



Internet's impact on expert–citizen interactions in public policymaking—A meta analysis

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ABSTRACT

This article studies the internet's impact on expert–citizen interactions in the process of public policymaking. It examines a possible solution to a classical democratic dilemma of citizens' *right* to participate versus citizens' *ability* to participate. Through a meta-analysis of the past studies on internet's impact on citizen participation in public policy making, the authors find that the internet has successfully reduced resource difference between policy experts and the citizens as promised. However, the technology itself does not provide all the answers. Exogenous factors such as personal characteristics, decision environment, and institutional factors all play a role in enhancing the impact of the internet. Continued education and institutional innovations are necessary to encourage citizen–expert collaboration and reduce resource difference between the citizens and policy experts. Also, more clearly defined and systematic theoretical and empirical studies are needed to help facilitate our understanding of efficient citizen–expert interactions in public policy making by way of the internet technology.¹

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1. Introduction: can new technology resolve our old dilemma?

Democratic public policy making has always been a challenging political process due to the tension between citizens' right to participate and citizens' ability to participate. Increasingly in our modern world, the complexity of the modern society, as well as the complexity of policy problems, calls for expertise in policy making and implementation. Expert-driven policy making is becoming as important an element in the policy process as democratic participation. As a result, the tension between experts² and citizens—or more generally, between professional expertise and democratic governance—has also increased (Eden, 1996; Fischer, 2000, p. ix). Researchers argue that in the new century, one of the basic sources of social and political conflict is the very division between those with and without expert knowledge (Fischer, 2000, p. ix).

In spite of the enthusiastic call for more citizen participation on the part of its advocates, there is a “disturbing decline of democratic practices” (p. x, *ibid*). Doble and Richardson (1992) portrayed this reality as a policy dilemma: the difficulty to legitimately deny citizens participation in decision-making in a democracy although they may not have enough knowledge to participate meaningfully in some

technically oriented policy decisions (p. x). The advent of information technology has brought new hope. Cleveland (1985) observed that the characteristics of information as a new and different resource—such as expandable, not resource-hungry, substitutable, transportable, diffusive, and sharable, in an information society—can weaken the impact of the hierarchy. The tension between experts and citizens can thus be reduced through the use of information technology. Others supported his view by arguing that the internet has widened public participation because it has made access to information easier and cheaper. Thus, participatory opportunities are more readily available through the internet (e.g., Bohman, 2004; Dahlgren, 2005; Hague & Loader, 1999; Howes, 2002; Tullock, 1970). Still others, however, are not as optimistic. Davis (1999), for one, claimed that the assumption that technological innovation itself can lead to greater public control of the agenda-setting process in government is problematic. Tesh (2000) also argued that the internet merely offers another way to speak to an ear that is not listening. Golding (1996) and Wilhelm (2000) supported his position.

Whose opinion is right? Can the new technology make a positive difference? This article, by synthesizing key findings from an array of past research, attempts to find justifiable answer to this question, or minimally, find possible ways that could help alleviate the traditional democratic policy-making tension.

2. An analytical framework

Of many theoretical frameworks regarding the internet's impact on citizen–expert relations, the most outstanding is the perspective that the

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² “Expert” is often deemed as a technical people who can use information to construct an expert–client relationship of influence (Rifkin and Martin, 1997, p. 30 and 37).

internet influences the relationship between the experts and the citizens in the policy process by way of reducing their resource (capital) differences. It changes the balance of power by changing the resource possession between the information privileged and the information disadvantaged. Coleman (1990), for one, distinguishes four forms of capital in modern production relationships: physical, financial, human, and social capital.

Physical capital is made up of tools, machinery, raw materials, and other productive equipments. While in general many believe that there are parallels between the printing press era and the information age and that both the internet and the printing press have positive and negative impacts on people's life (Dewar, 1998; Howes, 2002), some claim that the internet creates a new public sphere, which influences the policymaking arena and reduces comparative physical resource advantages of experts over citizens (Alexander & Pal, 1998; Bohman, 2004; Cleveland, 1985; Dahlgren, 2005; Hague & Loader, 1999; Howes, 2002; Tullock, 1970). Howes (2002), for one, argued that the deployment of the internet can make printed information and new political ideas more accessible and this has a real impact on decision making.

Others, however, oppose the above views. For example, Golding (1996) argued that the internet could nourish and enhance the public sphere, but that it also could lead to many social problems, especially the "mediatization" of the differentiated access to new technologies, exclusion of the poor, privatization, deregulation, and globalization. Many other scholars have similar idea (e.g., Mueller, Tollison, & Willett, 1972; Schlosberg & Dryzek, 2002; Tesh, 2000). Giddens (1998), for example, highlighted the loss of faith in expert knowledge and institutions because of the prevalence of the internet. Beck (1992, 2005) observed that citizens have started to distrust scientific expertise itself, the state, and industry because scientific worldviews encourage them to be skeptical about claims to authority.

Financial capital is comprised of monetary wealth, and it is the original meaning of capital. Many scholars agree that the internet may change the payoff structure between citizen and experts through easier and cheaper access to information and participatory opportunities through the internet to the citizens (Alexander & Pal, 1998; Bohman, 2004; Cleveland, 1985; Dahlgren, 2005; Hague & Loader, 1999; Howes, 2002; Tullock, 1970). Cleveland (1985) even argued that information can replace financial capital, labor, and physical materials, and that "any machine that can be accessed by computerized telecommunications doesn't have to be in your own inventory" (p. 186). Some researchers, however, stressed that the internet in fact enlarges the financial capital difference between experts and citizens by expanding the digital divide (Malina, 1999), strengthening domination by particular actors (particularly political parties and media corporations), enhancing managerialism in the policy process, reinforcing social isolation, and hindering civic involvement, rather than opening significant new opportunities for citizens' participation (Margolis & Resnick, 2000). It transforms street-level bureaucracies to system-level bureaucracies like experts (Bovens & Zouridis, 2002).

