among those were communication skills, social skills, assertiveness training and leadership training. As

some volunteers struggle with modern technologies, basic computer skills course were also suggested.

Recommendations: That NZFS should continue to recognise the valuable service given by volunteer firefighters throughout New Zealand. In the light of that and this Report, care should be taken to weigh any move to require higher capacities of literacy and numeracy competence for less literate and numerate volunteer firefighters against the risks of disruption to the collaborative brigade spirit and the likelihood of some volunteers quitting or refusing to apply.

The NZFS seriously consider adopting a plain English style of communication for all training materials with volunteer firefighters which is easy to read, understand, and act upon after just one reading.

The NZFS enable brigades access to good quality educational opportunities to develop communication skills, assertiveness skills, social skills, leadership training and basic computer skills.

Where a firefighter or firefighters do not have internet access or access to a computer, fire stations provide them not simply for secretarial and administrative use, but also for volunteers to use at least for training purposes.

INTRODUCTION

This research was commissioned by the New Zealand Fire Service (NZFS) and carried out by the Family Centre Social Policy Research Unit (FCSPRU). The interviews took place during November and December 2015 and so this Report is based on research conducted prior to the integration of urban and rural firefighters under the new organisation, Fire and Emergency New Zealand.

This research project was focused on literacy, numeracy and communication skills among a sample of volunteer firefighters and Station Officers working for NZFS. The aim of the study was to explore the types of difficulties volunteer firefighters might have had with literacy, numeracy and/or communication skills that may have compromised essential communication, good operations and/or safety, as identified by Chief Fire Officers (CFO) and/or their Deputies. The research sought to ascertain the overall prevalence of such difficulties and identify the critical literacy, numeracy and communication skills required for good operations and safety, and any barriers to training, as highlighted by them.

METHODOLOGY AND SAMPLE

This report records the findings from 24 in-depth semi-structured interviews¹ with CFOs or Deputy CFOs selected from five regions of New Zealand. There were 23 men and one woman. Interviews were conducted either in person (18 cases) or on the phone (6 cases) and were guided by researchers from FCSPRU. Brigades were selected by the NZFS covering smaller towns and rural areas around the country. The five areas were Southland and Canterbury in the South Island and Wairarapa, outlying areas of Wellington and outlying areas of Auckland in the North Island². Answers were transcribed and analysed anonymously. A combination of latent and manifest coding was used to identify both significant themes and responses to research questions, and the results are presented below. This Report covers the overall prevalence and nature of literacy, numeracy and other communication difficulties among NZFS volunteers, as identified by the research participants, and the critical literacy, numeracy and communication skills required for good operations and safety, and barriers to training, that they highlighted.

¹ The questionnaire is set out in Appendix A

² The full list of brigades interviewed is set out in Appendix B

RESEARCH FINDINGS

This is a descriptive report. Where tables show numbers, they do not imply statistical significance or causality. They are set out to help the reader understand the description better and indicate the numbers of participants who answered in the same way.

WAYS OF KEEPING VOLUNTEERS INFORMED

Officers were asked how they kept their members informed. As table 1 demonstrates, most said they were using **combined methods** to communicate with their members. In the majority of cases they **read the information out loud** to them at meetings or trainings, often made summaries or pointed out only important information, and explained and discussed the content.

If someone was missing from a meeting or training they used other ways to keep their members informed. The most common way was **putting printed information on a notice board**, or leaving it elsewhere in the room, followed by **using emails and text messages or other means of electronic communication (smart phones)**. They didn't use **intranet** very often, and they used **paggers** only for informing about urgent situations e.g. weather warnings. In rare cases they used a **phone** to catch up with a person who was missing for the main presentation of information. Very seldom were volunteers left to **get and read important information by themselves**.

Beside formal ways of informing volunteers there were sometimes informal occasions where important things were discussed, e.g. social occasions, barbecues or quiz nights, because they met together frequently.

Informing volunteers verbally remained the main way for the majority of Officers. In several interviews Officers mentioned that volunteers were reluctant to read emails and use the intranet:

"We have attempted to get them using e-mail but there is a reluctance to read what is sent."

"The majority of people have computers but they are not interested in logging in from home or here. Out of 10,000 only 1,700 log in."

In other cases, they lack internet access or computer skills

"They lack access at home and there is only one computer in the Station that is in the office and used by the secretary."

“Computer skills, e-mails etc. still freak out some senior members.”

Some Officers mentioned difficulties with using intranet:

“The Fire Service is slower to catch up with the internet. The intranet is appalling. It would be much more effective to develop online learning with videos and demonstrations. Information may be there on the intranet but it is impossible to find.”

Table 1: Means of informing volunteers

Means of communication	Main communication	Complementary communication
Officer reads the information at the meeting	23	
Printed copy (e.g. notice board)	1	14
E-mail		7
Text messages		4
Intranet		4
Phone		1
Pager		1

To conclude, Officers were in almost all cases informing their volunteers verbally at the meetings and they used other means of communication to catch up with those who were not present. The most common means of keeping members informed was to read from printed copies. There was some reluctance to use electronic means of communication, especially e-mails and intranet. This may be because of generational, psychological and/or accessibility factors, or caused by the current design of the NZFS intranet. Using verbal instructions compensated in for using other means of communication, in case the other means were not picked up.

LITERACY

Literacy difficulties

As table 2 shows, **out of 24 interviews, 16 Chief Fire Officers recognised there were some problems with literacy skills, but all of them said that these problems did not compromise essential communication or good operation.** In most situations, people with literacy problems received help from Officers or other volunteers, or they were assigned to positions where their literacy difficulties wouldn't affect the success of the operation, i.e. to a position where they didn't require reading or writing skills. Another way the problem was dealt with was to make sure that all the commands were given verbally. One CFO referred to a democratic process which prevents people with severe literacy problems joining the NZFS in his brigade: *"Recruits join on three months' probation and then are voted in by all members. Anyone with severe literacy problems would gently not be accepted into the brigade"*.

