

Internet Adoption and Use in the Indonesian Academy:

Issues of Social and Institutional Hierarchy¹

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Abstrak

Biasanya teknologi Internet dianggap sebagai alat teknologi informasi namun artikel ini mengemukakan isu-isu sosial dan budaya yang diadopsi oleh para akademisi di Indonesia. Selain isu-isu biaya, bandwidth, dan infrastruktur, perangkat Internet dibentuk, diperlambat, atau dipercepat oleh kebudayaan institusional serta persepsi teknologi itu. Institusi-institusi akademi di Indonesia, adopsi teknologi Internet bertahan dengan isu-isu pembangunan dan distribusi sosial sumber daya yang terbatas sebagai obyek-obyek status, serta hirarki dalam pengambilan keputusan. Lebih jauh, tulisan ini berpendapat bahwa perhatian terhadap isu-isu adopsi dan penggunaan teknologi internet dalam dunia akademik di Indonesia dapat menyadarkan kita akan isu-isu yang lebih luas tentang interaksi antara teknologi internet dan konteks sosial budayanya di masa depan, seperti halnya terjadi di Asia Tenggara dan wilayah lain.

This paper addresses issues of social and institutional hierarchy in Indonesian academic institutions in relationship to the adoption and use of Internet technology. Based primarily on interviews with Indonesian academics in 1999 and 2001, the paper argues that the adoption and use of the Internet is not only shaped, constrained, or sped along by issues of cost, bandwidth, infrastructure and so on. Issues of insti-

tutional culture and perceptions of the technology that extend beyond its most transparent functional aspects as a tool for communication must be taken into account as well. In the particular case of academic institutions in Indonesia, adoption of Internet technology is intertwined with broader issues of development (and the 'development of underdevelopment'), social distribution of limited resources (e.g. computer terminals and connection points) as status objects, and decision-making hierarchies. While expansion of Internet use is proceeding apace in Indonesia's universities, the paper finds that it is not doing so unmediated by social and cultural contexts. Furthermore, the paper argues that attention to the issues

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raised in early adoption and use of Internet technology in the Indonesian academy can alert us to broader issues of the interaction between Internet technology and its social and cultural context in the future as it becomes more broadly adopted in Indonesia as well as in contexts elsewhere in and beyond Southeast Asia.

My preliminary interest in the use of the Internet in the Indonesian academy began in 1999 while working as a project liaison between the National Bureau of Asian Research, based in Seattle, Washington USA and the Centre for Strategic and International Studies in Jakarta for the development of the 'Access Asia' database (www.accessasia.org) of policy related experts. During two months in Indonesia, I interviewed scholars and technical staff involved in developing Internet infrastructure and related facilities, to learn more about how they accessed the Internet, in order to understand how AccessAsia might better serve as a resource for researchers in Indonesia. The discussion in this paper is based primarily on those interviews, as well as follow-up interviews conducted in August 2001.

In the following sections of this paper, I will first discuss the findings of these interviews and research. I provide an overview of the development and constraints of the infrastructure environment available at Indonesian universities (using the Universitas Indonesia as a primary case) and discuss the end-user experience of the Internet in Indonesia during this period as conveyed in interviews with academics (primarily in the social sciences). Based on this data, I advance two general arguments about the social and cultural aspects of Internet adoption in Indonesia at the end of the twentieth century. First, that institutional hierarchies and the symbolic value assigned to Internet access created an environment in which the Internet operated as much as a prestige item as a communications, networking and research

tool. Second, a gap between the promise and practical experience of the Internet fostered a conscious sense of 'underdevelopment' or lack for many academics in Indonesia—a high-tech, cultural version of 'the development of underdevelopment' (cf. Escobar 1995; Frank 1966).

Internet infrastructure

By the mid-1990s, all major universities and research institutes in Indonesia (at least those of which the author is aware) had undertaken to develop Internet infrastructure for their researchers, staff, and students. The University of Indonesia (UI), along with a few others, was a pioneer in setting up the first academic computer networks based on Internet protocols. In this section I will outline UI's development of Internet facilities. Some aspects of UI are unique (as is the case at every university). For example, technical staff at UI, in charge of developing the university's Internet capabilities, faced unique challenges in light of the movement of the main campus from Salemba (centrally located in Jakarta) to Depok (on the outskirts of the greater Jakarta metropolitan area). More generally, they have faced resource and fiscal constraints as well as competition from private Internet providers. But interviews at various universities indicate that the general experiences of UI are common to many other institutions in Indonesia.