Human capital refers to people with knowledge and skills. In modern neoclassical economic literature, this term dates back to Jacob Mincer (1958). The best-known work on this, however, is by Becker. To him, human capital refers to "expenditures on education, training, medical care, etc." It differs from physical or financial capital, because "you cannot separate a person from his or her knowledge, skills, health, or values the way it is possible to move financial and physical assets while the owner stays put" (Becker, 1993, p. 16). Schultz (1992) directly defines human capital investments as enrollment rates multiplied by the cost of education for one individual. Of all the dimensions of human capital, one important dimension is technical-know how, namely, knowledge and information. While knowledge and information are considered to be different entities (Frenzel, 1987; Morgan & Peha, 2003), they nonetheless represent a type of capital that plays an important role in the production and transaction process (e.g., Aghion & Howitt, 1992; Bacon, 1997; Castells, 2002; Lan & Scott, 1996; Sjöberg, 1998; Romer, 1990). Thus, human capital can be improved through investment in education and training (Becker, 1993).

Some studies, however, claim that information availability is different from information perception and utilization. Therefore, even if information is made easily available by the internet, it may be impossible for an already fragmented and non-deliberative populace to capitalize on it (Alexander & Pal, 1998; Shenk, 1997; Lan & Scott, 1996).

The idea of social capital can be traced back at least to the theories by Karl Marx, Alexis de Tocqueville, and Emile Durkheim (Ostrom & Ahn, 2003; Carroll & Stanfield, 2003, p.398). As Putnam argues, "the core idea of social capital theory is that social networks have value" (2000, pp. 18–19). To him, social capital in fact refers to "connections among individuals" and "is closely related to what some have called 'civic virtue'" (p. 19). Francis Fukuyama deems social capital "as a set of informal values or norms shared among members of a group that permits cooperation among them" (1999, p.16). Ostrom and Ahn stressed three broad forms of social capital: trustworthiness, network, and formal and informal rules or institutions, and viewed social capital as "an attribute of individuals and of their relationships that enhances their ability to solve collective action problems" (Ostrom & Ahn 2003, p. xiv). Castells (2002), Lin (2001), and Resnick (2001) echoed this view. Uslaner (2000), however, argued otherwise.

The internet neither destroys nor creates social capital. There are altruists, as well as scoundrels, on the net, just as there are in everyday life. Indeed, the internet, like television, mirrors everyday life. What people do online is pretty much what they do offline: shop, get sports news and weather, plan vacations, and, most of all, contract people they already know through email. The net is not a threat. Neither is it Nirvana" (p. 62).

Beyond the capital identified by Coleman, Bohman (2004) argued that the internet incites new institutional innovations that enhance citizens' organizational capital. Organizational capital refers to accumulated information in the firm, and is viewed as an important resource from which favored individuals or parties could take advantage in realizing their interests (Proscott & Visscher, 1980). Tomer (1998) also explained how two new types of organizational capital—pre-organizational and linking—are formed.

The above discussions show that there exist at least five types of capital resources: physical, financial, human (mainly information and knowledge capital), social, and organizational. The possession of these resources divides the information rich (experts) and the information poor (lay citizens), affecting their perceptions, their ability to influence, and their status in the policy process. The internet affects the relationship and interaction of these policy actors by way of affecting their capital resource differences.

The internet's impact on expert-citizen interactions is also constrained by some exogenous variables, which cannot be drastically changed or influenced by the internet itself. These exogenous variables can be classified into three categories: those that pertain to individuals' personal characteristics (such as prior educational attainment, wealth, gender, computer knowledge, and attitudes), those that pertain to environmental factors (such as political or communication culture and geographical locations), and those that relate to institutional arrangements. These exogenous factors independently determine the resource positions of both citizens and experts, in spite of the impact of internet technology (Lan & Falcone, 1997). This is why Dutton (1999) argued that "digital government can erode or enhance democratic processes ... [but] the outcome will be determined by the interaction of policy choices, management strategies and cultural responses—not by advanced technology alone."

This framework is presented in Fig. 1.

3. Data collection

This article is a meta-analysis. Sample articles and books for this study were collected using a number of methods. First, a comprehensive search was made through Google Scholar using key works and phases such as "internet," "web," "digital," "electronic," "expert," "public," "citizen," "decision," "policy," "policy making," "internet + expert," "internet +

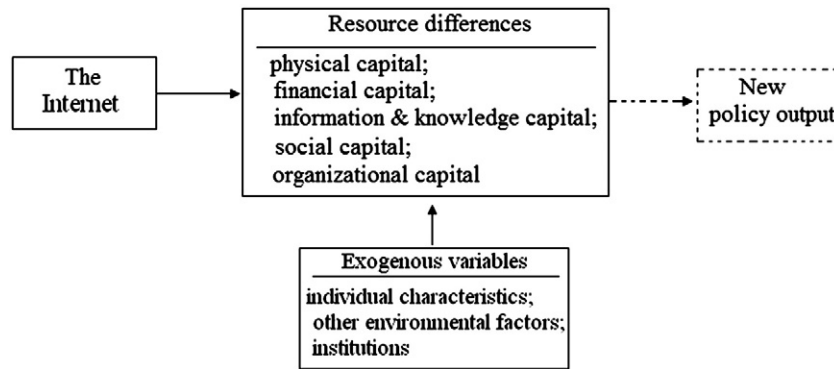


Fig. 1. A framework for the meta analysis.

democracy,” “expert + public,” and “citizen + policy” in January of 2007. In total, 160 articles came out of the research. *Second*, 20 articles were selected using JSTOR advanced search through the use of similar keywords in article titles and abstracts without limiting the time of publication and types of journals. *Third*, 10 articles used in two courses (E-Government/Information Technology Policy taught in the spring of 2007, and The Role of Experts in the Policy Process taught in the fall of 2006 at Arizona State University) were included. These articles were further defined according to their relevance to the research question: What is the impact of the internet on expert–citizen interactions? As a result, a total of 66 articles, three book chapters, and 16 books were selected. The selection criteria used were: (1) the study must be academic and well written; (2) the study is directly related to the topic of the impact of the internet on expert–citizen interactions in policymaking; and (3) even if the study does not directly explore the topic, its analyses are indirectly related to it or significantly explore some parts of the topic. A full list of these studies, the methods they use, their regions of studies, levels of analysis, and time spans are shown in Appendix A. While a random sample was not deemed necessary, the studies included in this analysis could be viewed as versatile and representative.