Table 2: Literacy difficulties

Are there some literacy difficulties?	Number of cases
Yes	13
Sometimes	3
No	8
Don't know	0

Table 3 summarizes the types of difficulties with literacy that CFOs observed in their brigade. In some cases, there were more than one difficulty present. In one case, the CFO himself has dyslexia:

"However he can write messages for his Brigade. Everyone can understand the communications that he sends out. He can do everything required of a CFO although he is dyslexic."

One of the Officers observed problems when higher levels of comprehension are required:

"Some plateau and can't progress to senior Firefighter or Station Officer level."

The overall numbers cited were very small, however.

Since all of the Officers agreed that there were no situations that posed a threat to essential communication, good operation or safety, they only reported minor situations, which happened in their brigade.

"There was a volunteer, who during a course couldn't communicate easily in a closed book test and the CFO aided him by reading for him and checking understanding."

“Another volunteer struggled with being able to express general English language punctuation and spelling for his test to progress to qualified ranking.”

Table 3: Observed difficulties

Observed difficulties	Number of cases
Difficulties with reading	5
Misspellings	4
Dyslexia	3
Need of help with reading and writing (<i>“form filling”</i>)	2
Low level of formal writing	1
Problems because English is not first language	1
Problems at an elevated level of comprehension	1

In other cases, Officers observed spelling difficulties as seen in *“jottings in the occurrence books”*. Reading difficulties were also reported when reading the training materials and when operating the radio. These same difficulties sometimes complicated proceeding through courses.

They also referred to **possible complications** which could occur with literacy, but never actually happened: These include:

- Writing when volunteers return from an incident
- Poor reading of dyslexic staff:

“Sometimes my guys have trouble reading chemical labels. That is where poor literacy could lead to unsafe operations in the field but it has never happened in all my years in the Fire Service.”

Frequency of problems

When it came to the frequency of problems caused by poor literacy skills, Officers considered they seldom occurred, but if they did they usually **happened once or twice during the last year** and they **didn’t occur regularly**, as shown in tables 4 and 5: *“This happens when something new comes in and is being introduced.”*

Table 4: Frequency of literacy problems

How often do these incidents happen?	Number of cases
Never	19
Once or twice a year	3
Three to five times a year	0
Six to ten times a year	0
More than ten times a year	0
Don't know	2

Table 5: Regularity of literacy problems

How regularly do these incidents happen?	Number of cases
Never	19
Not regularly	5
Sometimes	0
Fairly regularly	0
Very regularly	0

Where problems occur

Most of these situations occurred **during the training** as shown in table 6. Some Officers mentioned that it happened when something new was introduced e.g. in new modules: *“They need particular attention before they go on an appliance...they help newbies by going through the modules together.”* Problems during training occur *“predominantly when you get to more senior positions e.g. Officer, senior Firefighter, CFO.”* In one case the issue was related to radio static: *“Two blokes do like someone to sit with them to read the manual [meaning training materials].”* *“We found that poor literacy skills showed in jottings in the occurrence books”*, which occurred while preparing and recording incidents.

Table 6: Where incidents happen

Where do these situations happen?	Number of cases
During training	4
When preparing for incidents	1
When recording incidents	1
During operations	0
Elsewhere	1 when operating the radio

Officers' responses to literary difficulties

Officers had their own **ways of responding** to potential literacy issues and **preventing accidents**. They said they were aware of these matters and **offered help or placed the volunteers concerned into jobs where they are able to perform well**: *"We allocate jobs to the strengths of the people in the brigade so there is no threat to operations posed. If people can't read, they are told by the others. It does not hold them back. I help them when they can't spell or write."* Another Officer said we: *"Make sure that they are aware of issues and we check that they declare any difficulties. We organize reader writers for the training course. Those sorts of things. The guys buddy up and help each other, it's a team effort."*

One CFO offered confidential assistance in completing the reading tasks. Another CFO reported being very active in supporting volunteers: *"They need help with their writing so we use peer support so that someone sits with them to assist with written responses and language and spelling. CFO runs classes outside of training to help them complete all their assessments... He makes training fun with quizzes on different topics, working in teams and competing for prizes. He tries all kinds of innovative delivery of training. He gets them to learn in small groups and then one person has to demonstrate a process of use of equipment. This gives them confidence to talk in front of other Officers as some are diffident with their oral skills."*

Minimum literacy skills required

When CFOs were asked what minimum reading and writing skills they consider were required for the NZFS volunteers to be operationally competent and safe, they identified being able to read in a generic way. More specifically they referred to being able to fill in course work books and understand training materials as table 7 shows.

Table 7: Minimum reading and writing skills identified

Example of the skill	Number of cases
Reading	9
To be able to fill in course work books	5
Transferring messages from a callout from the pager to the whiteboard	1
Understand training materials	4
Copying numbers from the container and communicating this to others	1
Write a Registration number from a car and a phone number	1
Write a report (Officer level)	3
Understand basic instruction	1
Write a sentence	1

Officers tended to draw on different examples when describing what reading skills in particular they considered to be sufficient, as table 8 shows. Other Officers named educational milestones, which they considered indicated adequate competence in this area as table 9 sets out

Table 8: Examples of particular reading skills

Reading skills	Number of cases
Read a phone number	1
Read a Power Point presentation	1
Read a printed page	1
Read warning signs such as hazardous Chemical details	2
Equipment checks - read and tick a box	1
Read a paragraph of text and know what it means	1
Read the numbers and names out loud over the radio	1
Read reasonably	1

Table 9: Educational milestones identified

Educational milestone	Number of cases
Primary school education	1
Intermediate school level	1
3 rd form (year 9) basic skills	1
Completed year 10	1
School Cert or NCEA Level 1	3
Good competence year 11 or 12	1
5th form School Cert minimum with reader and writer	2

Five Officers didn't consider reading and writing to be necessary as long as volunteers were able to operate in their job. The following quotations illustrate their reasoning:

- *“At the lowest (bottom level) they do what they are told to do. Higher up they need to read.”*
- *About a volunteer with reading difficulties: “I’d hate to think this 40 yr. old couldn’t get into the Fire Service because his reading skills were poor. Once the ideas are taught to him he gets it. On courses he knows the material from prior exercises and preparation.”*
- *“Education background is not important. Passion to do the job is what is important and then you can learn on the job hands-on.”*
- *“Writing is not so important unless you want to get promoted to Officer Rank. There will always be some with limited writing skills. It is important to have a mix of backgrounds in your volunteer brigades.”*

- *“I don’t think it is hugely important. One or two can be absorbed if they have other skills. It’s not a barrier to membership. For Officer status it’s probably more important.”*

Barriers to improving literacy skills

The Officers identified a number of barriers to improving literacy skills. They can be divided into the following categories: Psychological, Educational, Training and Societal.