The University of Indonesia has had Internet connectivity since 1993 with the development of the country's first ISP network, known as 'IPTEKNET,' which connected the Salemba campus to the wider Internet. Early users found the basic telecommunications infrastructure (e.g. telephone lines) to be highly problematic for Internet connectivity; due to narrow bandwidth and poor quality (interference resulting in lost data and disconnections). In 2001, this network—IPTEKNET—was still in use with a (relatively low) bandwidth of 64

Kbps (Kilobits per second). But IPTEKNET had become a 'backup' system for email only. It was supplanted by a 2 Mbps (Megabits per second) wireless connection between the Depok campus and Indonesia Telkom. In addition, a 2 Mbps microwave connection was installed between the Depok and Salemba campuses. UI chose to develop wireless and microwave connections because of inadequacies with the available wired infrastructure. However, problems remain, for example with weather conditions occasionally interfering with the microwave connection between the two campuses.

As of mid-2001, UI had yet to expand its Internet services to all levels and all staff and students at the university. Out of a total population of 35,000 staff and students, UI had 3,000 users (by number of accounts). Of this, fewer than 400 were academic staff, the majority of the remaining 2500+ users were students. The number of user accounts grew rapidly in the mid-1990s when internet services were first made available, but has remained relatively stable over the past 2 years. One of the limiting factors is that students are required to pay a fee for the services of Rp60,000 (or about US\$6.00 at 2001 exchange rates) per semester. The fees do not substantially cover costs of Internet facilities; rather, the purpose of the fees is to prevent 'inappropriate' use. Computing center staff expressed a concern that if Internet service were provided automatically to students, the students would be more likely to misuse the service. Although the fee seems minimal (but not insubstantial, in terms of student budgets in Indonesia), it does dissuade some students from using the UI facilities. More importantly, the establishment of accounts is not automatic; students and staff must actively apply for an account, and many do not bother to do so.

The UI computer center also competes with private providers both on and off campus. Dozens of small 'Internet cafés' providing connectivity at hourly or half-hourly rates are located near the Depok campus. In addition, a private company 'M-Web,' has established Internet services on the campus itself. M-Web has permission to make arrangements directly with various faculties of the university to establish computer and Internet facilities located at sites around the campus. These services are used mainly by students, but occasionally by faculty as well. The official UI Internet service provider thus faces a combination of limited resources and funding as well as competition from private providers located in close proximity to the users or potential users of UI Internet services.

Another limiting factor is an inadequate number of workstations (computers) for students and also staff to use. UI is moving toward providing every academic staff member with a computer equipped with Internet connectivity. Until recently, however, a ratio of between 2:1 to 4:1 of computer to academic staff was common (and still is at many Indonesian universities).

While UI and other universities in Indonesia have made efforts, given various (especially economic) constraints, to develop Internet connectivity for their academic communities, this has not had the same high-profile importance that it has elsewhere (e.g. the United States, Singapore, Malaysia). Indonesia was also severely affected by the 1997-1998 Asian financial crisis and its fall-out. The country has been preoccupied with a tumultuous transition to democracy, social upheaval and general political and economic uncertainty over the past 5 or more years. Not only did Indonesia begin the 'Information age' (if we count that as beginning in the late-1980s or early-1990s, with

the global expansion of the Internet in particular) with fewer economic resources and less specialized expertise for developing IT capacity; the past half-decade in particular has not seen a climate conducive to rapid expansion of that capacity. According to available World Bank statistics, Indonesia was the only ASEAN country to see an absolute decline in expenditures on Information and Communication Technology (ICT) between 1995 and 2001 (see Table 1).

Information available to the author also indicates that UI's experience is not unusual among academic institutions in Indonesia. While some private universities are better funded than a state institution like UI, most seem to have similarly limited Internet capacity (of course, this can change relatively rapidly, as has been seen in the rapid expansion of the Internet, in less than a decade, elsewhere in the world). Administrative and technical staff at almost all universities and research institutions that I spoke to in 1999 and 2001 indicated that they had plans for significant expansion of access to the Internet (in terms of terminals and bandwidth) for their staff and students, but they also frequently indicated that the realization of such schemes was almost always slow in coming or behind schedule.