Among the selected literature (a total of 85 pieces), 43 pieces (articles, chapters or books) are theoretical studies,³ accounting for 50.59%; the other 42 pieces are empirical studies,⁴ accounting for 49.41%, including surveys (22 pieces, about 25.88% among all the works), Case studies (16 pieces, about 18.82% among all), experimental studies (8 pieces, about 9.41% among all), interview (4 pieces, about 4.71% among all), simulation (1 piece, about 1.18% among all), content analysis (1 piece), observation (1 piece), and focus groups (1 piece) (see Fig. 2).⁵ The distribution of publication years is also in Fig. 3. As the figure shows, they are mostly published after 1990.

These articles have analyzed different levels of decision making including: a) the international (or transnational), b) national, c) state or local (including regional, city, metropolitan, and county), d) community or street (including organizations, such as colleges and schools, or home and families), and e) individual levels. Some are not specific on the levels of policies they concern.

4. Theoretical arguments made by various authors

We first reviewed the 43 theoretical papers. Among them, 27 papers addressed the issue of resource difference (Table 1), and 25 papers addressed the impact of exogenous variables on citizen

³ If some studies only use some very simple examples or simply cite other researchers' empirical findings but not do a meta-analysis to support their ideas, they are also deemed as theoretical studies here.

⁴ Three articles (Fischer, 1993; Garland, 1999; Resnick, 2001) which are mainly theoretical but also use case study to support their ideas are also deemed as empirical studies here.

⁵ Some pieces may include multiple methods, so they are counted in different methods.

participation in policy making (Table 2). The reason the total is more than 43 is because some papers addressed both issues. They are marked by a * in both Table 1 and Table 2). Using a latent scheme method, content analyses were performed on the conclusions made by these papers and presented in Table 1 and Table 2.

As Table 1 shows, a total of 27 studies covered the topic of resource difference; some articles discussed more than one dimension of resource difference. Therefore, the tally on resource difference amounts to a total of 42. Of the five dimensions of resource difference, 27 accounts agree that the internet has reduced resource difference, while 15 accounts argue against it. Among them, 16 studies analyzed physical capital differences (9 “yes” and 7 “no”); 10 studies analyzed financial capital differences (7 “yes” and 3 “no”); 9 studies analyzed information and knowledge capital differences (7 “yes” and 2 “no”); 3 studies analyzed social capital differences (2 “yes” and 1 “no”); and 4 studies analyzed organizational capital (2 “yes” and 2 “no”).

In summary, most theoretical arguments about the internet's impact on reducing expert and citizen resource difference focus on its impact on the reduction of physical capital differences, followed by the attention on the reduction of the resource difference in financial capital, information capital, and social capital, and organizational capital. It appears that the impact of the internet on financial capital and information/knowledge capital is the most outstanding.

Table 2 presents a tabulation of the arguments by the theoretical literature on the impact of the exogenous variables on resource difference reduction. Individuals' personal characteristics include: social status (Margolis & Resnick, 2000), knowledge background (Shanteau, 1992), organizational capacity (leadership or organize people to work together) (Alexander & Pal, 1998; Shenk, 1997), capability to translate internet information to knowledge (Shanteau, 1992), ability to use appropriate decision strategies (Shanteau, 1992), and motivations and preferences (Alexander & Pal, 1998; Lan & Falcone, 1997; Shanteau, 1992; Shenk, 1997). For example, Lan & Falcone (1997) argued that “Decisions concerning the collection, processing, storage, and dissemination of information should take into consideration user preferences for information, economic efficiency in obtaining and providing information, and the balance that must be struck between proprietary concerns and accessibility” (p. 254). Shanteau (1992) pointed out that expert competence in decision making depends on five components: sufficient knowledge of the domain, the psychological traits associated with experts, the cognitive skills necessary to make tough decisions, the ability to use appropriate decision strategies, and a task with suitable characteristics.

Environmental variables include: a task with suitable characteristics (Shanteau, 1992), policy field that is particularly conducive to the use of internet (Zavestoski & Shulman, 2002, p. 326),⁶ geographical location (Kinoshita, 1995) organizational features (ibid), contemporary

⁶ For example, Zavestoski & Shulman, 2002, p. 326 argued that environmental policy area is where internet can be very efficiently used for enabling communication between citizens and policy makers.