Psychological barriers: A number of Officers considered some volunteers with few literacy skills were embarrassed to admit to it for fear of judgement from fellow volunteers and being seen as weak. Similarly, some volunteers lack confidence. They “don’t think they can do it.” or “they have given up”. Some men who had problems reading texts and emails, depended on their partner/wife to read it for them, and indeed all their text and email communication. They said they would be embarrassed to ask colleagues for help, but were not embarrassed asking someone from their immediate family. Lack of family support and negative school experiences were noted by two different people as providing psychological barriers for some volunteers improving their literacy skills. One Officer referred to a volunteer with a domineering father, who influenced his confidence: *“A history of the father’s domination made him seize up whenever he was unsure of the expected response.”* Likewise, previous negative school experiences could also provide obstacles for engaging with further education. *“I hated school and failed tests. I would not want to go back to a formal classroom.”*

One Officer emphasised the importance of a supportive work environment: *“Volunteers need to be in a right environment that nurtures them. Such volunteers won’t ever go up in the ranks. They get into a comfort zone. We need to encourage and mentor them along.”* The numbers referring to psychological barriers are set out in table 10.

Table 10: Psychological barriers to improving literacy

Psychological barriers	Number of cases
Embarrassment	3
Lack of confidence	2
Family background	2
Negative school experiences	1
Work environment	1

Educational barriers: Reference was made to the inability of some older volunteers to become computer literate. Some brigades had helped people overcome this problem, because in a modern

age so much learning is computer based. It was also pointed out that most adult courses for improving skills require at least elementary reading and writing competency, which prevents those who have very little, from participating in further education.

Training barriers: A number of Officers referred to the complicated language in training materials that created barriers to further learning. *“The language in the training manuals [meaning materials used for training] is average at times and we sometimes can’t understand them. Peculiar, at times nonsense, ambiguous.”*, *“Training material is off putting.”* Others referred to volunteers in their brigades who struggle with training assignments and don’t have laptops. *“In their minds they do not think they can do it. They need less written material and more pictures, video and they would perform better with verbal not written assessment of knowledge and skills. This would encourage them to go on with their learning.* This issue will be described in more detail in the section of this report entitled Additional Observations.

One Officer spoke of the lack of support from National Headquarters (NHQ) as a barrier to further learning. *“From my years of experience I am disappointed with the support that volunteer brigades get from the National Office and the lack of respect that paid officers have for volunteer brigades.”* The numbers referring to training barriers are set out in table 11.

Table 11: Training barriers to improving literacy

Barriers related to training	Number of cases
Complicated language in NZFS materials	2
Struggle with the training assignments	2
Lack of support from NHQ	1
Lack of laptops	1

Societal. Barriers: One of the Officers described the societal change he was observing in his brigade, as being a barrier to learning: *“We do not repair our household implements and so the effect is that people arrive less able to understand at a gut level how to adjust, fix, maintain things. This knowledge in the past was hands on and recruits arrived with it, off the farm or workshop.”*

Another Officer mentioned sexism as a barrier: *“The Fire Service is a macho male culture, admitting a weakness could be a barrier. This is a ‘doing’ action culture and ability in physical tasks is what is respected. Intellectual abilities are not highly valued. This is where sexism sometimes comes in as women volunteers tend to be more intellectual.”*

Three Officers saw lack of time as an obstacle for volunteers to proceed with their education. *“They have to make decisions where to put their effort as these are volunteers and have to balance a job, family demands and their volunteer time.”*

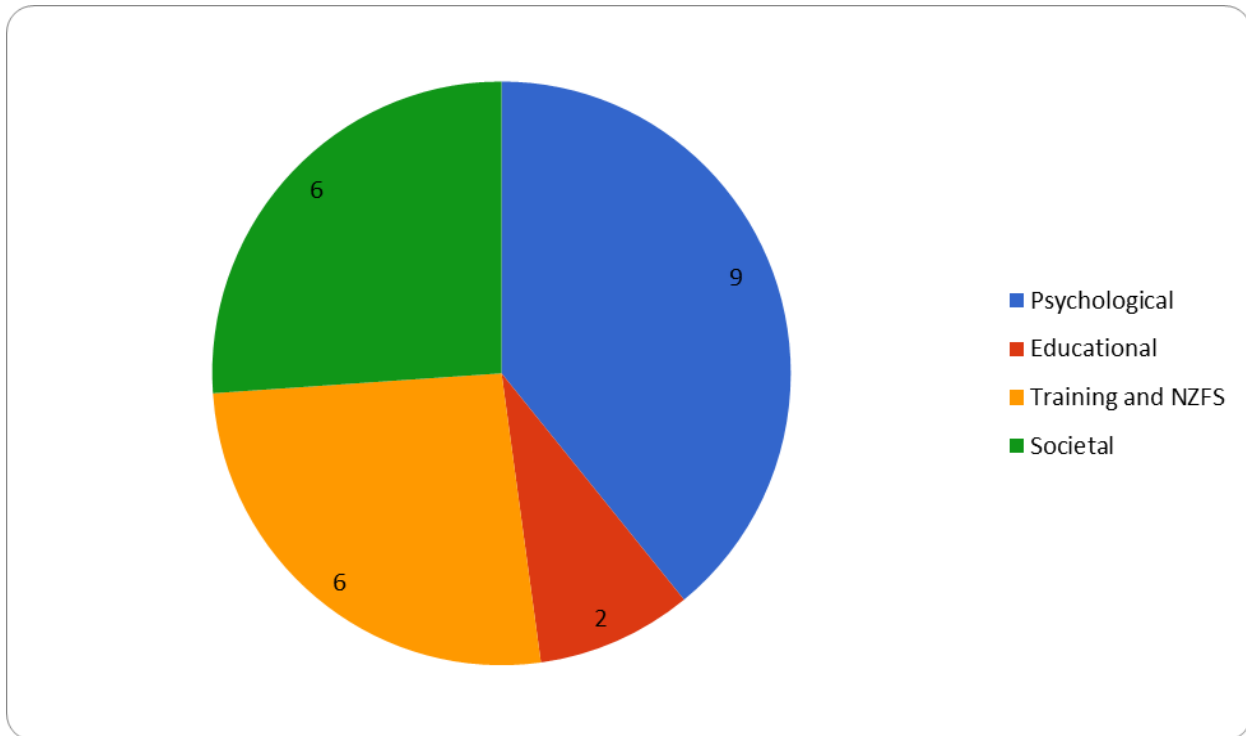
A further Officer interestingly noted that simple lack of interest can be an issue, since some of the volunteers are functioning well in everyday life without literacy skills: *“A few years ago our secretary resigned. I appointed one from the Brigade who was unable to perform secretary duties as he was unable to read or write or spell. I hadn’t realised his difficulties at the time and had seen him as a Station Officer prospect and had offered him a TAPS programme. In his day to day life and work as a truck driver he was ok and he had learned how to pick up skills and what was going on from others. He had dealt with this his whole life (at the time in his early 40s). We offered him support with his training materials but he was not interested in further adult education to develop his reading and writing skills.”* The numbers referring to societal barriers are set out in table 12.

