

# MICRONESIAN

JOURNAL OF THE HUMANITIES AND SOCIAL SCIENCES

---

Vol. 3, n° 1-2

December 2004

---

## DESIGN AND APPLICATION OF ON-LINE QUESTIONNAIRES: EXPERIENCES FROM MICRONESIA

Jon G. O'Neill & Dirk H. R. Spennemann  
*Charles Sturt University*

The administration of mail-out questionnaires in Micronesia is plagued by the tyrannies of spatial and cultural distances: Micronesians live dispersed throughout the islands of Micronesia and various locales in the island and mainland USA. They have also been described as people preferring oral exchanges over written communication. While the administration of paper-based questionnaires is challenging, observations of a digital divide in the Pacific make the use of on-line questionnaires a daunting proposition. This paper describes the development of the survey instrument and how it was received by the population surveyed. Advantages and disadvantages of the methodology are discussed.

### INTRODUCTION

Micronesia is located in the northern Pacific Ocean and forms part of Wendt's imagined Oceania. It is a vast area of ocean that stretches over approximately 27 degrees of latitude and 44 degrees of longitude making it about 5,000 kilometers long and 3,000 wide. Despite consisting of almost 1.5 million square kilometers of ocean, there are only about 2,600 square kilometers of land distributed between approximately 2,200 islands. Few of them are more than a hectare or two in size, few are more than two meters above sea level, many have little or no fresh water, and most are uninhabited. Because of their physical isolation, the Micronesian islands were not settled until later in human history. For the same reasons, their first inhabitants were among the last to be affected by European colonialism, and now the nation-states of Micronesia are among the last to gain national independence.

Throughout Micronesia, responsibility for managing the dynamic cultures being constructed by these peoples has traditionally been in the hands of the chiefs. It was one of their particular obligations and responsibilities and could not be ignored (cf. Carucci 1997). Over several hundreds of years in some parts of Micronesia, and over a shorter period in others, colonial powers gradually eroded the authority of traditional forms of government.

During the late twentieth century, the United States National Park Service implemented deliberate policies calculated to slow processes of change within the several cultures of Micronesia and preserve aspects of those cultures. This has continued in conjunction with the Historic Preservation Offices of each of the political entities that have emerged from the Trust Territories of the Pacific Islands, i.e. the Republic of the Marshall Islands, the Federated States of Micronesia, the Republic of Palau and the Commonwealth of the Northern

This is a peer reviewed contribution. *Received:* 19 Nov 2004; *Revised* 15 Dec 2005; *Accepted:* 27 Dec 2004.

© *Micronesian Journal of the Humanities and Social Sciences* ISSN 1449-7336

Letao Publishing, PO Box 3080, Albury NSW, Australia

Marianas; Guam, a former US possession and now a territory, also needs to be mentioned here. In practical terms this has contributed to the development of a preservation ethos that is very similar to that practiced within the United States and other western nations—a conservation ethos that tends to emphasize *tangible* heritage at the expense of *intangible* heritage. Significant resources in terms of time, energy and ‘hard’ money were being used to preserve heritage material in projects that funding sources (almost always external and predominantly from the USA) considered appropriate, such as World War II battlefields and relics, buildings and other constructions (cf. Adams *et al* 1997; Christiansen 1994a–d; Denfeldt 1979a–b; 1981; Hezel & Graham, 1997). Exceptions, outside the realm of straight archaeology, are few (cf. Parker, 1994; Galvan 1998).

The tension between the preservation of WWII period heritage items, which after all are restricted to a very short period of history, and the remainder of the tangible heritage has been explored by Spennemann (1992a–b). During earlier research it was shown that not all Micronesian aspirations or preferences for preservation of their unique cultures and heritage were being satisfied (Spennemann 1992a; O’Neill 2000; O’Neill & Spennemann 2002). Further research was needed to determine Indigenous Micronesian perceptions of heritage preservation—what elements are especially valued, which should be preserved and how they should be preserved, what priorities should be established.

Methods used to collect these data were in-depth interviews with key stakeholders and decision makers, as well as a survey questionnaire that polled both adults and school children. To accommodate the geographical and cultural realities in Micronesia, the questionnaire employed a variety of delivery methodologies. One of these was a computer-mediated survey instrument, an on-line questionnaire

This paper describes the cultural background and conditions which influenced the development of the instrument and discusses the experiences with this questionnaire, in particular the successes and short-comings of delivering such a questionnaire on-line.

## CULTURAL CHALLENGES

Micronesia is not only a collection of islands and atolls that are widely distributed geographically, it is also comprised of many varied and unique cultures. Within each of them, we have to consider the dynamics between national centers and the out-lying districts or islands; dichotomies of power, rank and status; and differences between traditional values and modern commercial realities and influences. Historically, these communities had a culture that was largely non-confrontational and where decision-making processes were strongly based on discussion and achieving consensus. This tradition of consensus and non-confrontation is still strongly entrenched in all of the cultures of Micronesia. Personal opinion is expressed when sought, but rarely volunteered.

Micronesian cultures were also *oral* cultures. Even today, after many decades of acculturation and colonially provided schooling, the emphasis upon written records is far less a part of their cultures than in the ‘western’ world. Thus opinion is provided when prompted in inter-personal communication, such as an interview, but withheld or hesitantly provided via written means.

As these features apply generally across all Micronesian cultures, and much of the Pacific in general, written mail-out questionnaires, which are the standard mode of information gathering in the western world, cannot be considered to be an ideal mode for soliciting information in Micronesia. Indeed, where questionnaires have been used in the Pacific, response rates of mail-out questionnaires have often been very low. A few examples may suffice.

In a mail out targeting Pacific Islander students at a ‘large multi-ethnic, urban polytechnic located in an area of low socio-economic status’ in New Zealand, Rolleston and Anderson (2004) obtained a response rate of only 9%, despite mail-out follow ups. A nutrition survey targeting Pacific Islanders residing in New Zealand showed a response rate of less than 20% (Wham & Worsley 2003). Other studies drawn from a variety of research fields also underscore the lower response rate among Pacific Islanders (Saphira & Glover 2000).

It can be posited, that the response rate should be higher among those sectors that actually manage and use information technology. The reality, however, does not confirm this: A questionnaire sent in 1995 to 137 managers and users of the, then, PAKTOK communications network had a response rate of 24% (Ward & Spennemann 2001). A questionnaire to estimate the number of Pacific Islands people having access to the WWW, sent to 85 individuals in 1999, had a response rate of 48% (Zwimpfer Communications 1999), which is acceptable by any standard. The 2002 repeat survey sent to 161 individuals, however, had a response rate of only 23%, despite 83% of the potential respondents being called personally by phone in a follow-up to the mailing to encourage completion of the questionnaire (Zwimpfer Communications 2002).

Despite these problems, a questionnaire-based approach was seen as the preferred means of data collection, with the inherent problems to be overcome by select means of administering the survey instrument.

### QUESTIONNAIRE DEVELOPMENT

As Gillham (2000) suggests, constructing a questionnaire is easy, but developing one that will produce useful data is a much more difficult task. The process of producing a well-designed and useful questionnaire is “a prolonged and arduous intellectual exercise” and its purpose is “aimed at precision, logic-tightness and efficiency” (Oppenheim (1982, pp. 3-4). Questionnaires have an inherent potential for bi-directional misunderstanding. This is particularly true when complex subjects or issues are involved. As many researchers have noted (see Frazer and Lawley, 2000; Gillham 2000; Brady *et al* 2003) comprehension by participants for whom the questionnaire language is not their primary or preferred language may present difficulties. Similar difficulties may result from cultural differences when questionnaires originate in one culture but are completed by respondents from another culture. This issue may be exacerbated when a variety of different cultures, ethnicities and languages are involved.