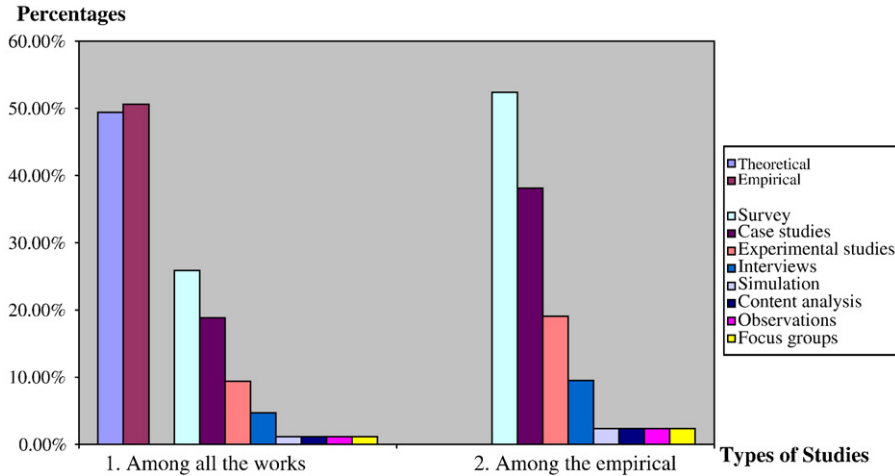


Fig. 2. Distribution of the Data.

environment of political communication (Dahlgren, 2005), and political and civic culture (Dahlgren, 2005; Bohman, 2004). All these factors are presented as environmental variables that could have an impact on people's use of the internet in the policy making process.

Institutional variables pertain to the institutional factors that affect citizens' access and use of the internet. They include: the mechanism of trust (a major component of social capital) building between experts and citizens (Feldman, 2000; Zavestoski & Shulman, 2002); grassroots citizen groups as citizens' organizational capital (Tesh, 2002); the rules for accepting a combination of scientific knowledge and social knowledge such as the moral, ethical, cultural, and behavioral dimensions of issues and the rule that local "non-scientific" knowledge has a legitimate claim in policy making as much as scientific knowledge (Fischer, 1999, 2000; Jadad et al., 2000); effective partnership between scientific experts and the general public (Argyris et al., 1985; Catron & Harmon, 1981); education that enables organizations to work collaboratively under the guidance of similar institutional principles such as that in NII (Howes, 2002); technical institutions (Lan & Falcone, 1997); institutional arrangement of public participation (Bohman, 2004; Joss, 2002; King et al., 1998); and institutional innovation (Madon, 2000; Margolis & Resnick, 2000) such as consensus conference, citizens' conferences, scenario workshops, technology assessments (Joss, 2002).

Bovens and Zouridis (2002) presented four institutional innovations—the introduction of ICT (Information Communication Technology) supervision, hardship clauses and panels, public accessibility to expert systems, and transparency as a constitutional ideal—to help embed the new system-level bureaucracies in the constitutional state. Rowe and Gammack (2004) discussed technical innovations such as a web-based framework called DOME (Pahng et al., 1998), multi-criteria e-negotiation

Systems (Insua et al., 2003), and Decision Support Systems which provide communication between experts and the public and expert participation in virtual groups (Grönlund, 2003). Certainly, our list neither exhausts all the important institutional variables nor represents their best available typological classification. They are recorded as they have come forth in the discussions of the authors we have reviewed.

As Table 2 shows, all of the individual variables (characteristic, environmental, and institutional) have been listed as having impact on citizen–experts' use of interaction for policy making interactions. Among them, institutional variables stand out to be the most important, with institutional innovation taking the lead, followed by institutional arrangement of public participation, knowledge acceptance rules, expert–citizen relationships, and the mechanisms of trust building. Personal motivation and preferences, however, stand out to be the most important variable under personal characteristics.

5. Empirical findings

Other than our effort to tabulate the results from the theoretical papers, we also paid close attention to the conclusions drawn by empirical studies which included case studies, experiments, surveys, focus groups, and simulations. They are reviewed and summarized as follows.

Based on three case studies involving two environmental decisions made at the local and regional level in the United Kingdom, Kingston et al. (2000) claimed that internet-based technologies demonstrated the tendency to widen public participation. Based on his ethnographic case study of Huaxia Zhiqing (Chinese Educated Youth, <www.hxzq.net>), Yang (2003) argued that the internet facilitates civil society activities by offering new possibilities for citizen participation in

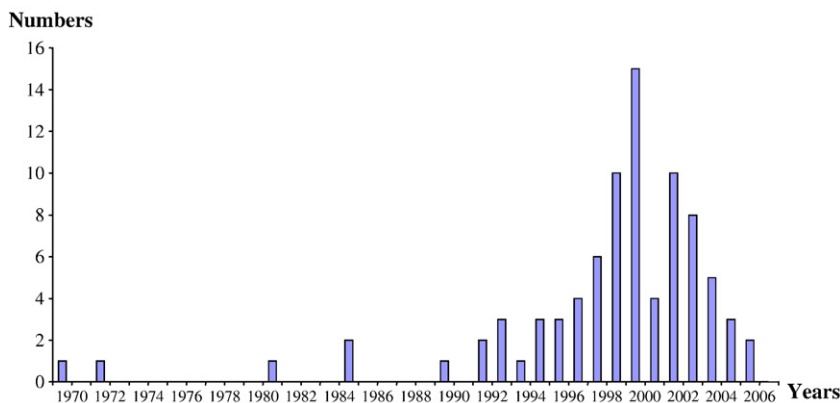


Fig. 3. Time distribution of the data.

Table 1
Theoretical arguments on internet's impact on resource difference reduction.

Authors and studies	Capital									
	Physical		Financial		Information and knowledge		Social		Organizational	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Alexander & Pal (1998)*	1		1			0				
Beck (1992)		0								
Beck (2005)		0								
Bohman (2004)*	1		1		1				1	
Bovens & Zouridis (2002)*				0						
Castells (2002)							1			
Cleveland (1985)	1		1							
Dahlgren (2005)*	1		1		1					
Fellers et al. (1995)									1	
Fischer (2000)*					1					
Giddens (1998)		0								
Golding (1996)		0								
Hague & Loader (1999)	1		1		1					
Howes (2002)*	1		1		1					
Kinoshita (1995)*					1					
Lin (2001)							1			
Lupton (1999)	1									
Malina (1999)				0						
Margolis & Resnick (2000)*				0	1					
Mueller et al. (1972)		0								
Schlosberg & Dryzek (2002)		0								0
Shapiro (1999)	1									
Shenk (1997)*						0				
Tesh (2000)		0								
Tulloch (1970)	1		1							
Uslaner (2000)								0		
Zavestoski & Shulman (2002)*										0
Total Number	9	7	7	3	7	2	2	1	2	2
	Number of theoretical studies reviewed = 27									

Note. * also used in Table 2.
1 = yes; 0 = no.