Table 12: Societal barriers to improving literacy

Societal barriers	Number of cases
Change in society functioning	1
Sexism	1
Lack of time	3
Lack of interest	1

Distribution of barriers: The following figure 1 demonstrates the distribution of these categories, based on how many Officers referred to them as a barrier to improving literacy among volunteers. The most common barriers identified by the Officers were psychological, followed by training and societal obstacles. These topics will be further discussed later in the text.

Figure 1: Distribution of barriers to improving literacy



NUMERACY

Numeracy difficulties

As table 13 demonstrates, **17 out of the 24 brigades said they experienced no difficulties with numeracy among the volunteers.** *“It would be even less visible than literacy, it is not a common task”, “unlikely, never happened here”.* **There were four cases when they observed some numeracy difficulties, but not to the extent that it would compromise essential communication, good operation or safety.** *“Yes they have numeracy difficulties, however only with complex maths, not the simple maths tasks required of them. These difficulties would not cause safety issues.”* One Officer said sometimes there were difficulties, but he organised others to carry out the tasks in question. *“When you go to a call you have a mix of volunteers. Officers do the calculations and tell others what to do.”*

Table 13: Numeracy difficulties

Are there some numeracy difficulties?	Number of cases
Yes	4
Sometimes	1

No	17
Don't know	2

The Officers noticed some numeracy difficulties, but they considered them to be minor and would not compromise an operation or safety. The difficulties they referred to are set out in table 14.

Table 14: Observed difficulties

Observed difficulties	Number of cases
Calculating	1
Understanding tables	1
Measuring	1
Complex maths	1
Recalling technical details	1
Knowing what a diameter is	1
Knowing what depth is	1
Hydraulics	1
Understanding breathing apparatus control procedures	1
Mental subtraction	1

When asked to describe incidents where numeracy difficulties may have jeopardised essential communications, good operations or safety, the Officers consistently responded by stating that they simply put the right people in the right job or make sure that the person with the difficulty has supervision: *“He won't do anything wrong – he'll wait to be directed/told to be sure what's to be done.”*, *“I use those who can in situations and not those who can't.”*

A few Officers nevertheless gave examples of difficulties in minor situations, which did not compromise essential communication, good operation or safety. These are set out below in table 15. Others talked about general difficulties but didn't provide an example.

Table 15: Numeracy difficulties in minor situations

Examples of minor situations	Number of cases
Pump work	1
Pre-Officer book assignments	1
Assignments to become a senior	1

Frequency of problems

By far the majority of Officers stated that there was no occurrence of numeracy problems in their brigade. For the three that had experienced problems, they said they involved only minor situations, happened once or twice a year and they didn't occur regularly as tables 16 and 17 show.

Table 16: Frequency of numeracy problems

How often do these situations happen?	Number of cases
Never	21
Once or twice a year	3
Three to five times a year	0
Five to ten times a year	0
More than 10 times a year	0

Table 17: Regularity of numeracy problems

How regularly do these situations happen?	Number of cases
Never	21
Not regularly	3
Sometimes	0
Fairly regularly	0
Very regularly	0

Officers' responses to numeracy difficulties

As already referred to above, Officers responded to numeracy difficulties in much the same way as they responded to literacy difficulties. A common strategy was putting the right people into the right job. If some volunteers had numeracy difficulties, Officers would avoid placing them in jobs where they needed to carry out numeracy tasks. *"We need at least 2 to be proficient with the whole operation others can be 'foot soldiers' and be told what to do."*

They also stated that the initial training course which volunteers were required to complete sorted out numbers of people who had difficulties with numeracy: *"The initial training (7 day) recruit course weeds out the weakest at math etc. They don't tend to stay."* Or there are some specific courses for specific jobs: *"Pump training course has to be completed prior to operating. About 50% Fire Service people need to know how the pump pressure is maintained."*

Minimum numeracy skills required

As when naming the minimum literacy skills required by volunteers, a broad range of numeracy skills were also named. Table 18 sets out the minimum general skills and table 19 sets out the pump specific skills:

Table 18: Minimum numeracy skills identified

Specific numeracy tasks	Number of cases
Counting	6
Basic mental arithmetic	6
Volumes (e.g. of water in the tank)	6
Pressures	1
Ratios " <i>Mixing of 2-stroke fuel with set ratios of oil to fuel</i> "	1
Read and understand numbers/gauges	5
Understand breathing apparatus air levels	4
Keeping track of the tally board	2
Know about gradients of ladders	1
Financial literacy skills/management of money skills	1
Estimations of distance and height	3
Calculate duration times	1