Choices and compromises in survey design are unavoidable. For example, what contact and response modes will be utilized? How many questions should there be and how should they be worded? What methodology or combination of methodologies should be used and what levels of technology are appropriate? Should Questionnaires be paper-based and distributed (by mail or by hand), completed and collected manually or can computer-aided features be added? How may people best be encouraged to participate? Should incentives be offered and if so, what kind? Answers to questions such as these must also be evaluated in the light of resources available to the researcher and the nations chosen (cost, time, available technology, geographic distribution, etc).

The option of distributing and collecting questionnaires by mail was discarded for several reasons, including:

- Inequity of opportunity—the geography of the region with islands and atolls (particularly ‘outer’ districts) results in population centers being widely dispersed with frequently irregular and occasionally unreliable transportation between them.
- Expense—Mailing substantial numbers of questionnaires (in excess of 500) to individual participants, having them completed and individually returned by air mail was prohibitive.
- Anticipated Response Times—Postal services within Micronesia and between Micronesia and the outside world are notoriously slow and unreliable: parcels of completed questionnaires took four months (Rota to Australia) and five months (Kwajalein to Australia).
- Promotion—It would have been more difficult to effectively promote the Questionnaire without personal interaction allowing participants to ask questions about the research and its publication.

Completing forms can be problematic for traditionally oral cultures which are not necessarily familiar with the processional, top to bottom, left to right model of information flow that is common in western cultures and which is based on a different cognitive method.

### Internet based questionnaire delivery

The use of the internet as a survey tool has been around since the mid to late 1990s (cf. Carver et al 1998 and references therein). Advantages for internet-based questionnaires include aspects such as social anonymity of the respondents (cf. Joinson 1999). Bowker and Dillman (2000) comment that traditional questionnaires “implicitly assume a cultural mode of cognition in that they rely heavily on the expectation that readers will employ a conventional ‘paper-logic’ while filling out the web survey”. This difficulty is exacerbated when questionnaires are lengthy, involve complex issues, and are written in a foreign language. Other studies, however, have shown that responses between on-line and paper based questionnaire are no different, especially when both are drawn from the same population (in this case self-nominated via the internet) (Ritter et al 2004).

### Areas of questions

Information sought in the questionnaires concentrated particularly on the following three issues:

- 1) How different strata within Micronesian societies (age, education, ‘central’ and ‘outer’ population, ethnicity etc) view heritage preservation and the importance and relevance of their traditional cultures to their societies of today.
- 2) What elements of their heritage Micronesians themselves consider to be most worthy of protection and management.
- 3) Whether the effects of education, empowerment and improved communication on perceptions of heritage values can be measured.

It was deemed desirable to assess these questions by surveying across the strata of age and education. To this end, two base questionnaires were prepared, one targeted to school children in their later years in Primary/Elementary School and the other to High School, College or University students as well as other adults. Both collected data by various strata and the questions comprised multiple-choice and narrative components.

Questions were presented in clear and concise terms using simple English and non-complex expressions. Although multiple-choice questions formed the bulk of the questions (for speed and commonality) opportunities were given at strategic points for respondents to use their own words to express their feelings. The first such opportunity was on the first page of questions so that interest was maintained or generated. From first invitation to the final thank-you the importance of each individuals’ own opinions, values, perceptions and participation were strongly emphasized.

To evaluate comprehension, suitability and time taken to complete them, the questionnaires were pre-tested in Australia with adult and child respondents from non-Indigenous and Indigenous (Aboriginal and Torres Strait Islander) communities. Apart from requiring minor wording changes to several questions, the results of the pre-test indicated that the questionnaires should be easily comprehended and that the average time taken to complete them (approximately 15 minutes) was satisfactory.

### Sample Populations

It was decided to employ direct administration of the questionnaire in ‘captive audience’ situations (class rooms, meetings etc) and a web based questionnaire. Used together, both styles of questionnaire were intended to ensure that most strata of Micronesian society had opportunity to participate in the survey. A significant proportion of the populations of Micronesian nation/states live ‘off-island’ in the United States and elsewhere (Spennemann 2003). Frequently, expatriate Micronesians are significant sources of funds to other family members still in Micronesia, and it can be posited that their opinions will also have considerable influence. Anecdotal evidence suggests Micronesians living overseas are generally more highly educated, have a more ‘western-oriented’ work ethic, and are less concerned with the inherent conflict between economic development and cultural preservation. In some ways this *diaspora* may be regarded as part of a Micronesian educated “elite” and this is sometimes considered to be the case.

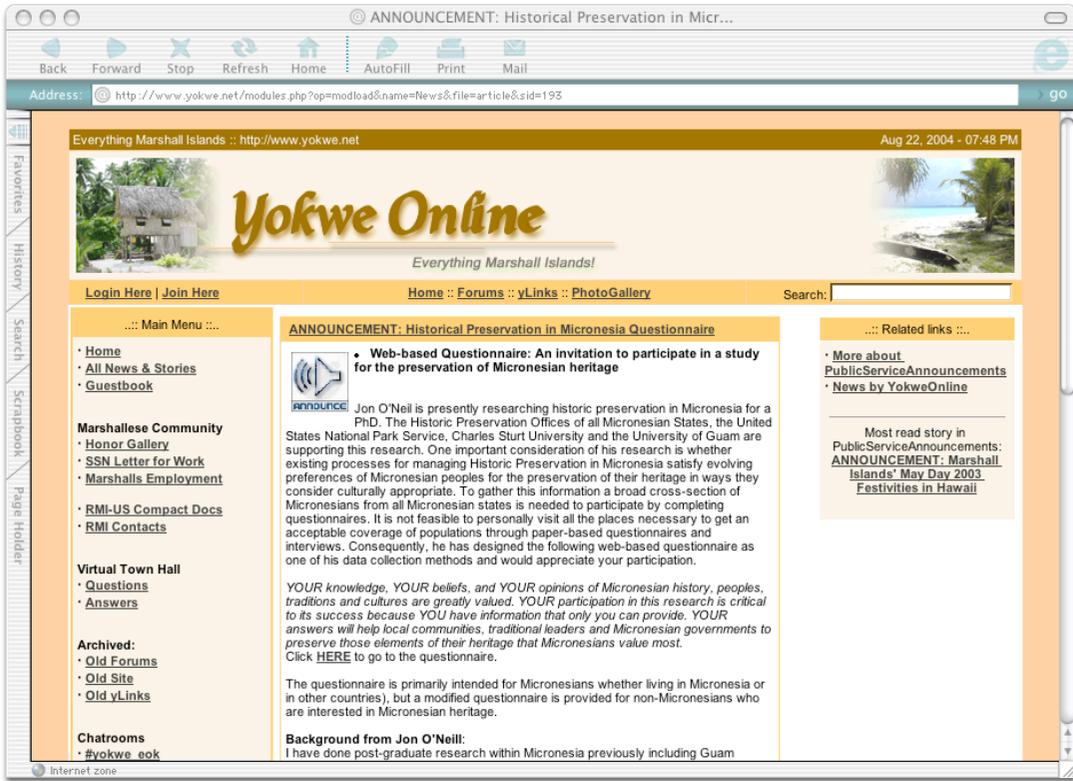


Figure 1. Screenshot of Yokwe.net showing the announcement of the questionnaire

However, such a presumption may be unjustified (at least in terms of heritage preservation), and the questionnaire may provide stronger evidence than exists currently. Certainly, without the Internet-based questionnaire those Micronesians living overseas would not have had opportunity to contribute to the research.