China. Using NES (American National Election Surveys) survey data and multivariate analysis, Tolbert and McNeal (2003) found that respondents with access to the internet and online election news were significantly more like to report voting in the 1996 and 2000 presidential elections, even after controlling for socioeconomic status, partisanship, attitudes, traditional media use, and state environmental factors. That is, the internet stimulates increased participation.

Wilhelm (2000), however, came up with a different result. Using data from the U.S. Department of Census, his own national survey, case studies, content analysis of Usenet discussion group, and the experiments done in 1990s, he concluded that technologies are “framed largely as threats” because they “as currently used, largely unravel the democratic character of the public sphere” (p. 10).

Tolbert and McNeal (2003)'s study reveals the internet's impact on financial capital difference reduction by showing that citizens' increased participation over time is due to the notion that “the internet meets citizen demand for political information in a more convenient form and at a lower cost (price and time) than the traditional media” (p. 184). In another study, using a comprehensive survey of official government websites in the central cities of 100 largest U.S. metropolitan areas from February 4 to 19, 2004, Scott (2006) found that the use of websites greatly reduces the cost of the information and makes local government much more accessible and accountable to interest users through offering a wide array of information, communication, and transaction services. Kingston et al.'s studies support the same idea (2000). Others, however, have found the opposite. Wilhelm (2000), for example, found that the digital divide and the increased complexity of public issues caused by the internet in fact increase the cost of citizens' participation in the U.S.A. at the national, netgroup, and home levels. Using data from a survey based on a national random sample of American adults, Nie and Erbring (2002) found that the more time people spend using the internet, the more they lose contact with their social environment. Using three cases of the

United States, Britain, and the European Union, Chadwick and May (2003) argued that the domination by particular actors (political parties and media corporations), managerialism in the policy process, the reinforcement of social isolation, and the encumbrance of civic involvement (rather than opening significant new opportunities for citizens' participation) have marginalized the democratic potential of the internet.

Both Kingston et al. (2000) and Tolbert & McNeal (2003)'s study found that the internet has improved the information availability to citizens, and facilitated increased expert–citizen interactions. Some researchers have found that there is a disparity between the availability of information and the actual perception and utilization of that information by the policy makers. For example, using three case studies, Sjöberg (1998) found that experts and the public frequently have very different views of what risk is. Based on a survey in Arizona, Lan and Scott (1996) also found a perceived disparity between agencies' perceived availability of computer-mediated information from its actual utilization. Through an experiment about food safety, Hayes, Fox, and Shogren (2002) found that the negative information clearly dominated when both positive and negative information were simultaneously presented. They also argued that “it was true even though the source of the negative information was identified as having come from a consumer advocacy group and that the information itself was written in a manner that was non-scientific” (p. 185). In addition, some studies also reported doubts about the quality of web-based information. Based on a survey of 1041 respondents in 1998 to 1999, and using data from a cross sectional survey of 21 frequently accessed websites about depression, Griffiths and Christensen (2000) found the overall quality of the information on the websites was poor and typically did not cite scientific evidence to support of their conclusions. Flanagin and Metzger (2000), by analyzing a survey done in the U.S.A, further found that overall people rarely verified web-based information, which is potentially inaccurate and biased, and “considered internet information to be as credible as that

Table 2
Theoretical arguments on the impact of exogenous variables on resource difference reduction.

Authors and studies	Exogenous factors																					
	Individual characters						Environmental factors							Institutional factors								
	a ₁	a ₂	a ₃	a ₄	a ₅	a ₆	b ₁	b ₂	b ₃	b ₄	b ₅	b ₆	b ₇	c ₁	c ₂	c ₃	c ₄	c ₅	c ₆	c ₇	c ₈	
Alexander & Pal (1998)*			1			1																
Argyris et al. (1985)																	1					
Bohman (2004)*												1								1	1	
Bovens & Zouridis (2002)*																						1
Catron & Harmon (1981)																	1					
Dahlgren (2005)*										1			1									
Feldman (2000)														1								
Fischer (1999)																	1					
Fischer (2000)*																	1					
Grönlund (2003)																						1
Howes (2002)*																		1				1
Insua et al. (2003)																						1
Jadad et al. (2000)																1						
Joss (2002)																					1	1
King et al. (1998)																					1	
Kinoshita (1995)*									1	1												
Lan & Falcone (1997)						1														1		1
Madon(2000)																						1
Margolis & Resnick (2000)*	1																					1
Pahng et al. (1998)																						1
Rowe & Gammack (2004)																						1
Shanteau (1992)		1		1	1	1	1															
Shenk (1997)*			1			1																
Tesh (2002)																1						
Zavestoski & Shulman (2002)*																1						
Total number	1	1	2	1	1	4	1	1	1	1	1	1	1	2	1	3	2	1	1	3	3	11
	Number of theoretical studies reviewed = 25																					

Note. *also used in Table 1.

1 = studies this factor and says “yes” for its influence.

a₁ = social status; a₂ = knowledge background; a₃ = organizational capacity; a₄ = the ability to translate internet information to knowledge; a₅ = the ability to use appropriate decision strategies; a₆ = Motivation and preferences.

b₁ = A task with suitable characteristics; b₂ = Policy field; b₃ = Geographical locations; b₄ = Organizational features; b₅ = Contemporary environment of political communication; b₆ = Political Culture; b₇ = Civil culture.

c₁ = the mechanism of trust building; c₂ = Grassroots groups; c₃ = Knowledge combination; c₄ = expert–citizen partnership; c₅ = Education system; c₆ = technical institutions; c₇ = Institutional arrangement of public participation; c₈ = Institutional and technical innovation.

obtained from television, radio, and magazines, but not as credible as newspaper information” (p. 515).