Internet use among academics and researchers

Due to the nature of my work and contacts in Indonesia in 1999, when I conducted the majority of interviews discussed here, those I interviewed are not a statistically random sample of all Indonesian academics, nor of any pre-existing segment of that community. Rather, they are individuals whom I met in the course of developing the AccessAsia database, via the Centre for Strategic and International Studies. They are primarily senior rather than junior researchers, mainly in the social sciences

(though my discussion and argument below is also based on the experience of a wider range of formal and informal interactions with academics in Indonesia, both in 1999 and 2001, many of whom were younger, junior researchers). My data, a preliminary selection of which is found in Table 2, are suggestive of certain aspects of academic end-user experience. (A broader survey of academic use is currently in process.)

The 23 academics whom I interviewed in 1999 regarding their Internet use were based at a variety of universities (14 individuals), non-governmental research institutes (5 individuals) and government research institutes (4 individuals).² All were at institutions in Java, although I traveled to locations throughout the island (see Table 2 for locations). While some individuals reported (or at least were of the opinion) that Internet access was not as good outside of major cities such as Jakarta, in 1999 there was at least some level of Internet access available in all the locations I visited. And, problems with access (poor telephone lines, for example), were often as likely to be a problem in the infrastructure of major cities like Jakarta or Surabaya as they were to be in smaller, more 'remote' towns such as Salatiga.

Among those I interviewed, all but two had at least one email address, and only those two reported not using the Internet in any fashion. However, a significant number of the senior researchers and administrators reported never checking their own email but rather having staff

² Almost all of these individuals had some experience as a teacher/researcher in Indonesian universities. Many of those at research institutions, especially non-governmental, had previously been academic staff at a university. Several of those whose main affiliation was a non-university research institute also taught at least part-time at one or more universities, or, as in one case, were 'on-loan' from a university department to a government research unit.

(e.g. secretaries or research assistants) check it for them. Their experience of email, therefore, was very much like that of regular mail. Rather than directly 'interfacing' with the computer, these individuals would have their staff screen all their email, print out hard copies of important messages, and take dictation on responses. So, while these researchers and administrators 'used' email and had email addresses, their use of Internet communication technology closely modeled postal communication, only slightly faster.

Fewer academics used the World Wide Web (WWW) (14 of 23 vs. 21 of 23) than used email. For some senior researchers and administrators, this use was also mediated by junior staff and assistants (i.e. they would view articles or web pages downloaded by junior staff rather than do a great deal of 'web-browsing' themselves). Senior academics, as might be predicted, generally used the WWW less than their junior counterparts: While less than 30% of the senior academics interviewed used the WWW on a daily basis, and only about half used it with any regularity at all, the junior researchers interviewed all used the WWW on a daily basis.³

Internet adoption and institutional hierarchy

The first computer protocols for email communication were developed in 1971 in the United States (Dodge and Kitchin 2001:155). The now familiar story is that this form of communication spread slowly in the 1970s and 1980s, primarily among computer specialists in

³ To reiterate, the numbers and sampling here only allow for 'suggestive' analysis, rather than statistical certainty; however, this does correspond not only to what we might expect (younger researchers adopting the technology more rapidly), but also to sentiments expressed in interviews and in additional conversations not contained in the data table.

North America and Europe, and then more widely among academics in scientific and later other disciplines. This spread of email use as well as other forms of information exchange (based for example on ftp and http), followed what we could call a 'bottom-up' pattern. It gained popularity among a relatively small group of specialists and enthusiasts long before coming to the attention of the general population or even, for that matter, other members of the academic community. Email was well established in these specialist communities by the time (in the late 1980s) its use began to spread more widely and then explode in the 1990s.

This was a particular history of email and (more generally) Internet adoption in North America (and perhaps also Europe). The first adopters were academics and 'computer geeks' and its spread was predicated on the (at first) slow, but exponential networking of computers in an ever expanding grid. Non-specialists saw email (in the 1980s and even early 1990s, before the development and popularization of the http-based World Wide Web) as something of a novelty. It was a means to connect with a small number of others who were also connected, at a very low cost (if one was at an academic institution with access to public or university provided computer terminals).

