Using a web-based simulation to elicit public input into ELT policy in Thailand

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Abstract

In many contexts, decisions about educational policies are restricted to a small group of insiders. Such is the case in Thailand where a heavily centralised education system means that educational policy decision-making is largely in the hands of the Minister of Education with very little input from groups outside the Ministry. The bases on which policy decisions are made appear problematic and have resulted in poor performance of the Thai educational system especially for the learning of English. There is, then, a need for more public input into English language teaching policy in Thailand, but eliciting such input effectively is problematic since education policy is a highly complex area with conflicting priorities competing for limited budgets. This paper introduces an innovative instrument for eliciting public input into ELT policies and presents preliminary findings. The Ministry of Education Game (https://sola.pr.kmutt.ac.th/meg/) is a web-based simulation that allows users to choose preferred projects while accounting for competing for broad goals and limited budgets. The two most frequently selected projects both directly address inequalities between schools. Although preliminary, such findings show the value of using a web-based simulation to elicit public input into policymaking.

Keywords: education policy, English language teaching, simulation, public opinion, Thailand

Introduction

Educational policies can have a massive impact on the effectiveness of education and yet, in many contexts, decisions about what educational policies to implement are restricted to a limited number of political insiders. Research (e.g. Rosekrans, 2006) suggests that making the policy-making process more inclusive, for example by eliciting and using public input in policy decisions, is likely to result in more effective and sustainable education policies. Eliciting useful input from the public, however, is highly problematic with the traditional methods of surveys and public hearings both having major drawbacks. In this paper, I will focus on eliciting public input on policy projects that could have beneficial impacts on English language education at secondary schools in Thailand and will propose that using a web-based simulation is an effective way of doing this. I will start by briefly examining the context of ELT policies in Thailand and argue for the need for more public input into policymaking. Then, I will critique the methods of eliciting public input that are currently used. In the main focus of this paper, I will introduce an innovative tool in the form of a web-based simulation for eliciting public input on which policy projects to implement, showing how it can overcome the weaknesses of traditional instruments. Finally, I will present some initial findings, and conduct a validation check of using simulations to elicit public input into educational policy.

Recent educational policy-making in Thailand

The quality of education is a constant cause for concern in Thai society with frequent reports of poor educational outcomes the norm. For example, "half of Thai students in schools are not acquiring the basic skills required for their own success" (UNESCO, 2016: 15), and "Thai youth do not meet the national standards in academic achievement or excel in international assessments" (Atagi, 2011: 9). In eleven recent international rankings of countries on student performance and educational quality, Thailand on average ranked at the 27th percentile, meaning that roughly three-quarters of countries perform better (Watson Todd, 2015).

Despite the government identifying the English language as a priority as far back as 1998, the international rankings of Thailand for general English proficiency are an even greater cause for concern. Based on five recent international ranking exercises, Thailand on average ranked at the 17th percentile for English proficiency (Watson Todd, 2015).

There are, then, major problems with the performance of the Thai educational system, especially for English language teaching, which need to be addressed. The main way of tackling such problems is to implement policy projects addressing the causes of the problems. In Thailand, however, the history of educational policymaking implies that the normal approaches to policy development need to be changed if beneficial and sustainable policy projects are going to be implemented to solve the current educational problems.

The development of an educational policy can involve a multitude of participants who can be divided into insiders, such as bureaucrats and politicians, and outsiders, such as public opinion, lobby groups, and the media. In most cases, insiders are the most influential decision-makers with politicians (such as the Minister of Education) having the final say on policies (Bown, Sumsion & Press, 2009). In making the final decisions, politicians often rely on personal experiences, beliefs, and anecdotes which can override the influence of expert advice and evidence (Niskanen, 1986). These patterns can be found in recent educational policy history in Thailand.