Using a variety of empirical research methods such as observation, survey, and focus groups, Hampton and Wellman (2000) found that the internet, through supporting “a variety of social ties, strong and weak, instrumental, emotional, social and affinitive” (p. 207), has helped people establish and maintain their social networks which are good for civic engagement at the community level in Canada. These relationships facilitated by the internet, however, are often sustained through a combination of online and offline interactions rather than maintained through computer-mediated communication alone. Other empirical studies on this topic have not been found.

As to the studies on organizational capital differences, using a case study of a Boston-based citizen association, the Telecommunication Policy Roundtable-Northeast (TPR-NE) in 1995, Klein (1999) found that online forums facilitate the formation and operation of citizens' associations and “allow associations to be more responsive, more robust, and able to unite more members” (p. 213). Other empirical studies about this topic cannot be found in our data set.

Table 3 presents a tabulation of the results of these empirical studies on resource difference reduction.

A total of 15 articles discussed the impact of internet on reducing resource difference between experts and the citizens. Among five types of resource reduction, physical, financial, and information and knowledge capital reduction stand out. There are more positives than negatives in the financial and information/knowledge category, showing that these are the areas of distinguishable improvements. While there is a high frequency of successful cases in reducing physical capital, there is an equally high frequency (a little less than

the positives) of the cases that does not work. This evidence shows that beyond internet technology, other factors (exogenous) may also have an impact. The tally of the empirical evidence largely confirms to the arguments made by the theoretical papers.

Table 4 presents a tabulation of the results of the empirical studies on exogenous variables⁷ (The studies marked with * are included in both Tables 3 and 4). A total of 33 papers fall into this category, accounting for 78.57% among the 42 empirical studies we identified.

Among the 33 works, education and knowledge stand out to be the most important factor, followed by citizen–expert relationships, age, gender, attitudes, and prior experiences. While other factors have all had their impact, these few have proven to be among the most important. Furthermore, these empirical studies also indicate the importance of institutional arrangements. Among the 33 studies, 16 works (48.5% in the total) emphasized the importance of institutions.

6. Conclusion, recommendations and implications

From the above review of 85 theoretical and empirical studies of the internet's impact on reducing resource differences between experts and citizens in general, a number of observations can be made.

First, the internet is a viable tool that has worked to reduce resource differences between the experts and the citizen in general. This effect is easily identifiable in areas of physical capital resource difference reduction, financial capital resource difference reduction, and information/knowledge capital resource difference reduction.

⁷ Five empirical studies (Chadwick & May, 2003; Klein, 1999; Wilhelm, 2000; Hayes et al., 2002; Scott, 2006) are included in both Table 3 and Table 4.

Table 3
Empirical results on the impact of the internet on resource difference reduction.

Authors and studies	Methods	Capital									
		Physical		Financial		Information and knowledge		Social		Organizational	
		Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Chadwick & May (2003)*	C				0						
Kingston et al. (2000)	C	1		1		1					
Sjöberg (1998)	C						0				
Yang (2003)	C	1									
Resnick (2001)	C							1			
Klein (1999)*	C									1	
Wilhelm (2000)*	C, Co, E,S		0		0						
Hayes et al. (2002)*	E						0				
Hampton & Wellman (2000)	F, O, S							1			
Lan & Scott (1996)	S						0				
Flanagin & Metzger (2000)	S						0				
Griffiths & Christensen (2000)	S						0				
Nie & Erbring (2002)	S				0						
Scott (2006)*	S			1							
Tolbert & McNeal (2003)	S	1		1		1					
Total number		3	1	3	3	2	5	2	0	1	0
Number of empirical studies reviewed = 15											

Note.*also used in Table 4.

1 = yes; 0 = no; C = case study; Co = content analysis; E = Experiment; I = Interview; O = observation; S = Survey.

Social and organizational capital resource difference reduction is less obvious and less extensive. Authors have found that the public can function as well as experts given some particular situations (Kenyon and Edwards-Jones, 1998; Yearly, 2000). Reducing the resource difference between the public and expert promotes citizens' ability to participate in public policy making.

Second, the usefulness of the internet in reducing resource difference is promoted or constrained by factors that are exogenous to the internet itself. Individual user's education, knowledge, age, gender, attitudes, and prior experiences all affect the impact of the internet. These are factors that should not be overlooked. Indeed, the advent of internet technology may somehow enlarge the gap in citizens' policy making participation. Access to the internet is often dominated by well-educated, affluent, high-social-status (particularly, dominated by political parties and media corporations) young males whose use is different from the less educated people who seem to be interested particularly in the entertainment functions of the internet (Chadwick & May, 2003). More educated citizens use the internet more actively and their use is more information oriented. The attitudes and moral values of experts and citizens also play a crucial role in forming their different information perception (Bonfadelli, 2002; Hölscher & Strube, 2000). Given that ordinary citizens were not prepared to take advantage of the internet technology, the availability of the internet may create what is known as the second-order dilemma, enlarging rather than reducing citizens' ability to participate in democratic policy making.

Thirdly, institutional factors have clearly stood out to be important explanatory variables for internet impact. Consensus shows that institutional arrangement and citizen-expert participation are among the most important variables. And institutional innovation is considered to be the most effective way in improving citizen expert interactions in policy making.