### Promotion

For the paper-based questionnaire, several methods of promotion were adopted including personal contact, conference meetings, meetings with Historic Preservation agencies in the United States and Micronesia, e-mail, telephone conversations, public lectures, guest lectures and presentations at schools, colleges and the University of Guam.

The internet-based questionnaire was advertised by personal contact at conferences, public presentations and lectures, invitations to

participate were distributed by email and 'chat-room' messages, as well as notices being posted on a relevant community Internet portal (figure 1). It was promoted within Micronesian communities with access to the Internet, and completed and submitted electronically. Indigenous Micronesians were the primary target, whether living in Micronesia or elsewhere (such as the United States, Australia or New Zealand), but provision to participate was also made for non-Micronesians who were interested in Micronesian heritage.

### QUESTIONS OF DESIGN

Several issues were recognized as requiring particular care in designing a format for the questionnaires. Both paper-based and web-based questionnaires had to include the same questions so that they were equivalent and data from both could be easily combined and analyzed separately and collectively.

It is important that surveys be structured so that the primary questions are asked early. This encourages respondents to continue because they begin by answering the core material rather than become bored with questions that may not appear to be truly pertinent to the main research (Websurveyor Corporation 2000). Early questions also tend to set the tone for a survey. If not carefully worded, appropriately grouped and well positioned in the questionnaire they can give an unfavorable impression of the research which will probably result in lower response rates. Questions ranged from the regional Micronesian level, through national, state, and home district/island levels to the personal level thus contributing to a sense of personal involvement and ownership of the research.

With that in mind, both questionnaires, paper-based and web-based, were structured in such a way that core questions (those that were more important in terms of the main purpose of the research) were grouped at the beginning and questions that were less important were positioned towards the end. Although the first page contained some demographic questions, they were structured to encourage respondents to develop a personal involvement with the questionnaire by association. Thus the questionnaire began with questions that allowed each respondent to associate with the research through national, ethnic, cultural and 'home-district' linkages. Other demographic questions (usually considered boring or even intrusive) were left to the penultimate group with the final group containing questions relating to the research and the questionnaire itself.

### Structural and Technical Issues

While the paper-based and web-based questionnaires contained the same questions, structural adjustments needed to be made for the web-based questionnaire to function. The remainder of the paper will concentrate

Computer-mediated questionnaires have contributed some issues of concern related to their use of a new medium. Dillman *et al.* (1998) show there are important questions regarding the use of "fancy" or "plain" questionnaires that must be considered before a final

design is established. Questionnaires designed to be 'fancy' generally require greater bandwidth or they are slow to load and thus cause a delay, which may induce the user to abandon the process. They often also require a higher functionality of available IT equipment, and more current software than those designed to be "plain".

One of the most critical early tasks was to clearly define the target audience and the technical capabilities of the service available to them. In the particular circumstances of Micronesia, this included the level of technology to which participants could be reasonably expected to have access and the probable levels of their 'web-literacy'. A report produced by UN-ESCAP (2001) stated, for example, that at that time the IT infrastructure in place in the Federated States of Micronesia was only "average". While 8,000 to 10,000 computers were installed throughout the Federation, only 1,800 were connected to the Internet. Elsewhere, Spennemann (2004a) has outlined the Digital Divides prevalent in the Pacific and has shown that most of Micronesia, with the exception of Guam and the CNMI, suffers from slow connections, high costs and low penetration of IT infrastructure.

Thus, most frequently, the lowest common denominator must become the limiting factor in using such technologies. The Internet-based questionnaire was therefore designed conservatively to permit the widest possible audience participation. Minimal graphics were used as it was important that the speed of loading for each page was as high as possible. Standard HTML (version four) was used exclusively to build the pages and more advanced HTML features such as "style sheets", "linked windows" and "frames" were specifically excluded from the design. To ensure maximum compatibility with the widest possible variety of software and hardware, no proprietary Netscape® or Microsoft® extensions or features were used. The questionnaire could therefore be aptly described as "plain" (Dillman *et al.* 1998).

While respondents to the paper-based questionnaire had the entire questionnaire in front of them, and thus could make a decision

to participate or not, web-based questionnaires are not as clear, which might induce participants to abandon the process half-way through. Couper *et al* (2002) demonstrated that displaying multiple questions on a screen at once rather than singly or as one long questionnaire, reduced completion time, produced fewer non-answered questions and raised levels of consistency in answers. Thus, rather than present the questionnaire as a single monolithic webpage, it was separated into logical sections and presented on-screen one section at a time, with each section containing multiple questions (figure 2). When each page was completed, the answers from that page were posted separately to a receiving directory. A non-identifying code was allocated to each individual access and linked with each questionnaire page completed. This permitted all sections and answers completed to be collected progressively rather than only at the completion of the final page.

A total of fifty-eight separate web pages were prepared and linked to permit a variety of pathways depending on answers to key questions. In this way complications arising from inappropriate, repetitive or unnecessary questions were avoided. The first page displayed consisted of a brief description of the research, an invitation to participate and request for permission to use the information provided. It also included links to other pages containing more detailed descriptions of the research and ethical rules under which this research would be conducted. Respondents were offered the opportunity to accept or decline the invitation to participate in the research. If the invitation was not accepted, a further page was displayed which discussed the importance of participation further and asked respondents to reconsider their decision. If this was accepted then respondents were returned to the Questionnaire and the first question page was displayed. When the questionnaire was completed and the final answers submitted, a special "Thank-you" page was displayed which included instructions for accessing the analyzed data and reports as they became available.

There were seven main pathways:

- Adult Micronesians living in Micronesia
- Adult Micronesians not living in Micronesia
- Adult non-Micronesians
- Elementary School Students attending school in Micronesia
- Elementary School Students attending school outside of Micronesia
- High School Students attending school in Micronesia.
- High School Students attending school outside of Micronesia

From the point of acceptance, respondents were directed to different questionnaire streams depending on their replies to specific key questions (Figure 2). Children attending Elementary school would see four pages consisting of 53 questions, High school students would see seven pages (124 questions), non-Micronesian adults would see seven pages (110 questions), and Micronesian adults would see nine pages (167 questions).

### **Ease of Reading**

The education systems in each of the political entities that have emerged from the former Trust Territory of the Pacific Islands are heavily based on the United States education system. US school curricula are often used to such an extent that American subjects (such as history and geography) are frequently taught at the expense of more culturally relevant local history (pers.obs; Micronesia is not unique in that regard (Spennemann & Meyenn 1997). English is a core subject from an early stage in all Micronesian education programs, but it must be acknowledged that in many instances it is neither the 'first' nor the preferred language. Consequently, questions had to be structured very carefully so they were expressed in as simple a manner as possible and compound questions and jargon were rigorously avoided.