So far this century Thailand has had 19 Ministers of Education. Such a high turnover suggests that there could be a lack of consistency and sustainability in Thai educational policy, and this is indeed the case. Ministers promote their own pet projects based on their personal beliefs, but such projects are often dropped when the minister changes. Succeeding ministers focus on different aspects of education meaning that the long-term work in a particular area required for deep-rooted change is rarely possible. Negative media reports on educational issues lead to knee-jerk reactions from politicians resulting in projects being implemented without due consideration. Most importantly perhaps, the decision-making underpinning educational policy-making in Thailand is very opaque and is restricted to insiders with almost no public consultations. Research into policy effects, however, shows that policies are more likely to be beneficial when outsiders are also involved (Ansell & Gash, 2008).

Successful educational policy development

Given that the past insider-driven educational policies have had little beneficial effect on Thai education, we need to look for alternative approaches. UNESCO (2016) in their Thailand education report identify two key ways in which policy-making should change, both of which involve outsiders. First, "the country needs to make greater use of evidence to inform policy decisions" (p. 17), where the outsiders are the academic researchers producing the evidence. Second, "Thailand also needs more coherent, inclusive processes" (p. 17), indicating that the general public needs to become more involved in policy-making.

Basing policy on evidence appears to be straightforward but identifying credible evidence on which to base policy is actually problematic. To identify potentially relevant research, a search was conducted using Scopus to identify research relevant to ELT where at least one of the researchers has an affiliation with a Thai institution. 244 articles meeting these criteria were identified, but of these less than 10% focus on curricular issues that are easily translated into policy and only 12% look at ELT in schools (Watson Todd, 2018). Indeed, only 4 articles are clearly of relevance to ELT policy in secondary schools, an insufficient number on which to base a policy. For research outside Thailand which may be applicable to the context, the most credible research comes from meta-analyses that combine the results of multiple studies. These meta-analyses, however, generally focus on classroom practice (e.g. task-based teaching in Keck, Iberri-Shea, Tracy-Ventura & Wa-Mbaleka, 2006, and strategy instruction in Plonsky, 2011), rather than issues of policy. The overall pattern then is that, although evidence may provide some input into policy-making, it cannot be relied on as the sole basis for policy concerning ELT in Thai secondary schools.

If policy cannot be based on evidence, then perhaps we should look at how public opinion can provide input into policy. The obvious way of doing this is to use public opinion polls. Where a poll concerns a binary choice between two clearly distinct alternatives, gaining public opinion is relatively straightforward, if potentially costly. With an issue such as ELT policy in Thai secondary schools, however, choices are not clear-cut. The range of possible policy projects is large, one project can have both beneficial and detrimental effects, and the budget is limited meaning that hard choices between projects must be made (one problem with polling for multiple, non-conflicting policies is that respondents choose all possibilities). The complexity of the issue makes public opinion polling unsuitable (Walters, Aydelotte & Miller, 2000) with respondents asked to give immediate responses without necessarily knowing the alternatives (Fishkin, Luskin & Jowell, 2000).

If standard polling is inappropriate, we need to look for an alternative. The most commonly suggested alternative is some form of focus groups. Numerous suggestions for variations on focus groups have been made, including deliberative polling (Fishkin et al., 2000), public value forums (Keeney, von Winterfeldt & Eppel, 1990), and collaborative governance (Ansell & Gash, 2008). All of these involve complicated, time-consuming variations on traditional focus groups and the participation of experts in the groups, raising the question of whether such groups reflect public opinion or expert analysis. Furthermore, the limited number of people who can be involved make it unlikely that focus groups will be representative of public opinion.

Standard opinion polling and focus groups, therefore, both have major drawbacks. A more recent alternative approach that holds promise combines the use of Internet technology, simulations,

and gaming. For complex events such as policy choices, simulations facilitate the development of understanding and the generation of hypotheses (Landwehr, Spraragen, Ranganathan, Carley & Zyda, 2013). When combined with a gaming element for motivation (von Ahn, 2006), simulations can, first, provide optimal solutions to complex problems, and, second, elicit public opinion which incorporates some understanding of the context and the ramifications of decisions. To gain input from public opinion into ELT policy in Thai secondary schools, then, an online simulation was designed.