Uslaner (2000) at one time pointed out, "The web is very much like the physical world, making things better in some ways and worse in others" (p. 64). The theoretical and empirical studies have demonstrated to us that we have no reason to be pessimistic about the usefulness of the internet and that we have much to do to improve its potential for more effective use. Strategies for improving citizen-expert interaction by way of the internet could include:

- (1) Treat the internet's ability to reduce physical, financial, and information/knowledge resource difference seriously and consistently work to promote the availability of the internet

and availability of valuable information and knowledge to the citizens, in spite of voices of suspicion.

- (2) Educate the public through multiple methods and train them to be competent users of the internet both in terms of technical ability preparation and psychological attitudes.
- (3) Encourage institutional innovations. New mechanisms such as the consensus conference, citizens' conferences, scenario workshops, technology assessments, new decision support systems, and new assessment tools should be developed to allow for more citizen participation and support new citizen-scholar relationship.

Experts need to become more knowledgeable about local sites; they need to be able to communicate with citizens in languages understandable by the citizens, and citizen's local knowledge needs to be considered as viable policy input. In such a scenario, experts are no longer traditional top-down arrogant experts, and citizens are no longer traditional ignorant bottom trash. The new collaborative citizen-expert relationship and the effective partnership between new experts and citizens should be developed using methods such as information transfer, community building, community meetings, combination of scientific and social knowledge, and trust building. Only in such an institutional arrangement can expert-citizen interaction be improved in public policy making.

Our meta-analysis here is not without flaws. In spite of our efforts to assemble all of the relevant studies on this topic, much valuable information may still have been missed. Also, because of the versatility of the studies in terms of topics, region, level of analysis, a more clearly specified and better theoretically supported research framework could be established in future studies.

Our study, however, has its value in that it has included a truly versatile and representative sample of the studies on this important policy issue. It has given us confidence that the internet has had a positive effect, and that there are ways for us to further improve its utility. Furthermore, the ability to maximize the potential of the internet in improving democratic public policymaking lies not only in technology but also in innovations in many other related areas such as education, institution building, and culture and trust relationship formulation. As put forward by Scott (2006), some authors have argued that "prospects for web-based public involvement also present important legal, technical, fiscal, organizational, and professional issues that are best addressed by active involvement by public administrators" (Scott, 2006, p. 350). To make the internet work for improving

Table 4
Empirical results on the impact of exogenous variables on resource difference reduction.

Authors and studies	Methods	Exogenous factors																				
		Individual characteristics								Environmental			Institutional									
		<i>a</i> ₁	<i>a</i> ₂	<i>a</i> ₃	<i>a</i> ₄	<i>a</i> ₅	<i>a</i> ₆	<i>a</i> ₇	<i>a</i> ₈	<i>b</i> ₁	<i>b</i> ₂	<i>b</i> ₃	<i>c</i> ₁	<i>c</i> ₂	<i>c</i> ₃	<i>c</i> ₄	<i>c</i> ₅	<i>c</i> ₆	<i>c</i> ₇	<i>c</i> ₈	<i>c</i> ₉	<i>c</i> ₁₀
Chadwick & May (2003)*	C	1																				
Eden (1996)	C													1								
Fischer (1993)	C															1						
Garland (1999)	C																					
Guston (1999)	C																					
Klein (1999)*	C																					
Musso & Weare (2005)	C																					
Batterbury (2003)	C													1								
Sjöberg (1998)	C																					
Wilhelm (2000)*	C, Co, E, S	1	1	1				1	1	1												
Yearley (2000)	C, I, F		1																			
Solop (2001)	C, S				1																	
Pooley & Wilcox (2000)	C, Si																					
Hayes et al. (2002)*	E									1												
Hölscher & Strube (2000)	E							1														
Kersten (2003)	E													1								
Nückles & Stürz (2006)	E																					
Barabas (2004)	E, S																					
Ettorre (1999)	I																					
Kwak (1999)	I																					
Kenyon & Edwards-Jones (1998)	I, S		1																			
Babcock et al. (1995)	S																					
Bonfadelli (2002)	S		1	1	1																	
Chong & Theng (2004)	S				1																	
Comber et al. (1997)	S				1	1	1															
<i>Journal of Blacks in Higher Education</i> (2001)	S		1						1													
Lan & Cayer (1994)	S																					
Northrop et al. (1990)	S																					
Price & Zaller (1993)	S		1																			
Reinen & Plomp (1993)	S					1																
Reinen & Plomp (1997)	S					1																
Riquelme & Buranasantikul (2004)	S									1												
Scott (2006)*	S																					
Total number		2	6	2	4	3	3	2	3	1	1	1	1	1	2	5	1	1	2	1	1	2
Number of empirical studies reviewed = 33																						

Note.* also used in Table 3.

1 = studies this factor and says "yes" for its influence; C = case study; Co = content analysis; E = Experiment; I = Interview; O = observation; S = Survey.

*a*₁ = social status; *a*₂ = knowledge background; *a*₃ = wealth; *a*₄ = age; *a*₅ = gender; *a*₆ = Prior experience; *a*₇ = Minority; *a*₈ = attitude & values.

*b*₁ = web quality; *b*₂ = negative information; *b*₃ = eras.

*c*₁ = aid rules; *c*₂ = activist organizations; *c*₃ = knowledge combination; *c*₄ = expert-citizen partnership; *c*₅ = government rules; *c*₆ = online forums; *c*₇ = education systems; *c*₈ = technical institutions; *c*₉ = deliberative democracy; *c*₁₀ = institutional innovation.