Table 19: Minimum pump related numeracy skills

Tasks related to pump	Number of cases
Length of hose and capacity of pump	2
Pump training course has to be completed	6
Water pressure	5
How much water to foam	1
Portable pumps and pressures reading gauges	1
Calculate frictional loss	2
Learning to pump water uphill from a river	1
Water volume in hose	1

Some Officers named minimum numeracy educational milestones, which they consider to be sufficient for volunteers. These are set out in table 20:

Table 20: Educational milestones identified

Educational milestone	Number of cases
Pass the 7-day training course	1
Drivers course	1
End of primary school	1
Intermediate school	1
Year 7-8	2
3rd form	1
Year 10 pass in math	1
Year 11	1
Level I NCEA	3
School Cert level of achievement in science and math	3

Four Officers didn't consider numeracy to be necessary, "*everything is practice,*" and four Officers identified skills they considered to be necessary at Officer's level, which are set out in table 21:

Table 21: Minimum numeracy skills for Officers

Numeracy skills necessary at officer's level	Number of cases
Be able to do reports	1
Know pressure, volume and areas	1
Multiple hoses, flow and pressure uphill	1
Do calculations quickly in their heads while on the ground at an incident	1

Barriers to improving numeracy skills

The Officers identified a number of barriers to volunteers improving their numeracy skills. The barriers can be divided into following categories: Psychological and general.

Psychological barriers: As with the barriers to literacy improvement, the barriers to further numeracy development included psychological factors. People felt embarrassed being adults who were only semi-numerate, and tended to be covert about it so as not to display any weakness to others in the brigade. Fear was another named factor which Officers said could be general or connected to a particular activity, like operating computers. A negative attitude towards maths or towards themselves could also act as a barrier for volunteers. The work environment, and especially the personality and people skills of the CFO, was identified as playing an important role which could provide a barrier or an encouragement to further learning: "*An incompetent CFO without people skills, an insensitive CFO. These are the biggest barriers to learning.*" The numbers referring to psychological barriers are set out in table 22:

Table 22: Psychological barriers to improving numeracy

Psychological barriers	Number of cases
Fear	2
Embarrassment	4
Dislike of Self	1
Dislike of Maths	1
Insensitive CFO	1

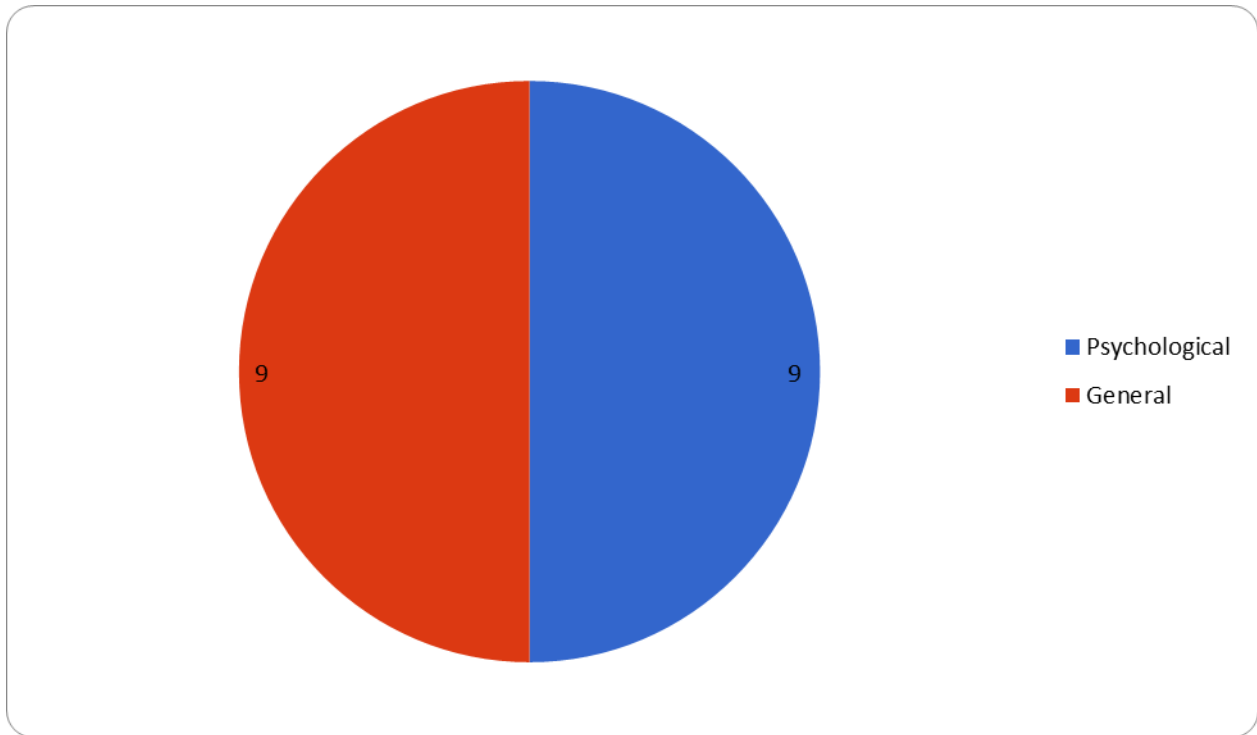
General barriers: As would be expected, the general barriers named were similar to the literacy ones. They noted both the lack of interest and lack of time for improving skills, played a role. One Officer referred to age as an important factor: *“They have an established work career and they are parked up at a comfort level. Returning to year 8 – 9 maths does not appeal to them.”* The availability of adult learning courses can create a barrier: *“They do not always want to go to a high school for adult night courses.”* Another Officer mentioned that hold ups in the application process can be also provide barriers: *“Hold up in the application process disenchant the applicant. The amount of time commitment involved is huge in some people’s eyes.”* A macho male culture that valued physical capabilities over intellectual ones was also named as being sexist by one Officer. The numbers referring to general barriers to improving numeracy skills are set out in table 23.