Using online simulations for eliciting public opinion on policy

The key features that make simulations effective for eliciting public opinion are that they allow constraints and complexity to be influential factors in the decision making of the respondents. A key constraint for the educational policy is that there is a limited budget. Since there is often a trade-off between the possible benefits of a project and its costs, the budget available must be spent wisely. Within the budget constraints, decisions are not simply a choice for a particular project, but also a choice not to implement a different project. The complexity of educational policy decision making can also greatly influence choices. Many projects have pros and cons, having a beneficial impact on one aspect of education but being detrimental to another. In many cases, it may be better to choose two projects with contrasting impacts so that they offset each other's detriments, even if one is not greatly preferred than to choose two projects with similar impacts.

How simulations are effective at dealing with such issues can be illustrated by comparing the use of a simulation to a traditional survey. Let us suppose that 50 possible educational projects have been identified. A typical questionnaire approach would ask respondents to rate each of these projects separately. To avoid complexity in instrument design, questionnaire ratings are usually based on a single criterion set by the researcher (e.g. How beneficial would each project be to Thai education). Since the projects selected for inclusion in the questionnaire would all have at least some beneficial impacts, it is likely that most sets of responses would lack discrimination with the vast majority of projects rated positively. The usefulness of such questionnaire findings is dubious for several reasons. First, with most projects having high ratings, the overall results do not provide any meaningful input for policy decision making. Second, the use of a single criterion contrasts with the complexities of real-world policy-making where multiple criteria need to be balanced. Using the single criterion of benefits ignores other issues such as costs. A project may be very beneficial but also very expensive with the costs not justifying the benefits. Third, two similar projects both fitting with a respondent's beliefs about education are likely to be rated very positively. However, in reality, since the two projects have similar impacts, only one would need to be implemented. Fourth, in a questionnaire asking respondents to rate 50 items, there is a high probability of respondent fatigue with responses becoming less and less reliable through the questionnaire (Ben-Nun, 2008). These problems mean that it is not simply the case that those projects that are rated most highly on a questionnaire and that fit a certain budget should be implemented. Indeed, it is very difficult to see how questionnaire ratings can be converted into project implementation.

Eliciting respondents' opinions of the same 50 projects through a simulation could overcome several of the problems associated with questionnaires. In a simulation, respondents are asked to

choose between projects within budget constraints rather than rate each project separately. In choosing projects, respondents are in effect comparing many projects on multiple self-selected criteria. Comparisons between different pairs of projects may be based on different criteria, and there may be shifts in criteria as the process of choosing projects becomes more refined. For example, the respondent may believe that a certain objective should be met and that a cluster of similar projects could all meet this objective. Deciding that at least one of these clusters should be chosen is based on the desire that the overall selection should cater to this objective. To achieve the objective, only one project from the cluster is needed, so the decision concerning which project from the cluster should be chosen would be based on a different criterion, such as cost. Such shifting and balancing of criteria reflect the complexities of real-world policymaking.

Simulations can be designed to have other advantages over questionnaires. Where questionnaires are usually answered linearly, simulations can encourage respondents to explore options and gain an overview of potential choices before they start making decisions. Simulations also provide opportunities to reverse previous decisions if respondents feel this is necessary. Ways of informing respondents about the potential impacts of a project can be integrated into the simulation and feedback on the combined effects of their decisions can be given. Finally, because simulations incorporate certain elements of gaming and because the processes that respondents go through are not purely repetitive, the chances of respondent fatigue influencing the results are lower. These advantages may combine to have two important effects. First, the output of a simulation is likely to be more directly applicable to the real context than the output of a traditional survey. Second, responses to a simulation may be more valid, a conjecture that can be investigated by attempting to validate the use of a simulation.

The MinEd Game

To illustrate how a simulation can elicit public opinion concerning secondary ELT policy decisions in Thailand, in this section I will present MinEd Game – a web-based simulation designed for this purpose. I will start by illustrating how MinEd game works with screenshots of the main pages of the program. I will then show some preliminary results from the first 300 users, and I will analyse these results to validate the use of a simulation to elicit public input into educational policy. In Figure 1 which shows the homepage of the website, the purpose of the simulation is given and users have a choice of whether to play the simulation in English or Thai.

The Ministry of Education Game

In this game, you will play the Thai Minister of Education. You are worried about levels of English in Thailand, and want to improve English teaching and learning at secondary schools. You need to decide which projects to spend money on to achieve this goal.