Cultural constructions of the Internet have a bearing on its adoption as a tool for networking and information exchange. The particularity of Internet adoption at academic institutions in Southeast Asia contrasts in important ways to the history of the Internet in North America. In Indonesia, adoption of Internet technology among academics has been subject to local contexts and values. It has also been subject to the global 'buzz' about the Internet already apparent by the early 1990s when the Internet was first being introduced to Indonesia. The most important values at play revolve around

concepts of development and prestige. Rather than coming from the 'bottom-up,' Internet adoption was a 'top-down' phenomenon.

Early adoption of the Internet in Indonesia was a case of limited access to a high prestige item. Up until the very late 1990s (and generally still, with a few exceptions), Indonesian universities did not have the resources to provide computer terminals, connection points or even individual email addresses to all staff in the academic community (let alone students). The distribution of these limited resources was based on academic status within institutions. Thus, computers, connection points and email addresses were distributed first to university presidents and provosts, deans, department heads, and so on down the line (with some exception for schools of computer science, etc.). As mentioned earlier, many universities in Indonesia as of 2001 still had 2:1 or even 4:1 ratios of academic staff to Internet-connected computer terminals.

Email addresses were symbolic prestige items as much if not more than functional tools of communication. Individuals of note—heads of departments, provosts, and others were allocated email accounts. For others, in many departments or sections of the Indonesian universities, email addresses were assigned on a departmental rather than individual basis. As noted above, many high-ranking academic staff used email only in the sense that their subordinates (administrative staff) would read email for them, print it out if important for them to read and then key in dictated replies on their behalf. Thus, email was used as a rapid mail delivery system, as more a print rather than digital medium.

This hierarchy is also reflected in Indonesian universities 'web presence.' In March 2002, an extensive search (of up to an hour or more, per site) of the websites of three leading Indonesian Universities failed to locate email ad-

resses for any individual faculty members in the Social Sciences.⁴ These websites listed only general departmental addresses or addresses for individuals in leadership roles (deans, department heads, etc.). University of Indonesia and Universitas Surabaya websites listed faculty members and the degrees they held, but no email addresses (or other contact information, such as phone numbers). The Universitas Gadjah Mada website provided only general information about programs of study, but none about academic staff. In the course of browsing for information on over a dozen university websites, email addresses for individual staff were found at only one university (Atma Jaya).

The adoption and expansion of Internet access and resources in the framework of these institutional hierarchies appears to have resulted in an odd 'digital divide' within institutions. Interviews indicate that those with the best access to the medium were often (though by no means always) the least likely to feel comfortable with it (being of an older generation of scholars not trained in the 'Information age'). At the same time, younger scholars, often with some experience using email as a means of communication, had less access to it. Several (mostly younger scholars) also expressed frustration that expansion of Internet facilities was not given the priority they felt it deserved because the decision makers (the older generation) did not see the need for expanding the facilities (both because they had access and because they did not use the access they had to its full potential).

⁴ This search focused primarily on the websites of Universitas Indonesia, Universitas Gadjah Mada (UGM) and Universitas Surabaya (Ubaya), but attempts were made to find similar information on other university webpages as well.

(Virtual) development of (virtual) underdevelopment

Despite limitations to access, almost all academics I interviewed and spoke to had some experience with using email or Web browsing. Among those I interviewed, only one respondent had consciously refused to use the Internet in any capacity. His impression of the Internet was that it constituted one more form of Western postcolonial imperialism structuring the lives of Asians—view that he held with a great deal of passion.⁵ While his reaction to the Internet was extreme, he was far from alone in having misgivings about the medium.

Nearly all of those I interviewed felt the Internet was or could be of great benefit to them, both as a tool for networking and for finding information. Indonesian academics were quick to identify the Internet as a potential medium for overcoming inadequate library facilities and a source of data useful to their own research (the latter being more common in some fields, e.g. Economics, than in others such as History or Anthropology). However, Indonesian scholars sometimes found it necessary to go to great lengths to utilize the Internet's potential. Researchers searching for and downloading articles and other sources of information from the World Wide Web reported that they generally had to go out of their way to do so. Because of limitations on bandwidth, Internet traffic slowed to a crawl during office hours, particularly from about 10 am to 5 pm, when the most people were online. In order to search the web with any efficiency and to access publications and materials available, many academics reported coming in early in the morning, staying late at night or working on the weekends. A few dedicated souls did this on a regular basis, while others did it less regularly.