Table 23: General barriers to improving numeracy

General barriers	Number of cases
Lack of interest	2
Age	1
Lack of time	3
Availability of adult learning	1
Hold up in the application process	1
Sexism	1

Distribution of barriers: Figure 2 demonstrates the distribution of the psychological and general categories, based on how many Officers referred to them as a barrier to improving numeracy among volunteers. Interestingly, the numbers naming psychological barriers were equal to the total of all the other named barriers. This will be further discussed later in the text.

Figure 2: Distribution of barriers to improve numeracy



COMMUNICATION

During the interviews Officers spoke about communication within their brigades.

Social and communication skills

There was a demand for courses on social and communication skills by CFOs for their volunteers. They considered it important for the good functioning of their brigades. Table 24 below shows the types of skills they would like their volunteers to have.

Table 24: CFOs recommended skill training for volunteers

Social and communication skills	Number of cases
Communication skills	6
Social mediation	2
Assertiveness	4
Conflict resolution	1
Leadership	4
Social skills	4
Relationship skills, comradery/ team building	1
Time management	1

“It could be useful to have training in the H.R. area. They are respected for their skills but H.R. could well be looked at. They have local businesses and are practical hands on farmers, mechanics builders etc., and communication skills could be helpful.” Communication, assertiveness training, leadership and social skills ranked the highest.

Technology

The Officers observed that some members of the brigades find computer technology challenging. They may lack skills, or they lack access or they are reluctant to use them. They find this particularly with older volunteers. They are often reluctance to answer text messages and emails, and this complicates an efficient communication process. One CFO talked about the problem with delivering alerts for call-outs to everyone’s phone: *“Alerts for call-outs are sent to everyone’s phone and not just the CFO. Some of the volunteers will look to see what it is, think I don’t want to attend that in the middle of the night, think it is not very urgent and that they don’t need many to attend, so they just stay in bed.”* More generally, one Officer said: *“the majority of people have computers but they are not interested in logging in from home or here. Out of 10,000 only 1,700 log in.”* Table 25 shows the numbers of Officers concerned about technological competence among their volunteers.

Table 25: Problems regarding technology

Problems related to use of technology	Number of cases
Struggle with computers	4
Reluctance to answer emails and text messages	3
Problem with informing about call outs	1

Radio related issues

Some Officers considered the radios didn’t work properly, and that this led to people being unsure about using radios: *“A number of people in the FS are scared of the radio (LMR). They tend to be wary, to vacillate between confidence and breakdown of confidence. It’s something one gets used to. Two who are about to be promoted to Officers are unsure of the radio.”* Others say people: *“are laughing at me listening to the messages?”* Radio codes and jargon provide problems for some volunteers. *“The codes and jargon to use are sometimes hard to recall but they have a sheet in front of them to refer to.”*

Auditory problems

There were two cases of auditory problems recorded among the volunteers:

“We have one person with auditory problems. It is stressful for him as he does not always hear the exact detail of the message. This has only happened during training when a lot of information is being presented in a session.” Another Officer noted: *“Background noise causes problems. Loudness gets in the way.”*

Aggression or disrespect

In a small number of brigades there have been problems with aggression and disrespect. Two Officers identified aggression as a problem in their brigades and one Officer expressed strong dislike of harassment occurring in his or other brigades: *“Do not put up with harassment - would get HR in to deal with it. Nip it in the bud. No speaking down to others.”* A similar view was expressed by three Officers about bossiness and aggression in brigades: *“Leadership needs to be cool, calm and reassuring. The worst leadership is the sort that doesn’t stand back. People skills are the most important.”* *“Tyrants and tyranny needs to be weeded out and those who cannot operate otherwise dismissed from service. They do more harm than good.”* Sometimes volunteers experience disrespect from professional firefighters *“Volly versus Career (the latter sometimes pull rank). Sometimes a career person might not respond to a volunteer officer.”* Volunteers experience sexism as well: *“Sexism applies sometimes when women from one brigade interact with an equal rank from another brigade.”* The numbers of Officers expressing concern about issues of aggression or disrespect are set out in table 26.

Table 26: Officers’ concerns about aggression or disrespect

Aggression or disrespect issues	Number of cases
Harassment	1
Aggression	2
Sexism	1
Bossiness	3
Disrespect from professional firefighters	1

Language and experience

One Officer referred to problems with differing accents for speaking and/or understanding. Another Officer expressed concerns about the lack of experience with some new recruits: *“I think we need*

to recruit people who have finished at least Year 11 and have been out of school with some other experience before joining up.”

ADDITIONAL OBSERVATIONS

There were a number of consistent themes that Officers referred to when speaking of learning materials and processes.

- Most of the Officers would prefer the learning materials to be simplified and more accessible *“Because volunteers are embarrassed by their literacy weaknesses and intimidated by the whole assessment process they are reluctant to try and progress up through the organization”*. This CFO says 60% of his Brigade have leadership potential but lack the foundations to progress into Officer ranks. *“There needs to be incentives to make them want to learn, improve training materials and assessments so they are not so intimidated.”*

“In their minds they do not think they can do it. They need less written material and more pictures, video and they would perform better with verbal not written assessment of knowledge and skills. This would encourage them to go on with their learning.” This CFO believes they also need training by those outside the Brigade especially by paid FS people.

- Some Officers would appreciate access to training materials on-line. *“The Fire Service is slow to catch up with the internet. The intranet is appalling. It would be much more effective to develop online learning with videos and demonstrations. Information may be there on the intranet but it is impossible to find.”*
- There was consistent concern expressed about the inaccessibility of much of the material sent from the NZFS NHQ, particularly operational instructions and training materials. *“Operational Instructions sent out to brigades are near impossible to understand as they have terrible grammar and sentence structure. Every 6 months they have ongoing training as revision for some topic such as flammable gases, Health and Safety. These arrive as a series of Sheets of A4. They sit down as a team to answer them. As a group they try to figure out what the question is getting at. It is often only when they look at the next sheet with the answers that they can understand the question.”*

“The language used in NZFS communications and instructions is too abstract, detailed and complicated. Volunteers can read the words but not grasp the concepts. All instructions need to be in plain English. Volunteers understand best by show and tell through images. Hands-on learning is even better. The book work for new recruits is daunting and it puts people off joining. For example, First Aid terms are too hard to even pronounce, let alone remember. Most of what they we need to learn is commonsense and does not need to be presented in such complicated language.”