Continue

ในเกมนี้ คุณจะแสดงบทบาทเป็นรัฐมนตรีว่าการกระทรวงศึกษาธิการ คุณกังวลเรื่องระดับความสามารถทางภาษาอังกฤษในประเทศไทย และต้องการปรับปรุงการเรียนการสอนภาษาอังกฤษในโรงเรียนมัธยมศึกษา คุณต้องตัดสินใจว่าโครงการไหนจะใช้เงินให้บรรลุเป้าหมายของคุณได้

ดำเนินการต่อ

Figure 1 *MinEd Game homepage*

The next webpage, shown in Figure 2, gives the context of the simulation. To judge which projects are appropriate, users need to know the nine criteria for evaluating the impact of projects. MinEd game uses the criteria shown in Figure 3, all of which are based on genuine ratings of Thai education performance from sources such as the World Economic Forum and UNESCO.

Figure 2 *The context in MinEd Game*

Figure 3 *Criteria in MinEd Game*

With users fully aware of the context, they can now choose projects. There are 52 project variants available in the simulation which are categorised into the six categories shown in Figure 4. Each of these categories links to a page showing the actual projects with their costs, such as those in Figure 5. Guidance is given about which criteria choosing any particular project will affect. Projects can have both positive and negative impacts. For example, including open-ended items, such as essays, on the national ONET exams will increase overall education quality and general English proficiency, but will also lead to lower ONET scores and exacerbate inequalities in education, especially between Bangkok and rural areas. As users choose projects, their available budget is reduced, reflecting the constraints involved in educational decision making.

Figure 4 *Overview of MinEd Game projects*

Figure 5 *One category of MinEd Game projects*

Figure 6 shows the interface after a user has chosen, in this case, seven projects. The effects of the projects on the nine criteria are calculated and amalgamated to produce a report showing the overall effects of the user's project choices (shown in Figure 7). Explanations of the expected impacts of each project are provided. For example, for the last project in Figure 6 – employing local sources to create online apps for English learning – the explanation provided is "Given the

ubiquity of smartphones and their centrality to students' lives, creating online apps for learning English should be an effective way of improving English. However, previous government-initiated locally-produced apps have mostly been difficult to use and of a poor educational quality mostly focusing on vocabulary knowledge. They may have a small beneficial effect on national exam scores". For the projects chosen in Figure 6, it appears that the user's choices were wise since, in Figure 7, eight of the nine criteria have improved. The criteria showing the greatest improvement here concern inequalities between schools in Bangkok and upcountry, while the projects chosen in this case have had little impact on general English proficiency in Thailand. The summary of impacts in Figure 7 provides feedback to users on their choices and may encourage them to revise their decisions so that their choices more clearly meet their intended goals.

My Budget	Costs	
STARTING BUDGET	2,000 Million baht	
Introduce a school buddy system whereby teachers are swapped between underperforming schools and highly rated schools	- 50 Million baht	Remove
Employ a marginal native English speaking teacher (i.e. a teacher from the Philippines, Malaysia, Kenya etc.) at all 3,000 government secondary schools	- 820 Million baht	Remove
Short-term training: 10,000 upcountry teachers; local universities + Web support following training	- 230 Million baht	Remove
Increase the amount of English on mainstream TV (e.g. adding English subtitles to local soap operas)	- 400 Million baht	Remove
Provide English language learning opportunities for non-Thai citizens (e.g. children of Burmese migrant workers, some hilltribe children)	- 350 Million baht	Remove
Change the ONET exams so that they include semi-open items (e.g. gap-fill questions, sequencing questions)	- 100 Million baht	Remove
Employ local sources to create online apps for English learning	- 40 Million baht	Remove
REMAINING BUDGET	10 Million baht	

Figure 6 *Project summary in MinEd Game*

Criterion	Current	Change	After Project
Overall education quality	51	5	56[1]
English First EPI score	45	1	46[2]
Average TOEFL iBT score	76	1	77[3]
ONET M6 average score for English	28	3	31
ONET M6 average score for English from Bangkok	38	2	40
ONET M6 average score for English from upcountry	26	4	30
Level of equality in education comparing Bangkok and upcountry	68	14	82
Level of equality in education comparing the top 200 schools and the bottom 200 schools	40	19	59
Secondary school enrollment rate (%)	78	0	78[4]

Overall, your projects have resulted in a 10.96% improvement in Thai education.