Appendix A. A List of the Selected Literature

Authors	Methods	Place	levels	The time span
Alexander & Pal (1998)	Theoretical	NR	NR	NR
Argyris et al. (1985)	Theoretical	NR	NR	NR
Beck (1992)	Theoretical	NR	NR	NR
Beck (2005)	Theoretical	NR	NR	NR
Bohman (2004)	Theoretical	NR	NR	NR
Bovens and Zouridis (2002)	Theoretical	NR	NR	NR
Castells (2002)	Theoretical	NR	NR	NR
Catron and Harmon (1981)	Theoretical	NR	NR	NR
Cleveland (1985)	Theoretical	NR	NR	NR
Dahlgren (2005)	Theoretical	NR	NR	NR
Feldman (2000)	Theoretical	NR	NR	NR
Fellers et al. (1995)	Theoretical	NR	NR	NR
Fischer (1999)	Theoretical	NR	UC	NR
Fischer (2000)	Theoretical	NR	UC	NR
Giddens (1998)	Theoretical	NR	Global	NR
Golding (1996)	Theoretical	Global	Global	NR
Grönlund (2003)	Theoretical	NR	UC	NR
Hague & Loader (1999)	Theoretical	NR	UC	NR
Howes (2002)	Theoretical	NR	UC	NR
Insua et al. (2003)	Theoretical	NR	UC	NR
Jadad et al. (2000)	Theoretical	NR	UC	NR
Joss (2002)	Theoretical	NR	UC	NR
King et al. (1998)	Theoretical	NR	UC	NR
Kinoshita (1995)	Theoretical	China	National	UC
Lan and Falcone (1997)	Theoretical	NR	UC	NR
Lin (2001)	Theoretical	NR	UC	NR
Lupton (1999)	Theoretical	NR	UC	NR
Madon	Theoretical	NR	UC	NR
Malina (1999)	Theoretical	NR	UC	NR
Margolis and Resnick (2000)	Theoretical	NR	UC	1960–2000
Moreno-Jiménez and Polasek (2003)	Theoretical	NR	UC	NR
Mueller et al. (1972)	Theoretical	NR	UC	NR
Pahng et al. (1998)	Theoretical	NR	UC	NR
Rowe and Gammack (2004)	Theoretical	NR	NR	NR
Schlosberg and Dryzek (2002)	Theoretical	NR	UC	NR
Shanteau (1992)	Theoretical	NR	UC	NR
Shapiro (1999)	Theoretical	NR	UC	NR
Shenk (1997)	Theoretical	NR	UC	UC
Tesh (2000)	Theoretical	Mainly U.S.	UC	1960–2000
Tesh (2002)	Theoretical	U.S.	Local	NR
Tullock (1970)	Theoretical	NR	UC	NR
Uslaner (2000)	Theoretical	NR	UC	NR
Zavestoski and Shulman (2002)	Theoretical	NR	UC	NR
Chadwick and May (2003)	Case study	U.S., Britain, EU	National	UC
Eden (1996)	Case study	Europe and UK	Global and national	1990s
Fischer (1993)	Case study	Alberta, Woburn	UC	1970s –1990s
Garland (1999)	Case study	U.S.	UC	NR
Kingston et al. (2000)	Case study	UK	Local and regional	1970s –2000
Musso and Weare (2005)	Case study	Los Angeles	State	1940s–1970s; unclear
Sjöberg (1998)	Case study	NR	UC	UC
Batterbury (2003)	Case study	West London	City	1990s–2003
Guston (1999)	Case study	U.S.	National	1997
Klein (1999)	Case study	Massachusetts	State and local	1994–1995
Resnick (2001)	Case study	NR	UC	NR
Pooley and Wilcox (2000)	Case study and simulation	NR	UC	NR
Solop (2001)	Case study and survey	Arizona	State	2000
Yang (2003)	Case study and survey	China	National	1999–2002
Wilhelm (2000)	Case study, content analysis, experiments, and survey	U.S.	National, netgroups, home, etc.	1990s
Yearley (2000)	Case study, interview, and focus groups	Sheffield, the U.K.	City	UC
Hayes et al. (2002)	Experiment	NR	UC	UC
Nückles and Stürz (2006)	Experiment	NR	Individual	UC
Kersten (2003)	Experiment	50 countries	International	1996–2004
Hölscher and Strube (2000)	Experiments	NR	UC	UC
Barabas (2004)	Experiments and surveys	Experiments, surveys	UC or NR	1995–1999
Hampton and Wellman (2000)	Focus groups, observation, and survey	Canada	Community	1997–1999
Ettorre (1999)	Interview	UK, Finland, The Netherlands, and Greece	International	1995–1996
Kwak (1999)	Interview	Dane County, Wisconsin	County	1992
Kenyon and Edwards-Jones (1998)	Interview and Survey	UK	UC	The summer of 1996
Lan and Scott (1996)	Survey	Arizona	Sate and local	UC
Bonfadelli (2002)	Survey	Switzerland	UC	1999–2000
Northrop et al. (1990)	Survey	U.S.	City	1976–1988
Price and Zaller (1993)	Survey	America	National	1989

(continued on next page)

Appendix A (continued)

Authors	Methods	Place	levels	The time span
Riquelme and Buranasantikul (2004)	Survey	Australia	National	September 2003
Babcock et al. (1995)	Survey	Arizona	State, county, city levels	NR
Chong and Theng (2004)	Survey	Singapore	National	UC
Comber et al. (1997)	Survey	Leicestershire	Colleges and high schools	UC
Flanagin and Metzger (2000)	Survey	U. S.	UC	1998–1999
Griffiths and Christensen (2000)	Survey	21 websites	UC	March 1999
Journal of Blacks in Higher Education (2001)	Survey	U.S.	National	2000
Lan and Cayer (1994)	Survey	Arizona	State and local levels	UC
Nie and Erbring (2002)	Survey	American	Individual	UC
Reinen and Plomp (1993)	Survey	21 countries	International	1989–1992
Reinen and Plomp (1997)	Survey	30countires	International	1989–1992
Scott (2006)	Survey	U.S.	Metropolitan	February 4 to 19, 2004
Tolbert and McNeal (2003)	Survey	U.S.	National	1996–2000

(Note. NR = not relevant; UC = unclear).

democratic public policy making, public administrators may have a larger role to play than what is conventionally expected of them.

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