“The wording of some of the documents is awful. I was a journalist. I have been asked by others what on earth that was about and have had to explain it. HO [Head Office meaning NHQ] documents need interpretation. The Fire Service written communication needs to improve. Be written by someone who had learned the subject but is not totally au fait with it. It needs to be in plain English, step by step.”

“Communication needs to be in plain language. It is hard to understand definitions on the online incident report forms. The choice of options is not always appropriate for the incident that has been attended.”

- Although many Officers wanted more accessible material sent from the NZFS NHQ, they did not want a dilution of necessary or helpful information. *“Dumbing down of the material might cause a loss of people who have a high standard of education. Fear that might lose very excellent people – because of pencil headed office decisions. Some volunteers have a high level of competency in trades certification and academic degrees they can be put off by material that is too simple.”*
- Some Officers consider that mentoring would significantly improve learning. *“If we see a weakness we address it. We mentor all new recruits. The need is for mentoring, rather than help with literacy skills. For example, a Fonterra manager is mentoring one of our Maori recruits to give him confidence to go a step further and move up to being a Station Officer. He just needed mentoring though the training courses. Brigades need young fit energetic recruits at the coal face and senior Officers with experience and overview.”*
- Some Officers expressed frustration when dealing with NHQ:

“We’d like to be able to manage the skills of HO [Head Office meaning NHQ] like they manage us because the system fails. We need to chase up all of the time. That seems unprofessional.”

Regarding a specific process, some would appreciate a reduction of the time commitment during the application process. *“Hold up in the application process disenchant the applicant. The amount of time commitment involved is huge in some people’s eyes.”*

DISCUSSION

The results indicated that while senior Officers recognise that in some brigades there are volunteers with literacy and numeracy problems, all of them considered that these problems were managed adequately, and did not compromise essential communication, good operations or safety.

In most cases Officers responded to problems by placing 'the right people into the right job'. They carefully placed volunteers into tasks where they could perform well or where someone was able to support them. They also used supervision, mentoring and team work to assist, and divided responsibilities according to the strengths of the people. Officers often responded with flexibility and resourcefulness and put a lot of effort into helping volunteers overcome obstacles they faced.

The Officers noted literacy problems did occur, but were infrequent and usually arose during training sessions where a minority of volunteers struggled. Numeracy problems were less common, with two thirds of CFOs stating they didn't occur at all in their brigades.

These findings suggest to the NZFS that there are few literacy and numeracy problems among volunteer firefighters, and where they do exist they are well managed and do not compromise communication, good operations or safety. It should be noted though, these are the results of interviews with CFOs or Deputy CFOs. While they can be expected to have a broad knowledge of their brigade members, they may also be protective of members and not want further NHQ literacy or numeracy requirements to be added to their training and capacity building load. This is not to suggest the CFOs biased information, but that this research simply presents the focus provided by them and the authors cannot conclude from that, that communications, good operations and safety will never be compromised by the current literacy and numeracy capacity of volunteer firefighters.

That said, NZFS can feel some considerable confidence that there do not appear to be serious problems in this area. While there are some volunteers who could helpfully improve their literacy and numeracy capacities, the pressure of requiring them to do so needs to be weighed against the risk of losing members who may be either deeply embarrassed or simply not prepared to give further volunteer time. Adults who lack these skills have often experienced humiliation and have learned to live around those disabilities. The task of moving on from that can be very challenging.

Alongside that, it was noticeable that the volunteer brigades appeared to possess the sense of a local social group that gave honourable service and worked together in a spirit of collaboration

whereby each helped the other. There was an impressive sense of belonging and service that moved the interviewers as they travelled to different brigades. So the view of the CFOs that, where there were literacy and numeracy deficits, a mixture of teamwork and sound management could prevent threats to their service, has some validity.

There was agreement from most CFOs that training materials should adopt plain English and use step by step explanations. The use of pictures and videos was also suggested. There was no suggestion that the educational standard of the learning material should be compromised, but that it should be made more accessible so as not to intimidate lower educated volunteers.

A number of CFOs also recommended skills training for volunteers that would enhance positive group cooperation alongside their practical work as volunteers in the field. High among those were communication skills, social skills, assertiveness training and leadership training. As some volunteers struggle with modern technologies, basic computer skills course were also suggested.

These recommendations from the CFOs could be implemented within brigades to lift volunteer capacity without compromising the culture of collaboration and service that is well developed within most of them.

RECOMMENDATIONS

1. That NZFS continue to recognise:
 - a) The honourable service given by volunteer firefighters throughout New Zealand and the sense of belonging and collaboration that has developed in most brigades.
 - b) The reasonable (though not perfect) grounds outlined in this Report, based on interviews with CFOs, for NZFS to have confidence in the ability of its CFOs to manage the literacy and numeracy problems of a small minority of volunteer firefighters.
 - c) Care should be taken to weigh any move to require higher capacities of literacy and numeracy competence for less literate and numerate volunteer firefighters against the risks of disruption to the collaborative brigade spirit and the likelihood of some volunteers quitting or refusing to apply.

2. That NZFS seriously consider adopting a plain English style of communication for all training materials with volunteer firefighters which is easy to read, understand, and act upon after just one reading. Plain English is now quite common in government, commercial, legal, and leisure documents and activities, because it makes language and concepts more accessible without compromising genuine complexity or quality.
3. That NZFS enable brigades access to good quality educational opportunities to develop communication skills, assertiveness skills, social skills and leadership training. These can be expected to enhance positive group cooperation and the practical work of being a volunteer firefighter.
4. That where a firefighter or firefighters do not have internet access or access to a computer, fire stations provide them not simply for secretarial and administrative use, but also for volunteers to use at least for training purposes. Making basic computer skill sessions available, without compulsion, will encourage elementary IT participation.