[1] Your projects have raised the Overall education quality ranking of Thailand from 78th in the world to 61st in the world.

[2] Your projects have not changed the EF EPI score from Low.

[3] Your projects have raised the TOEFL iBT ranking of Thailand from 115th in the world to 112th in the world.

[4] Your projects have not changed the enrollment rate ranking of Thailand from 94th in the world.

Figure 7 *Results in MinEd Game*

Preliminary results from MinEd Game

To give an idea of what secondary ELT policy projects the public might favour, in this section I will present preliminary results from the first 300 users of MinEd Game. On completing the website, MinEd Game was promoted through multiple channels with the goal of collecting data from a wide cross-section of interested parties with no particular group over-represented. The first 300 users represent a cross-section of stakeholders and other interested parties and include students, teachers, Thais, and non-Thais living in both Thailand and abroad. These respondents were self-selected with most being involved in education.

The MinEd game program collects data on the projects each user chooses in their final selection of projects (in effect, the information shown in Figure 6 for each respondent). This allows us to count the number of users choosing each project. From this, we can calculate the percentage of users who choose to include each project in their final selection.

The MinEd Game website also asks users to supply some basic demographic data (such as whether they are a teacher, a student, or someone not directly involved in education). Matching this demographic data with the project choices allows us to compare the project choices made by different groups of users (e.g. teachers and students). To see if different groups of users favoured different projects, z-scores were calculated with a significance level of $p < 0.05$ showing a notable difference in preferences.

Table 1 lists the ten most frequently chosen projects with the percentages of respondents who chose each project. Each project can be categorised in terms of its impact on the criteria shown in Figure 3 into three categories: projects influencing general education performance, projects influencing English proficiency, and projects reducing inequalities in the education system. In Table 1, it is noticeable that the two most frequently chosen projects both focus on reducing inequalities, but favoured projects overall tend to focus on improving English proficiency.

Table 1 Ten most popular projects

Project	% of users
Introduce a school buddy system whereby teachers are swapped between underperforming schools and highly rated schools	59.67
Introduce a school quality assurance system which aims to identify and increase the budget for underperforming schools	44.00
Increase the amount of English on mainstream TV (e.g. adding English subtitles to local soap operas)	40.67
Evaluation and monitoring of the performance of the trainees (after attending teacher training)	38.00
Teacher training conducted by an international organization (e.g. the British Council)	38.00
Employ local sources to create online apps for English learning	35.67
Change the ONET exams so that they include semi-open items (e.g. gap-fill questions, sequencing questions)	34.67
Change the ONET exams so that they include open items (e.g. essays)	34.00
Teacher training conducted by local universities	33.67

Medium-term (200 hours) teacher training	31.67

Comparing the choices of different groups of users, projects chosen by students significantly more frequently than by teachers are employing a native English speaker teacher at all schools ($z = 2.76$; $p < 0.01$) and providing short-term training for teachers ($z = 2.60$; $p < 0.05$). Projects chosen more frequently by teachers are the school buddy system ($z = 2.83$; $p < 0.01$), changing the national exams to include semi-open items ($z = 2.59$; $p < 0.05$), and providing web support for teachers ($z = 2.54$; $p < 0.05$). Comparing the choices between Thais and non-Thais, the only significant difference is that non-Thais more frequently chose a project focusing on providing English language learning opportunities for non-Thai citizens, such as the children of Burmese migrant workers ($z = 3.00$; $p < 0.01$).

Validating the use of a simulation to elicit public input

Given that using a simulation like MinEd Game to elicit public input into policy is an innovative and largely untested method, we need to examine users' responses to see if the simulation elicits valid responses that account for the issues of complexity and budget constraints.