Many more had tried but generally given up in frustration after a few attempts; they no longer used the web for research purposes. Bandwidth and speed problems affected their ability to use the WWW for research, not only because of the frustration of slow downloads (researchers reported spending up to 30 minutes downloading a medium length article in some cases), but also because of frustration with disconnections, which meant losing downloads after the computer had been working at it for as many as five, ten or more minutes.

An additional problem reported by several scholars related to inadequate software and technical support. Less tech-savvy researchers were at a loss as to how to open certain articles (files) that they found on the web. Most often this related to files in .pdf format, commonly opened with Adobe's 'Acrobat Reader.' While some scholars had downloaded the Acrobat Reader (which is available as free shareware), many were not familiar with it; nor was it automatically installed on computers provide by their institutions. Tech-savvy researchers also knew of programs which allowed files to be recovered and completed in the case of partial downloads (thus overcoming the disconnection problem). But again, such programs, although available as free shareware, were not generally known or used by academics in Indonesia.

In many places in the world (e.g. North America, Europe, Singapore), the Internet has become a seemingly indispensable tool to academic researchers, so much so that some (perhaps especially younger) scholars ponder how papers were written, conferences organized, funding located, and jobs found just some 15 or even 10 years ago, before email was wide spread and before the WWW even existed. The worldwide hype about the web has made academics in Indonesia very aware of this medium. However, the Internet as a functioning tool has

⁵ He is not entirely alone in this interpretation of the Internet, see Loo and Beng (1998).

yet to become as wide spread, easily available, and institutionalized (e.g. in its use for intra-institutional communication) as the awareness. Administrators and technical staff draw up proposals, design projects, and lay infrastructure, sensing a need (if sometimes feeling a bit uncertain as to why) to make Internet capability available at Indonesian institutions. Yet they are often limited by economic, technical and (as I have focused on here) social and institutional factors from turning grand plans into working realities. The result is often a felt experience of frustration and sense of being on the wrong side of a growing 'digital divide.'⁶

Conclusions

Among policy makers and technicians, as well as in the interviews and discussions on which this paper is based, economic and technical issues are usually the factors most prominent in addressing Internet adoption, expansion, and use. Only secondarily (though increasingly) is consideration given to the cultural and social aspects of the Internet. When cultural and social issues are addressed, they seem most frequently to be related to subjects such as identity, norms, or ethics in Internet-mediated interaction (e.g. Kolko, Nakamura and Rodman, 2000; Jones 1995, 1997; Lozada 1998; Mee 1998; Mitra 1997; Nyce and Stahlke 1996; Sardar and Ravetz 1996; Smith and Kollock 1999; Suler 1996; Woolley 1992; Wu 1999). These are by no means unimportant issues, but in this paper, I have suggested another important aspect of the cultural and social interface between us and our technologies. That is how Internet technology operates in a broader, although still particular, field of social values, symbols, and hierarchies. This opera-

tion effects the adoption, use and access to the Internet itself and the social and cultural field within which it becomes enmeshed and embedded (cf. Bunnell 2002; Castells 1996 1998; Hakken 1999; Koku, Nazer and Wellman 2000; Slevin 2000; Wilson 1998). As outlined above, Internet adoption in Indonesian academic institutions has been shaped by its introduction itself having a particular symbolic value, as prestige associated with 'Internet hype'. Great expectations combined with uneven distribution, and frustrations at slow downloads, broken connections, or inadequate facilities make the Internet now a visible sign not only of a digital but also of economic and socio-political divides as well.

As just about anyone who has used the Internet and computers over the past decade has learned, the Information Age is by no means a static one. The empirical situation in Indonesia discussed here may well be a fleeting one of the last years of the 20th century. Despite some of the limitations and frustrations outlined in these pages, there is certainly no shortage of research and networking being carried out via the Internet among Indonesian academics and their interlocutors (the conference at which this article was first presented being a prime example). It is hoped, however, that this paper will not only contribute to understanding of the particular issues of the period to which it refers, but also to consideration of the broader issue of the interface between communication technologies and the social and cultural fields within which they develop.