Readability tests are simple techniques for predicting the reading grade level required of average readers that they might understand written material. They can measure the structural difficulty (sentence structure, idea density and vocabulary) of the text of a questionnaire but cannot guarantee its effectiveness (Flesch 1951). The standard Flesch-Kincaid Grade

Level test (which provides an estimate of the U.S. Grade level required for reading a given document) and Flesch Reading Ease tests (both are automated and available in MS Word™) were used to estimate readability of

the Questionnaires. The paper-based questionnaires were tested in their entirety, while each page of the computer-mediated Internet-based questionnaires was tested separately giving a range for each questionnaire (Table 1).

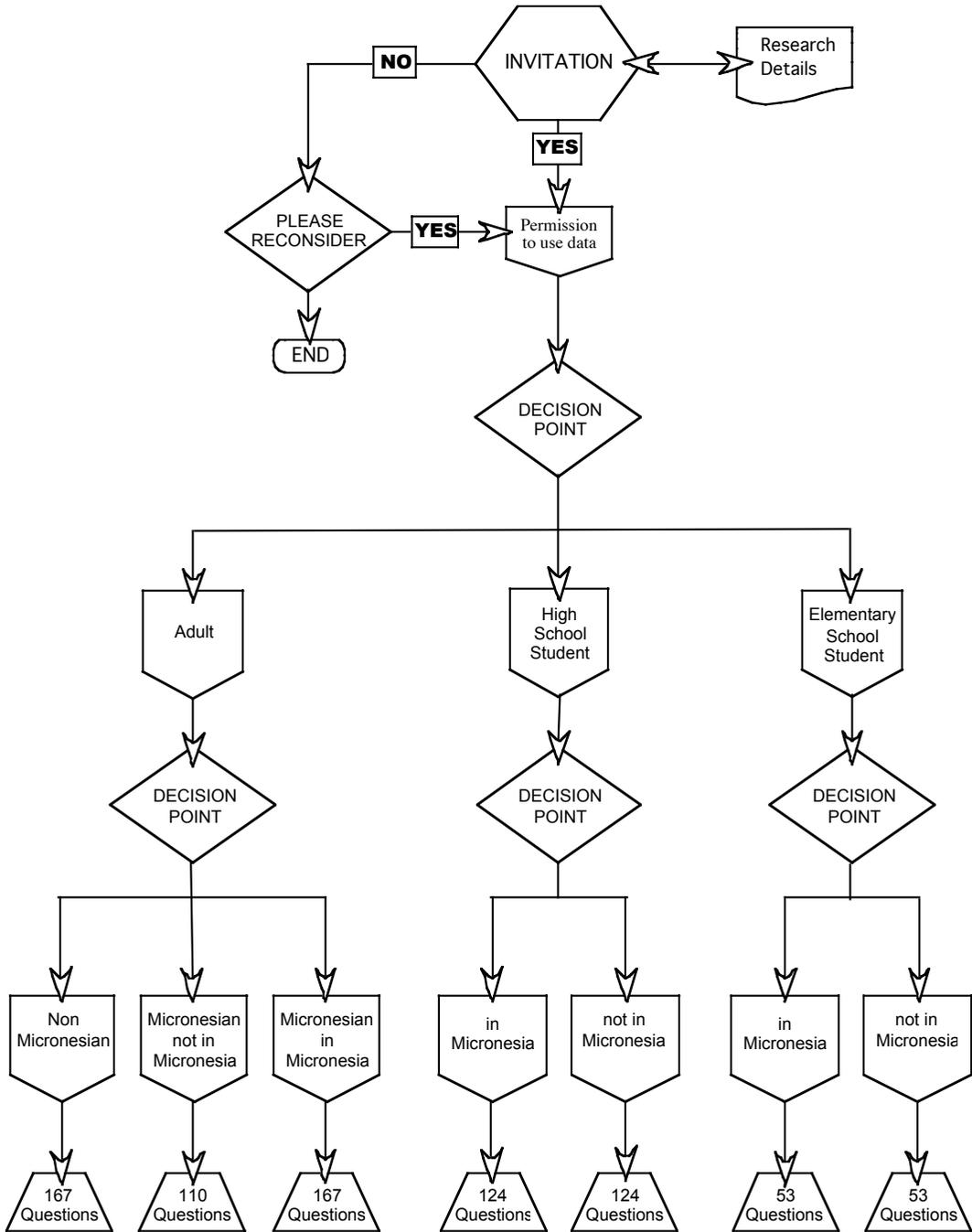


Figure 2. Flowchart of the on-line Questionnaire

Both sets of results indicate that the ‘readability’ of both paper-based and Internet questionnaires are appropriate for their targeted groups. It is considered that a grade-level result of 9 is generally an acceptable level of difficulty for questions posed in a survey to adults. In the Internet questionnaire, two pages of the Adult pathway included a high percentage of statements not written as complete sentences but as a series of responses to a common sentence beginning. Consequently, when standard computer software tests are used to assess their readability they appear to be difficult (Flesch 10.9 and 11.2). To more properly evaluate their readability, the statements were temporarily re-assembled to full sentences and reassessed. When this was done, both pages scored significantly higher on the Flesch Reading Ease scale and lower on the Flesch-Kincaid Grade Level.

Table 1 Ease of Reading

	Flesch-Kincaid Grade Level	Flesch Reading Ease
Paper-Based Questionnaires		
Elementary School students	2.2	90.7
Adults/High School students	8.0	55.8
Computer-Mediated Questionnaires		
Elementary School students	2.3–3.9	79.7–93.9
High School students	4.5–8.8 (11.2)	54.1–79.2 (34.8)
Adults	4.9–8.8	53.7–76.0

**CALCULATING THE RESPONSE RATE**

Although the total number of responses to this Internet questionnaire is not high, the *response rate* has exceeded expectations. In paper-based questionnaires the response rate can be easily measured in terms of questionnaires returned in relation to the total number distributed. The number of responses to an online delivered questionnaire, however, is potentially enormous and, in practical terms, is not readily measurable. While actual responses can be easily totaled, a potential uncertainty remains as to how many people accessed the questionnaire but chose not to respond. To overcome this problem, the design of the online questionnaire purposefully included the already mentioned

introductory page. An analysis of the server log files permits us to quantify the number of people actually accessing this file and thus the questionnaire (to maintain confidentiality, the server log file was analysed by DHRS while the questionnaire response content was analyzed by J O’N; confidentiality is not a concern in this paper as it reports only on process).

The questionnaire went ‘live’ on 29 November 2002 and remained accessible until 24 February 2004. During that period 227 ‘hits’ were recorded on the first or invitation page, a page that described the research, discussed the importance of participation and sought permission to use the information provided. An IP address analysis of these, however, showed that 44 of these were created by web crawler robots operated by various internet search engines (Google, AltaVista and AskJeeves) which had picked up the page reference from the sites linking to the questionnaire. Thus only 183 ‘hits’ were genuine requests for the page. Over 50% of these occurred during the first four weeks (Figure 3).