Whether the simulation elicits considered decisions that reflect intentions to improve Thai education can be evaluated by looking at two possible projects: increasing teachers' salaries by 1,000 baht per month and increasing teachers' salaries by 2,000 baht per month. Given the number of teachers, these are very costly projects with little likelihood of improving education. If users who are teachers were choosing projects based on self-interest, we would expect these to be popular projects despite their unclear benefits. In fact, only 10.91% of teacher respondents chose the 1,000 baht salary increase and only 3.64% chose the 2,000 baht increase. These low figures suggest that users are not responding based on self-interest.

One argument for using a simulation to elicit public input rather than a more traditional survey is that simulations account for the complexity of policy decisions. One way of investigating whether this is true is to examine users' decisions on similar expensive projects. For example, some people believe that it is useful to have non-Thais teaching English in Thailand since this provides a motivation for students to use English. In MinEd Game, there are two projects that fulfill this goal: employ a native English speaking teacher (i.e. a teacher from the UK, the US, Canada, etc.) at all 3,000 government secondary schools, and employ a marginal native English speaking teacher (i.e. a teacher from the Philippines, Malaysia, Kenya, etc.) at all 3,000 government secondary schools. Both projects are expensive and, if chosen, account for a substantial proportion of the available budget. In a survey, a respondent who believes in the benefits of employing non-Thai teachers would rate both projects highly, implying that both should be run. In MinEd game, however, users chose one or the other – no-one chose both projects. Although separately, these two projects do not appear in the top ten most popular projects in Table 1, their combined frequency is 47% which would place them as the second most popular project. It, therefore, appears to be the case that having non-Thai teachers is fairly popular, but that users are aware that choosing both projects is a poor way to use the available budget, suggesting that at least some of the complexity of policymaking is being considered in users' decisions.

A second way of seeing if the simulation accounts for complexity is to look at the mix of projects that users choose. As noted above, projects can be categorised in terms of their main impacts into three categories: improving education generally, improving English, and reducing inequalities. While some users may have strong beliefs about the overriding importance of one of these goals, it seems likely that most users will aim for a more balanced approach. Indeed, 76% of users chose mixed goals by assigning at least 20% of their budget to each of at least two goals, suggesting an awareness of the need for balancing priorities.

A further proposed benefit of using a simulation concerns awareness of budget constraints. Although the simulation limits the budget by default, users are allowed to overspend by taking money from other Ministry of Education funds previously allocated to provide subsidies for other purposes. Doing this has negative consequences, but the benefits accruing to new projects may outweigh the detriments of reducing existing projects. Around a quarter of users took the opportunity to increase their available budget and most of these were judicious in doing so. It, therefore, appears that users show an awareness of budget constraints.

These four validity checks (checking that the responses are not based on self-interest, not choosing two similar projects, balancing choices, and using the budget judiciously) suggest that an online simulation is a valid instrument for eliciting public input into educational policy decision making. The MinEd Game website also includes a page for users to post comments, and some comments provide further support for some of the potential advantages I have suggested for using simulations. For example, using the simulation raised users' awareness of the importance of public input into the policy ("It reminded me that the Minister of Education should listen to our or our students' voices more than their own ideas"); it raised awareness of policy issues in general ("This game made me realize how to improve education, especially English, and how to manage or use the budget"); and it improved knowledge of policy projects ("Overall, this game explains the impacts of the various projects really well").

However, the fact that the MinEd Game appears valid does not mean that the findings shown in Table 1 are representative of Thai public opinion since the data collected has some limitations. First, 300 respondents is not a large sample size. Although statistically, 384 respondents is sufficient to represent the population, this is only the case if sampling is random. For MinEd Game, the simulation was promoted through websites and electronic communications aimed at those interested in issues concerning Thai education such as teachers. The sampling was therefore biased towards a certain sector of the general public. Second, as with most web-based surveys, for MinEd Game respondents are self-selected. In other words, respondents choose to complete the simulation, and this may also mean that sampling is biased. The figures reported in Table 1, then, should not be taken as representative of the Thai general public; rather, they are preliminary results allowing us to gain some initial insights and to validate the use of a simulation.