⁶ This phenomenon and the potential for it have been examined and posited by, among others Manuel Castells (1996; 1998) and Pippa Norris (2001).

References

- Bunnell, T.
2002 '(Re)positioning Malaysia: High-tech Networks and the Multicultural Rescripting of National Identity.' *Political Geography* 21:105-124.
- Castells, M.
1996 *The Rise of the Network Society (The Information Age: Economy, Society and Culture Volume 1)*. Oxford: Blackwell.
1998 *End of Millennium (The Information Age: Economy, Society and Culture Volume 3)*. Oxford: Blackwell.
- Dodge, M. and R. Kitchin.
2001 *Atlas of Cyberspace*. Edinburgh Gate and London: Pearson Education Ltd.
- Escobar, A.
1995 *Encountering Development: The Making and Unmaking of the Third World*. Princeton: Princeton University Press.
- Frank, A.G.
1966 'The Development of Underdevelopment' *Monthly Review* 18(4):17-31.
- Hakken, D.
1999 *Cyborgs@Cyberspace?: An Ethnographer Looks to the Future*. New York and London: Routledge.
- Koku, E., N. Nazer, and B. Wellman.
2001 'Netting Scholars: Online and Offline' *American Behavioral Scientist* 43(10):1752-1774.
- Kolko, B.E., L. Nakamura and G.B. Rodman (eds.)
2000 *Race in Cyberspace*. New York and London: Routledge.
- Johnson, S.
1997 *Interface Culture: How New Technology Transforms the Way We Create and Communicate*. New York: Basic Books.
- Jones, S.G.
1995 *Cybersociety: Computer-Mediated Communication and Community*. Thousand Oaks (CA): Sage.
- Jones, S.G.(ed.)
1997 *Virtual Culture: Identity and Communication in Cybersociety*. Thousand Oaks (CA): Sage Publications.
- Loo, E. and Y.S. Beng
1998 'Cyber-Colonialism in Asia: More Imagined than Real?' *Media Asia* 25(3):130-137.
- Lozada, E.P., Jr.
1998 'A Hakka Community in Cyberspace: Diasporic Ethnicity and the Internet.' In S.C.H. Cheung (ed.) *On the South China Track: Perspectives on Anthropological Research and Teaching*. Hong Kong: Hong Kong Institute of Asia-Pacific Studies, Chinese University of Hong Kong. Pp.149-182
- Mee, W.
1998 'National Difference and Global Citizenship.' In J.Kahn (ed.) *Southeast Asian Identities: Culture and the Politics of Representation in Indonesia, Malaysia, Singapore, and Thailand*. Singapore and London: Institute of Southeast Asian Studies.
- Mitra, A.
1997 'Virtual Commonality: Looking for India on the Internet.' In S.G.Jones (ed.) *Virtual Culture: Identity and Communication in Cybersociety*, edited by. Thousand Oaks (CA): Sage Publications.
- Norris, P.
2001 *Digital Divide: Civic Engagement, Information Poverty, and the Internet Worldwide*. London and New York: Cambridge University.
- Nyce, J. and H. Stahlke.
1996 'Belief, Community, and Technology on the Internet' *Practicing Anthropology* 18(2):33-35.
- Sardar, Z. and J.R. Ravetz (eds)
1996 *Cyberfutures: Culture and Politics on the Information Superhighway*. New York: New York University Press.
- Slevin, J.
2000 *The Internet and Society*. Cambridge: Polity Press.
- Slouka, M.
1995 *War of the Worlds: Cyberspace and the High-Tech Assault on Reality*. New York: Basic Books.
- Smith, M.A. and P. Kollock (eds)
1999 *Communities in Cyberspace*. London and New York: Routledge.
- Suler, J.
1996 *The Psychology of Cyberspace*. <http://www.rider.edu/~suler/psycyber/psycyber.html>.
- Turkle, S.
1995 *Life on the Screen: Identity in the Age of the Internet*. New York: Simon & Schuster.
- Wilson, E. J.
1998 'Inventing the Global Information Future' *Futures* 30(1):23-42.
- Woolley, B.
1992 *Virtual Worlds: A Journey into Hyped Hyperreality*. Oxford: Blackwell.