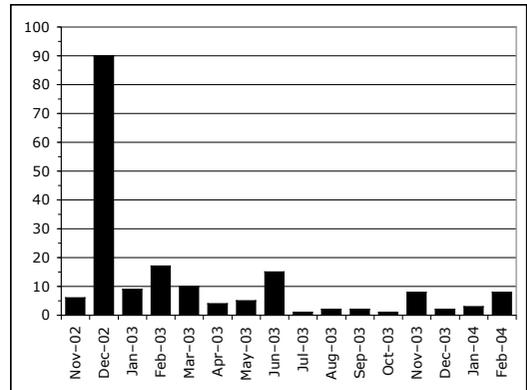


Figure 3. Interest in the Questionnaire November 2002 to February 2004

As the invitation page, as well as subsequent questionnaire pages, required a ‘post’ action by a user (ie. clicking on a button), the search engine robots could not proceed further. Exactly one hundred human participants continued to the next page. The initial response rate was therefore 54.6% percent. Table 2 sets out the flow of respondents through the first seven steps/pages of the questionnaire. As the questionnaires were of differing length, we cannot

compare the retention rate beyond this step. It becomes evident that the percentage of respondents decreases as the questionnaire progressed. Fifty-four respondents completed the questionnaire in one of its configurations. This is a 54% retention rate of those who started and an overall response rate of 29.5%.

Table 2. Flow of respondents through the questionnaire

	n	Percent
View Page	183	100.0
Start Questionnaire	100	54.6
Step 2	97	53.0
Step 3	92	50.3
Step 4	89	48.6
Step 5	72	39.3
Step 6	69	37.7
Step 7	63	34.4
Complete	54	29.5

The computer-mediated questionnaire differs fundamentally from paper based questionnaires in one aspect: not all respondents of paper-based questionnaires who terminate the process before reaching the end actually hand in their incomplete forms, and thus reduce the response rate. The computer-mediated questionnaire, with its incremental completion of the questionnaire components, however, records all responses until that page where respondents actually abandon the process. This results in a differential response rate favoring questions asked early in the questionnaire. If we consider an overall response rate of about 40% as acceptable, for example, then all questions asked up to step 5 are deemed above the cut off, while subsequent pages are below.

**PERCEIVED AND REAL TIME TAKEN TO COMPLETE THE QUESTIONNAIRE**

One of the major concerns in questionnaire design is the time it takes to complete a questionnaire. On-line questionnaires allow to assess the time it takes, as each posting of a completed segment of the questionnaire is recorded in the server logs. It needs to be noted that *elapsed time* does not necessarily equate to the time spent answering the questionnaire but may include time doing other tasks away from the computer. That is, a questionnaire may be started, but abandoned somewhere in the middle, to be picked up and completed at a later

point, while still connected. The same is possible for paper-based questionnaires, but normally undetectable.

The true *elapsed time* taken to complete questionnaires could be calculated for 98 respondents (Table 3). Those who completed the entire questionnaire did so in an average time of 25 minutes and 24 seconds, with the maximum elapsed time being 1 hour 48 minutes and 48 seconds. Not all, however, completed the questionnaire but terminated early. The average time elapsed until completion of the last page before termination allows us to assess the ‘patience’ of those not willing to complete: just under seven minutes. Yet, the maximum of 1 hour 23 minutes and 15 seconds also shows that this has great variation.

Table 3 Elapsed time (h:m:s) to complete/terminate questionnaires

	Average	Stddev	Max	n
Completed	25:24	19:09	1:48:48	54
Terminated	6:58	13:54	1:23:15	44

Despite the fact that elapsed time in four instances was greater than one hour and the longest elapsed time was more than one and three-quarter hours, only seven participants failed to complete the questionnaire after being connected for 15 minutes. Seventy-seven percent of those who did complete it did so in thirty minutes or less.

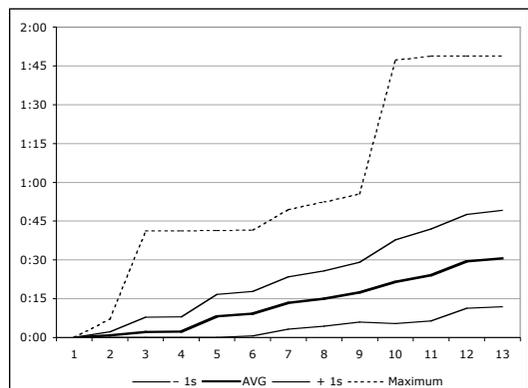


Figure 4. Average cumulative time taken (h:mm) for the completion of consecutive components of the on-line questionnaire.

As expected the average cumulative time taken to complete various steps of the ques-

tionnaires is a linear process (Figure 4). An exception is the curve plotting the maximum time spent, which shows two discrete steps. Suggesting that in that case the questionnaire was temporarily abandoned.

Table 4 Comparison of elapsed time for completed or terminated questionnaires

Time (min)	Completed (%)	Terminated (%)	n
0-5	1.85	70.45	32
6-10	11.11	11.36	11
11-15	22.22	4.55	14
16-30	42.59	9.09	27
30-45	9.26	2.27	6
46-60	7.41	0.00	4
60+	5.56	2.27	4
TOTAL	54	44	98

It is worth observing that of those who failed to complete the questionnaire after commencing it, seventy percent did so within only five minutes of starting (As expected the average cumulative time taken to complete various steps of the questionnaires is a linear process (Figure 4). An exception is the curve plotting the maximum time spent, which shows two discrete steps. Suggesting that in that case the questionnaire was temporarily abandoned.

Table 4). That only 13 (13.5%) chose to terminate *after* five minutes and the fact that no externally derived inducement (such as monetary) was offered to encourage participation strongly suggests that those who completed the second page felt sufficiently motivated to continue regardless of the size and complexity of the questionnaire. Given an opportunity to comment or make suggestions about the research and questionnaire, participants made comments like: “Good survey. I look forward to receiving a copy of the results”, “I will look forward to results of your research”, “I look forward to seeing the results on your web page”, and “I believe this is good thing” (sic). Such comments suggest that participants felt personally involved and developed a sense of ‘connection’ to the research.

Forty-one participants responded to the question “How much time do you think it took to complete this questionnaire?” We can correlate their perception with the actual elapsed time as indicated by the computer logs (Table

5). Overall, 56.1% underestimated the actual time it had taken them, while 26.8% were approximately correct. Only 17.1% overestimated their time investment. This indicates that the respondents were, on average, so engrossed in the questionnaire that they forgot about time.

Table 5 Correlation between perceived and actual time (in minutes) to complete questionnaires

perceived time	Actual Time				Total
	Less than 10	10 to 20	20 to 30	More than 30	
Less than 10	2	5	3	1	11
10 to 20	2	7	6	6	21
20 to 30	0	4	0	2	6
More than 30	0	1	0	2	3
TOTAL	4	17	9	11	41

**ORIGIN OF RESPONDENTS**

One of the major advantages of on-line questionnaires is the relative social anonymity of the respondent (cf Joinson 1999). Thus, while the audience of paper –based questionnaires can be assessed correctly by means of distribution, this is not the case for internet-based questionnaires. Responses can, literally, come from the world over. This can be assessed in two ways: via responses to questions in the survey instrument itself and by an analysis of the computer log files.

The survey instrument asked participants to state their ethnicity as well as their (current) place of residence. The response by ethnicity shows 44.7% of responses came from Micronesians, 32.8% from Americans, 13.8% from Australians and New Zealanders (Table 6).

Table 7 sets out the country of origin of those who called up the initial web page. This captures both actual respondents and interested individuals. Given privacy considerations, the IP addresses were only correlated to country and nature of the IP address by broad category. The US domains dominate the sample by far (78.1%), while truly Micronesian domains are few (3.84). However, the actual physical location of .com domains is no longer predictable as such domains are now marketed worldwide. Thus the actual location of the server was identified using a DNS look-up tool.