Conclusion

The goal of the MinEd Game is to elicit meaningful public input into ELT policy in Thailand to overcome the weaknesses of the current insider-dominated decision making, such as pushing

personal pet projects and prioritising face over substance. By using a web-based simulation like MinEd Game, the drawbacks of traditional methods such as surveys and focus groups can be avoided. The preliminary findings reported here suggest that using a simulation accounts for the complexity and budget constraints inherent in policymaking. From the initial responses, it appears that the public favours projects that promote English proficiency and reduce inequalities over those that focus on the quality of education generally. It is hoped that, with further promotion, MinEd Game will attract enough users that the results will be convincing enough to persuade the insiders at the Ministry of Education to take them into account in their decision making. As one user put it in the comments section, "If the Minister of Education learned about the game and used the responses in his real decision making especially for English, this would improve the quality of education above that at present. Should be a really good result".

References

Ansell, G. & Gash, A. (2008) Collaborative governance in theory and practice. *Journal of Public Administration Research and Theory 18*, 543-571. Doi: 10.1093/jopart/mum032

Atagi, R. (2011) *Secondary Teacher Policy Research in Asia: Secondary Teachers in Thailand*. Bangkok: UNESCO.

Ben-Nun, P. (2008) Respondent fatigue. In Lavrakas, P.J. (ed.) *Encyclopedia of Survey Research Methods* (pp. 743-744). Thousand Oaks, CA: Sage. Doi: 10.4135/9781412963947.n480

Bown, K., Sumsion, J. & Press, F. (2009) Influences of politicians' decision making for early childhood education and care policy: What do we know? What don't we know? *Contemporary Issues in Early Childhood 10*(3), 194-217. Doi: 10.2304/ciec.2009.10.3.194

Fishkin, J. S., Luskin, R. C. & Jowell, R. (2000) Deliberative polling and public consultation. *Parliamentary Affairs 53*, 657-666.

Keck, C. M., Iberri-Shea, G., Tracy-Ventura, N. & Wa-Mbaleka, S. (2006) Investigating the empirical link between task-based interaction and acquisition: A meta-analysis. In Norris, J. M. & Ortega, L. (eds.) *Synthesizing Research on Language Learning and Teaching* (pp. 91-132). Amsterdam: John Benjamins.

Keeney, R. L., von Winterfeldt, D. & Eppel, T. (1990) Eliciting public values for complex policy decisions. *Management Science 36*(9), 1011-1030. Doi: 10.1287/mnsc.36.9.1011

Landwehr, P., Spraragen, M., Ranganathan, B., Carley, K. M. & Zyda, M. (2013) Games, social simulations, and data – Integration for policy decisions: The Sudan game. *Simulation and Gaming 44*(1), 151-177. Doi: 10.1177/1046878112456253

Niskanen, W. A. (1986) Economists and politicians. *Journal of Policy Analysis and Management 5*(2), 234-244. Doi: 10.2307/3323543

Plonsky, L. (2011) The effectiveness of second language strategy instruction: A meta-analysis. *Language Learning 61*(4), 993-1038.

Rosekrans, K. (2006) Using participatory research and informed dialogue to influence education policy: Lessons from El Salvador. *Journal of Education for International Development 2*(2).

UNESCO (2016) *Education in Thailand: An OECD-UNESCO Perspective, Reviews of National Policies for Education*. Paris: OECD Publishing.

von Ahn, L. (2006) Games with a purpose. *Computer 39*(6), 92-94. Doi: 10.1109/MC.2006.196

Walters, L. C., Aydelotte, J. & Miller, J. 2000 Putting more public in policy analysis. *Public Administration Review 60*(4), 349-359.

Watson Todd, R. (2015) National-level educational innovations in Thailand. In Darasawang, P. and Reinders, H. (eds.) *Innovation in Language Learning and Teaching: The Case of Thailand* (pp. 15-28). Basingstoke: Palgrave Macmillan.

Watson Todd, R., Pojanapunya, P., Lieungnapar, A. & Poonpon, K. (2018) Applied linguistics research from Thailand: Quantity, quality and societal needs. Paper presented at the *CULI International Research Seminar 2018*, Bangkok.