Appendix One

Question Line for NZFS Key Informants on Literacy and Numeracy Practical Capabilities

Begin by engaging warmly with the interviewee/s. After initial greetings and short discussion explain in simple and clear language that the interview is being carried out to inform the New Zealand Fire Service about the levels and types of competencies of literacy and numeracy skills required for volunteer firefighters and station officers to manage operational and safety risks.

Explain that we want to interview them because they are experienced members of the NZ Fire Service and carry responsibilities. We are seeking their expertise to help us identify and analyse practical incidents where learning difficulties or low literacy and numeracy may have created problems with essential communication, good operations and possibly safety in order to provide better support for the Service. **We are interested in:**

- 1. your experience, descriptions and views about these matters,**
- 2. where they occur e.g. during training, operations, at the base or elsewhere,**
- 3. the prevalence you see in your brigade,**
- 4. any barriers to volunteer engagement in literacy and numeracy learning where it is needed that you can identify.**

If they are happy to participate, invite them to sign the consent form.

If they sign the consent form, please record the following:

Interviewer's Name: _____

Interviewee's Name (will remain confidential): _____

_____ Number 01

NZFS Area: _____

Brigade Name: _____

Position: _____

Date: _____

01

1. How do you keep your members informed? Do you read key information out to them or do you expect them to read it themselves?

2. In your opinion, do you think that some of the fire service volunteers have difficulties with *literacy*? i.e. Do they have difficulties for example reading instruction training materials, writing incident reports or understanding spoken instructions? Might these difficulties compromise essential communication or good operations for your brigade?

- Yes
- No
- Sometimes
- Don't know

Prompts:

Have you noticed any members ;

- Having trouble reading the weekly check sheets?
- understanding what has been said or expected?.
- Has anyone said "repeat that please or I can't read?"
- Have you noticed anyone hanging back or asking other people for help reading?
- Have you noticed anyone not turning up when it is their turn to read something?
- Have you noticed people miss understanding a verbal situation because English is not their 1st lgg?

3. Could you please briefly describe 3 situations or incidents where the difficulties a volunteer or volunteers had with literacy, in your opinion, posed a threat to essential communication, good operations or safety for your brigade?

Situation/Incident 1

What action did you take?

Situation/Incident 2

What action did you take?

Situation/Incident 3

What action did you take?

4. How often do you estimate these situations or incidents happened in your brigade during the last year?

1. Never

2. Once or twice

3. 3 to 5 times

4. 6 to 10 times

5. More than 10 times

5. How regularly do you estimate these situations or incidents happen?

1. Never

2. Not regularly

3. Sometimes

1. Fairly regularly

2. Very regularly

6. Where do these situations or incidents happen?

1. During training

2. When preparing for incidents

3. When recording incidents

4. During operations

5. Elsewhere. Please state where

If elsewhere please state where:

-
-

7. What types of reading and writing difficulties have you noticed some of the volunteers have, or you have been told about, that jeopardise essential communication, good operations or safety?

Check-List: English as a second language, dyslexia, serious reading difficulties, serious writing difficulties, learning difficulties, [If they offer other examples- these to be added]

-
-
-

-
-
-

8. What are the minimum reading and writing skills you consider are required for fire service volunteers to be operationally competent and safe?

Please list minimum literacy skills:

-
-
-
-
-

9. Can you think of any barriers that make it difficult for your volunteers, who struggle with reading and writing to engage with further learning that improves their literacy skills?:

10. What kind of numeracy tasks do you expect the volunteers in your brigade to do, calculations such as adding subtraction multiplying?

11. In your opinion, do you think that some of the fire service volunteers in your brigade have difficulties with *numeracy* (e.g. *counting, adding, calculating, etc.*) to the extent that it could compromise essential communication, good operations or safety?

Yes

Sometimes

No

Don't know

10. Could you please briefly describe 3 situations or incidents where the difficulties a volunteer or volunteers had with numeracy, in your opinion, jeopardised essential communication, good operations or safety?

Situation/Incident 1

What action did you take?

Situation/Incident 2

What action did you take?

Situation/Incident 3

What action did you take?

11. How often do you estimate these situations or incidents happened in your brigade during the last year?

1. Never

2. Once or twice

3. 3 to 5 times

4. 5 to 10 times

5. More than 10 times

12. How regularly do you estimate these situations or incidents happen?

1. Never

2. Not regularly

3. Sometimes

4. Fairly regularly

5. Very regularly

13. Where do these situations or incidents happen?

1. During training 2. When preparing for incidents 3. When recording incidents 4. During operations 5. Elsewhere. Please state where

If elsewhere please state where:

14. What types of numeracy difficulties have you noticed some of the volunteers have that compromise essential communication, good operations or safety?

Please list numeracy difficulties e.g. Difficulties counting, adding, calculating, measuring, understanding tables, serious learning difficulties, etc.:

-
-
-
-
-

15. What are the minimum numeracy skills you consider are required for fire service volunteers to be operationally competent and safe?

Please list minimum numeracy skills:

-
-
-
-
-

16. Could you list any barriers you think exist that make it difficult for volunteers who struggle with number skills to improve their numeracy learning in this area?

Please list the barriers to improving learning and skills:

-
-

-

17. In your opinion, do you think there are *other areas of communication* that some of the fire service volunteers have difficulties with to the extent that it could compromise essential communication, good operations or become a safety risk?

Please list any other areas of communication difficulties:

-
-
-
-
-

Thank you very much for your time and for sharing your knowledge and insights.

Appendix Two

Volunteer Fire Brigades Selected by the NZFS for this Research

Auckland:

Huia, Laingholm x2³, Piha x2⁴, Waiatarua.

Canterbury:

Dunsandel, Fairlie, Oxford, Kirwee, Methven, Sheffield.

Southland:

Colac Bay, Gore, Lumsden, Mossburn, Tuatapere, Winton.

Wairarapa:

Eketahuna, Featherston, Martinborough, Woodville.

Wellington:

Titahi Bay, Wainuiomata.

³ NZFS chose two interviewees from the one brigade

⁴ NZFS chose two interviewees from the one brigade