Table 6 Adult Internet Responses by Ethnicity and Place of Response

reported place of response

Ethnicity	CNMI	CHUUK	GUAM	KOSRAE	PALAU	POHINPEI	RMI	YAP	HAWAII	USA	AUST	NEW ZEALAND	EUROPE	OTHER
Carolinian			1											
Chamorro	1		1											
Chuukese			1			1								
Kosraean			1											
Marshallese			2	1			2			8	2			4
Palauan										1				
American	1		1				3	1		13				
Australian			3							1	3			
New Zealander												1		
Other					1					1			1	2
Total	2		10	1	1	1	5	1		24	5	1	1	6

Table 7. Origin and category of ISPs connecting to the initial page

Country	Commercial	Government	Military	Organisation	School	University	Total	%
Australia	1		1			4	6	3.28
Austria						1	1	0.55
Canada	2		1				3	1.64
Finland	4						4	2.19
FSM	2						2	1.09
Israel	6						6	3.28
Italy	1						1	0.55
Japan	4			1			5	2.73
Netherlands	1						1	0.55
New Zealand	1					1	2	1.09
Palau	5						5	2.73
United Kingdom						4	4	2.19
USA	93		6	7		2	143	78.14
Total	120		8	7	1	2	183	100.00

Table 8. Geographical Origin of ISPs in the USA connecting to the initial page compared to other parameters

	On-Line Questionnaire		Micronesians US Census 2000		Marshall Islands Digital Library	
	n	%	n	%	n	%
Alaska			359	0.50	133	0.12
Alabama	5	3.7	502	0.70	632	0.57
Arkansas			954	1.34	529	0.48
Arizona	2	1.5	1759	2.47	1343	1.21
California	10	7.4	22077	30.96	12539	11.34
Colorado	43	31.9	1215	1.70	1702	1.54
Connecticut			462	0.65	355	0.32
Washington DC	3	2.2			471	0.43
Delaware					251	0.23
Florida			2177	3.05	6084	5.50
Georgia	3	2.2	1531	2.15	1582	1.43
Hawaii	13	9.6	8399	11.78	9804	8.87
Iowa	1	0.7	245	0.34	438	0.40
Idaho			283	0.40	894	0.81
Illinois			918	1.29	2668	2.41
Indiana	1	0.7	551	0.77	1177	1.06
Kansas			376	0.53	619	0.56
Kentucky			444	0.62	92	0.08
Louisiana			558	0.78	529	0.48
Massachusetts	3	2.2	484	0.68	1122	1.01
Maryland			804	1.13	1195	1.08
Maine					85	0.08
Michigan			771	1.08	2251	2.04
Minnesota			494	0.69	1979	1.79
Missouri	1	0.7	1034	1.45	830	0.75
Mississippi					92	0.08
Montana					117	0.11
North Carolina	1	0.7	1371	1.92	10352	9.36
North Dakota					306	0.28
Nebraska	1	0.7	305	0.43	238	0.22
New Hampshire					112	0.10
New Jersey			636	0.89	1499	1.36
New Mexico			389	0.55	585	0.53
Nevada	1	0.7	1377	1.93	544	0.49
New York	1	0.7	1873	2.63	24442	22.11
Ohio	2	1.5	712	1.00	2604	2.36
Oklahoma			801	1.12	806	0.73
Oregon	2	1.5	2840	3.98	2018	1.83
Pennsylvania	4	3.0	876	1.23	2016	1.82
Rhode Island					253	0.23
South Carolina			482	0.68	717	0.65
South Dakota	1	0.7			422	0.38
Tennessee			713	1.00	818	0.74
Texas	3	2.2	3971	5.57	5397	4.88
Utah			572	0.80	995	0.90
Virginia	4	3.0	1174	1.65	1536	1.39
Vermont					32	0.03
Washington	2	1.5	6278	8.80	2929	2.65
Wisconsin	2	1.5	534	0.75	1710	1.55
West Virginia					72	0.07
Wyoming	1	0.7			57	0.05
Korea (US Mil)	1	0.7				
Guam	16	11.9				
CNMI	1	0.7			4	0.00
FSM	2	1.5			593	0.54
TOTAL	130	100/00	71301	100.00	110547	100.00

In the case of US-based .com domains (51% of the sample), these were further broken down by state. Based on the identified domains, the majority of the respondents came from the USA (41.4%). Only 19% of all responses came from locations in Micronesia, with Guam (17.2%) providing the overwhelming majority. Thus the target audience of the questionnaire, Micronesians living in the Diaspora outside Micronesia was seemingly met.

How does the origin of the people looking up the on-line questionnaire compare to the general population?

Table 8 compares the geographical origin of people living in the USA looking up the initial page; against (i) the distribution of Micronesians in the USA according to the census of 2001; and (ii) the geographical origin of page requests to pages on the Marshalls Islands Digital Library originating from US commercial providers for the period July 2002 to December 2003 (Spennemann 2004b). The responses to the on-line questionnaire bear no correlation to the Micronesian population distribution in the USA ( $r=0.16$ ) or to the audience of the Marshall Islands website ( $r=0.05$ ). The correlation between the distribution of the Micronesian population and the audience of the Marshall Islands website is slightly better, but also not convincing ( $r=0.48$ ).

So, what drives the response? At present we do not know as the return sample is only small. Further research will be required.

## CONCLUSIONS

The question arises, how effective an on-line questionnaire is in a research setting in Micronesia. The questionnaire design was successful in that it resulted in a quite respectable response rate, with a satisfactory overall completion rate of all elements. Where the on-line administered questionnaire under performed was in regard of the total number of questionnaires submitted. That can be explained in terms of the general paucity of internet connections in much of Micronesia as part of the wider digital divide issue (Spennemann 2004a). It is also a factor of limited promotion. Beyond

the initial posting on Yokwe.net and a few newsgroups, there was no avenue for continued promotion of its availability beyond word of mouth. As a result, it seems, the user universe reached was only small.

The small population of responses means that the data collected in the survey are neither representative, nor can they be correlated and compared with the data collected by traditional paper-based questionnaires administered to 'captive' audiences. Future application of the technique in a Micronesian setting will require advance 'advertising' and the development of a 'survey culture' among the Micronesian on-line community.

## BIBLIOGRAPHY

- Adams, W H, Ross, R E, Krause, E L & Spennemann, D H R 1997, *Marshall Islands Archaeology*, Micronesian Resources Study, Micronesian Endowment for Historic Preservation and U.S. National Park Service, San Francisco.
- ASA 2000, *Designing a Questionnaire*, ASA Series - What is a Survey?, American Statistical Association.
- Atrostic, BK, Bates, N, Burt, G & Silberstein, A 2001, 'Nonresponse in U.S. Government Household Surveys: Consistent Measures, Recent Trends, and New Insights', *Journal of Official Statistics*, vol. 17, no. 2, pp. 209-226.
- Baron, J & Siepmann, M 1999, *Techniques for creating and using web questionnaires in research and teaching*, University of Pennsylvania, viewed 10 May 2002, <<http://www.psych.upenn.edu/~baron/examples/baron4.htm>>.
- Bowker, D & Dillman, DA 2000, *An Experimental Evaluation of Left and Right Oriented Screens for Web questionnaires*, Washington State University, Pullman, Washington, viewed 10 May 2002, <<http://survey.sesrc.wsu.edu/dillman/papers/AAPORpaper00.pdf>>.
- Brady, S, Osborn, L, Olson, L & Blumberg, S 2003, 'Questionnaire Design: Issues of language and Culture'.
- Carucci, LM 1988, 'Small Fish in a Big Sea: Geographical Dispersion and Sociopolitical Centralization in the Marshall Islands', in *State and Society: Emergence and Development of Social Hierarchy and Political Centralization*, J Gledhill & B Bender (Eds), Oxbow, Oxford, pp. 33-42.