World Bank

2001 'GNI per capita 2001, Atlas method and PPP'. <http://www.worldbank.org/data/databytopic/GNPPC.pdf>

Wu, W.

1999 'Cyberspace and Cultural Identity: A Case Study of Cybercommunity of Chinese Students in the United States.' In M.H. Prosser and K.S. Sitaram (eds) *Civic Discourse: Intercultural, International, and Global Media*. Stamford (CN): Ablex.

Table 1: ASEAN Countries' ICT Expenditures, 1995/2001

Country	Total ICT \$, millions 1995	Total ICT \$, millions 2001	ICT as % of GDP 1995	ICT as % of GDP 2001	ICT per capita (\$) 1995	ICT per capita (\$) 2001
Singapore	5,735	9,592	6.9	9.9	1,920	2,110
Malaysia	4,438	6,325	5.0	6.6	221	262
Thailand	4,464	4,751	2.7	3.7	75	76
Indonesia	4,337	3,540	2.1	2.2	22	17
Philippines	1,933	3,131	2.6	4.2	28	41
Vietnam	740	2,124	3.6	6.7	10	26

Source: World Bank <http://www.worldbank.org/data/countrydata/ictglance.htm>
(Note: No data available for Brunei, Cambodia, Laos, and Myanmar)

Table 2: Selected Data from Interviews with Indonesian Academics, 1999

#	Position	Institution	Location	Email Address	Email Frequency	Use WWW?	WWW Freq.	Access Locations
1	Dean	University	Bandung	Yes	Daily	Yes	Daily	Office Only
2	Dean	University	Salatiga	Yes	Staff checks	No		None
3	Dean	University	Semarang	Yes	Daily	Yes	2-3x/week	Office Only
4	Researcher, Admin	University	Bandung	Yes	2-3x/week	No		Office Only
5	Researcher, Admin	University	Bandung	No	N/A	No		None
6	Researcher, Admin	University	Bogor	Yes	Staff checks	No		Office Only
7	Researcher, Admin	University	Jakarta	Yes	Daily	Yes	2-3x/week	Office & Home
8	Researcher, Admin	University	Mabng	Yes	Daily	Yes	Daily	Office & Home
9	Senior Researcher	University	Bogor	No	N/A	No		None
10	Senior Researcher	NG Inst.	Bogor	Yes	Daily	Yes	Daily	Office Only
11	Senior Researcher	NG Inst.	Jakarta	Yes	Daily	Yes	Daily	Office & Home
12	Senior Researcher	NG Inst.	Jakarta	Yes	2-3x/week	Yes	2-3x/week	Office & Home
13	Senior Researcher	Gov Inst.	Jakarta	Yes	Staff checks	No		None
14	Senior Researcher	Gov Inst.	Jakarta	Yes	2-3x/week	Yes	2-3x/mon.	Home Only
15	Senior Researcher	Gov Inst.	Jakarta	Yes	Daily	No		Office Only
16	Senior Researcher	NG Inst.	Jakarta	Yes	Staff checks	No		Office Only
17	Senior Researcher	Gov Inst.	Jakarta	Yes	Daily	Yes	Daily	Office Only
18	Senior Researcher	University	Saktiga	Yes	Daily	Yes	Daily	Office & Home
19	Senior Researcher	University	Surabaya	Yes	Staff checks	No		Office Only
20	Junior Researcher	University	Bandung	Yes	Daily	Yes	Daily	Office & Home
21	Junior Researcher	NG Inst.	Jakarta	Yes	Daily	Yes	Daily	Office Only
22	Junior Researcher	University	Surabaya	Yes	Daily	Yes	Daily	Office Only
23	Junior Researcher	University	Surabaya	Yes	Daily	Yes	Daily	Office Only

Key to Abbreviations: Dean = Dean or other Senior Administrative Position; Researcher, Admin = A senior researcher with significant administrative duties (e.g. head or deputy head of a department); Senior Researcher = Researcher with more than 10 years experience in an academic or research position; Junior Researcher = Researcher with less than 10 years experience; NG Inst. = Independent Non-governmental Research Institution; Gov. Inst. = Government Research Institution; Use WWW? = Use of Web Browser; Access Locations = Location or locations where this individual reports having access to the Internet.