- Carucci, LM 1997, 'Irooj Ro Ad: Measures of Chiefly Ideology and Practice in the Marshall Islands', in *Chiefs Today: Traditional Pacific Leadership and the Postcolonial State*, GMLL White (Eds), Contemporary Issues in Asia and the Pacific, Stanford University Press, Stanford, California, pp. 197-210.
- Carver, Steve; Kingston, Richard & Turton, Ian (1998) A Review of graphical environments on the World Wide Web as a means of widening public participation in social science research <http://www.ccg.leeds.ac.uk/agocg/report.htm>
- Christiansen, Henrik. 1994a. The Archaeology of World War II in the Marshall Islands. Volume I: Törwa. Republic of the Marshall Islands: Historic Preservation Office.
- Christiansen, Henrik. 1994b. The Archaeology of World War II in the Marshall Islands. Volume II: Wöjjä. Republic of the Marshall Islands: Historic Preservation Office.
- Christiansen, Henrik. 1994c. The Archaeology of World War II in the Marshall Islands. Volume III: Jälwöj. Republic of the Marshall Islands: Historic Preservation Office.
- Christiansen, Henrik. 1994d. The Archaeology of World War II in the Marshall Islands. Volume IV: Mile. Republic of the Marshall Islands: Historic Preservation Office.
- Couper, MP, Traugott, MW & Lamias, MJ 2001, 'Web survey design and administration', *Public Opinion Quarterly*, vol. 65, no. 2, pp. 230-253.
- de Vaus, D A 2002, *Surveys in Social Research*, 5th edn, Social Research Today, Allen & Unwin, Crows Nest, Australia.
- Denfeld, D. Colt 1979a. Field Survey of Ponape: World War II Features. *Micronesian Archaeological Survey Report* No. 2. Saipan: Historic Preservation Office, Trust Territory of the Pacific Islands.
- Denfeld, D. Colt 1979b. Field Survey of Truk: World War II Features. *Micronesian Archaeological Survey Report* No. 6. Saipan: Historic Preservation Office, Trust Territory of the Pacific Islands.
- Denfeld, D. Colt 1981. Japanese fortifications and other military structures in the Central Pacific. *Micronesian Archaeological Survey Report* No. 9. Saipan: Historic Preservation Office, Trust Territory of the Pacific Islands.
- Dillman, D A 2000, *Mail and Internet Surveys: the tailored design method*, 2nd edn, John Wiley & Sons, Inc., New York.
- Dillman, DA, Phelps, G, Tortora, R, Swift, K, Kohrell & Berck, J 2001, *Response rate and measurement differences in mixed mode surveys*, viewed 12 August 2004  
<<http://survey.sesrc.wsu.edu/dillman/papers.htm>>
- Dillman, DA, Redline, CD & Carley-Baxter, LR 1998, The Web Questionnaire Challenge to Survey Methodologists, viewed 10 May 2002, <[http://survey.sesrc.wsu.edu/dillman/zuma\\_paper\\_dillman\\_bowker.pdf](http://survey.sesrc.wsu.edu/dillman/zuma_paper_dillman_bowker.pdf)>.
- Dillman, DA, Tortora, RD & Bowker, D 1998, *Principles for Constructing Web Surveys*, Washington State University, viewed 10 May 2002, <<http://survey.sesrc.wsu.edu/dillman/papers/websurveyppr.pdf>>.
- Dillman, DA, Tortora, RD, Conrard, J & Bowker, D 1998, *Influence of Plain VS. Fancy Design on Response Rates for Web Surveys.*, viewed 10 May 2002, <<http://survey.sesrc.wsu.edu/dillman/papers/sa98ppr.pdf>>.
- DSS Research, I 2000, Complementary Methodologies: Internet versus Mail Surveys, DSS Research, Inc, viewed 9 December 2002, <[http://www.dssresearch.com/resources/PDF\\_Files/mail\\_v\\_internet.PDF](http://www.dssresearch.com/resources/PDF_Files/mail_v_internet.PDF)>.
- Flesch, R *How to test readability*, Harper and Brothers, New York.
- Foddy, W 1993, *Constructing Questions for Interviews and Questionnaires. Theory and Practice in Social research*, Cambridge University Press, Cambridge.
- Frazer, L & Lawley, M 2000, *Questionnaire design & administration*, John Wiley & Sons Australia, Ltd, Brisbane, New York, Chichester, Weinheim, Singapore, Toronto.
- Galvan, J 1998, 'Tangible Spanish Legacy in Micronesia', in *Pacific Islands: The Spanish Legacy*, J Galvan (Ed), Ministry of Education and Culture, Spain, pp. 65-126.
- Gillham, B 2000, *Developing a Questionnaire*, Continuum, London and New York.
- Gunn, H, *Web Based Surveys*, viewed 3 June 2002, <<http://www.accesswave.ca/~hgunn/special/papers/websurv/index.html>>.
- Hager, M, Wilson, S, Pollak, T & Rooney, P nd, Response Rates for Mail Surveys of Nonprofit Organizations: A Review and Empirical Test.
- Harper, B, Slaughter, L & Norman, K, Questionnaire administration via the WWW: A validation & reliability study for a user satisfaction questionnaire, viewed 28 January 2003, <<http://lap.umd.edu/webnet/paper.html>>.
- Hau'ofa, E 1998 'The Ocean in Us', *The Contemporary Pacific: A Journal of Island Affairs*, vol. 10, no. 2, pp. 392-410.

- Hezel, F X & Graham, C 1997, *Truk Underwater Archaeology*, Micronesian Resources Study, Micronesian Endowment for Historic Preservation and U.S. National Park Service, San Francisco.
- Jobber, D 1989, 'An examination of the effects of questionnaire factors on response to an industrial mail survey', *International Journal of Research in Marketing*, no. 6, pp. 129-140.
- Joinson, A. N. (1999). Social Desirability, Anonymity and Internet-based questionnaires. *Behavior Research Methods, Instruments and Computers* 31 (3), pp. 433-438.
- Joinson, A.N., Woodley, A., & Reips, U-R. (in press). Personalization, authentication and self-disclosure in self-administered Internet surveys. In press, *Computers in Human Behavior*.
- Kennedy, JM, Kuh, GD & Carini, R 2000, Web and Mail Surveys: Preliminary Results of Comparisons Based on a Large-Scale Project, viewed 15 July 2002.  
<[http://www.indiana.edu/~csr/AAPOR\\_NSS\\_E.pdf](http://www.indiana.edu/~csr/AAPOR_NSS_E.pdf)>.
- Mangione, TW 1995, *Mail Surveys: Improving the Quality*, Applied Social Research Methods Series, Sage Publications, Thousand Oaks, CA.
- Moore, D S & McCabe, G P 1993, *Introduction to the Practice of Statistics*, 2nd edn, W. H. Freeman and Company, New York.
- O'Neill, JG & Spennemann, DHR 2002 'Colonial Heritage in post-colonial Micronesia', *Pacific Studies*, vol. 25, no. 3.
- O'Neill, Jon Graeme 2000, 'Management of German Colonial Heritage in the Pacific', Charles Sturt University, Albury, NSW, Australia.
- Oppenheim, A N 1982, *Questionnaire Design and Attitude Measurement*, Heinemann Books on Sociology, Heinemann Educational Books Ltd, London.
- Parker, P 1994, Protecting Historic Properties and Cultural Traditions in the Freely Associated States of Micronesia in *Micronesian Resources Study*, United States Department of the Interior, National Park Service, Washington.
- Ritter, Philip; Lorig, Kate; Laurent, Diana & Matthews (2004) Internet Versus Mailed Questionnaires: A Randomized Comparison. *Journal of Medical Internet Research* vol. 6 n° 3, pp.e29
- Rolleston, Anna and Anderson, Helen, (2004) Attrition and retention. The voice of missing students. Australian Vocational Education And Training Research Association. The seventh Australian VET Research Association Conference "Learner & Practitioner - the Heart of the Matter" 17-19 March 2004 Rydges Eaglehawk Resort, Canberra. Paper PA 027.  
<[http://www.avetra.org.au/Conference\\_Archives/2004/documents/PA027Rolleston.PDF](http://www.avetra.org.au/Conference_Archives/2004/documents/PA027Rolleston.PDF)>
- Ronckers, C, Land, C, Hayes, R, Verduijn, P & Leeuwen Van, F 2004, 'Factors Impacting Questionnaire Response in a Dutch Retrospective Cohort Study', *Annals of Epidemiology*, vol. 14, no. 1, pp. 66-72.
- Saphira M.; Glover M. (2000) New Zealand National Lesbian Health Survey. *Journal of the Gay and Lesbian Medical Association*, June 2000, vol. 4, no. 2, pp. 49-56.
- Schonlau, M, Fricker Jr, RD & Elliott, MN 2001, *Conducting Research Surveys via E-mail and the Web*, RAND, viewed 9 December 2002, <<http://www.rand.org/publications/MR/MR1480/>>.
- Sefton, P & Atkinson, J, (2004) *Can an online poll be used as a valid alternative to a traditional paper based survey?*, viewed 2 July 2004  
<<http://ausweb.scu.edu.au/aw04/papers/referreed/sefton/paper.html>>.
- Spennemann, Dirk H.R. (1992a) World War II Remains on Central Pacific Islands: Perceptions of Heritage versus Priorities of Preservation. *The Pacific Review* 5 (3), 1992, 278-290.
- Spennemann, Dirk H.R. (1992b) Apocalypse now?—the fate of World War II sites on the Central Pacific Islands. *Cultural Resources Management* [U.S.National Park Service, Washington] 15(2), 1992, 15-16, 22.
- Spennemann, Dirk H.R. (1993) *Ennaanin Etto - A Collection of Essays on the Marshallese Past*, Historic Preservation Office, Majuro, Republic of the Marshall Islands.
- Spennemann, Dirk H.R. (2003) "Teacher and Student Perceptions of the Cultural Heritage of the CNMI", *Micronesian. Journal of the Humanities and Social Sciences*, vol. 2, no. 1-2, pp. 50-57.
- Spennemann, Dirk H.R. (2004a) Digital Divides in the Pacific Islands. *IT & Society* vol. 1 n° 7, pp. 43-63.
- Spennemann, Dirk H.R. (2004b) A Digital library and archive about the Marshall Islands: experiences and challenges. *Australian Library Journal* vol. 53, n° 3, p. 235-256.
- Spennemann, Dirk H.R. & Meyenn, Robert J. (1997) Cultural Heritage management and Curriculum Development: Some issues facing Melanesian Nations. Johnstone Centre of Parks, Recreation and Heritage Report. 98. Albury, NSW: Charles Sturt University.
- Tun, P 1996, 'Dances, Chants and Songs as Yapese Art Forms' in 5th Pacific Islands Association of Libraries and Archives Conference (PIALA '95):

- Preservation of Culture Through Archives and Libraries, Ed A Cohen.
- Ward, Wesley & Spennemann, Dirk H.R. (2000a). Meeting local needs? a study of a communication project established in the Pacific Islands. *Public Administration and Development* 20(3), pp. 185-195.
- Ward, Wesley & Spennemann, Dirk H.R. (2000b). Getting wired: a Pacific Islands study. *Australian Journal of Communications* 27(3), pp. 91-105.
- Ward, Wesley Stewart 1997, 'A study of reasons why people in the Pacific Islands connected to the Internet', Charles Sturt University, Albury.
- WebSurveyor Corporation 2000, *Survey Design Considerations*, WebSurveyor Corporation, viewed May 2002, <<http://www.websurveyor.com>>.
- WebSurveyor Corporation 2000, *Survey Design Considerations*, WebSurveyor Corporation, viewed May 2002, <<http://www.websurveyor.com>>.
- Wendt, A 1976 'Towards a New Oceania', *Mana Review*, vol. 1, no. 49-60.
- Wham C.A. & Worsley A. (2003) New Zealanders' attitudes to milk: implications for public health. *Public Health Nutrition* 6 (1), pp. 73-78.
- Zwimpfer Communications (1999) Connectedness in Pacific Islands Countries. A survey on the use of computers, e-mail and the Internet in education, culture and communication. Apia: UNESCO Office for the Pacific States <[http://www.unesco.org/webworld/publications/99\\_Internet\\_survey\\_report.rtf](http://www.unesco.org/webworld/publications/99_Internet_survey_report.rtf)>
- Zwimpfer Communications (2002) Internet Infrastructure and e-Governance in Pacific Islands Countries. A Survey on the Development and Use of the Internet. Apia: UNESCO Office for the Pacific States. <[http://www.unesco.org/webworld/publications/2002\\_Internet\\_survey\\_report.rtf](http://www.unesco.org/webworld/publications/2002_Internet_survey_report.rtf)>
- Jon O'Neill, Charles Sturt University, P.O.Box 789, Albury NSW 2640, Australia e-mail [jooneill@csu.edu.au](mailto:jooneill@csu.edu.au)
- Dirk HR Spennemann is Associate Professor in Cultural Heritage Management at Charles Sturt University, Albury, Australia. His main research interests are German colonial heritage in Oceania, in particular Micronesia, and historic preservation issues in Micronesia in general. His second focus re threats to heritage posed by natural and human hazards and threats posed by managers in their efforts to counter these hazards. Ethical Heritage Planning and Policy are the cornerstones that need to be understood and addressed if our past is to have a meaningful future.
- A/Professor Dirk H.R. Spennemann, Charles Sturt University, P.O.Box 789, Albury NSW 2640, Australia e-mail [dspennemann@csu.edu.au](mailto:dspennemann@csu.edu.au)

## **AUTHOR BIOGRAPHIES AND CONTACT**

Jon O'Neill has an Applied Science Degree in Parks, Recreation and Heritage with First Class Honours. He has conducted research in several Micronesian political entities including Guam, Commonwealth of the Northern Mariana Islands, Federated States of Micronesia and the Republic of the Marshall Islands. He is a doctoral student at Charles Sturt University where he is presently researching heritage issues in Micronesia. Particular attention is being given to: changes in preservation management that may have occurred following self-government, evolving Micronesian perceptions of heritage values and the extent to which indigenous decision-makers have been empowered.