

**Building research capacity for systematic reviews in the Asian and African
communication policy research communities**

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2. Executive summary

Project Components: The project consisted of three components; research, capacity building and dissemination. The research component consisted of conducting systematic reviews (SRs) on topics related to development. The capacity-building component was aimed at training a select group of mid-level and senior policy intellectuals on how to conduct SRs. The dissemination component communicated the results to a larger group of policy intellectuals through events including the Communications Policy Research South (CPRsouth) conference and other events, making use of policy windows where appropriate.

The purpose of a SR is to screen, synthesize and summarize the best available primary research on a specific research question. Three teams focused on the following three topics:

1. What are the impacts of mobile financial services on low and lower-middle income countries?
2. Strategies for training teachers to integrate ICT in the classroom: A systematic review
3. How does access to business relevant information through networked devices enhance the business growth of urban MSMEs in low and lower-middle income countries?

A competitive selection process screened and selected a group of researchers and trained them SR. The teams to conduct the SRs were then selected through this training course. These teams were involved in conducting the SRs. Research managers and Research Fellows of LIRNEasia coordinated and lead the above-mentioned teams. The SRs were registered EPP (Evidence for Policy and Practice Information and Coordinating Centre); the protocols for conducting the SRs were completed and approved by EPPI; the SRs were then completed and the final reports drafted; the reports have undergone several rounds of reviews by external reviewers (as per EPPI's requirements); the finally approved protocols were then sent for copyediting. One report has gone for publishing, while the others are to be published within the first quarter of 2017. The approved protocols and the latest versions of the reports can be found in annexes 1-3 and 13-15 respectively. LIRNEasia negotiated a special issue on SRs in the open access, peer reviewed journal, Information Technologies and International Development (ITID). The three SRs conducted under this project, along with a previously conducted SR and an overarching chapter are to be published in this special issue. A writing workshop for the authors of the papers took place in March 2016 in Galle, Sri Lanka. The special issue is expected to be published in 2017

Geographically diffused teams conducted all three SRs. This presented an added complexity to the project, especially with the project coordination component. At the time of commissioning the reviews, the focus was on synthesizing quantitative studies, predominantly experimental and quasi-experimental. However, this has changed over time, with the organizations such as the Campbell Collaboration and the Evidence for Policy and Practice Information and Coordinating Centre (EPPI-Centre) that provide guidelines for conducting SRs and providing peer review processes for SR now having provisions for qualitative reviews. But as it happens, the three SRs conducted by LIRNEasia ended up with papers that required only quantitative synthesis methods. As such, no additional training was required apart from what was planned and delivered through the project so far. This is an important point to note for future SRs, which (like this one) may use novice teams and therefore have a significant capacity building component.

Findings of the SRs: The electronic search for the SR titled "The impact of mobile financial services in low- and lower middle-income countries" at 2,759 documents. After additional results from grey literature searches and screening through for inclusion criteria and quality, the team finalized 10

studies for the final synthesis. The findings demonstrated significantly higher volumes of remittances received among m-financial service users compared to non-users. Mobile money (M-money) as an intervention also leads to greater savings, although the overall difference is not statistically significant. It should be noted that a majority of the papers were based on African experiences, with 60 percent of the studies being on Kenya's m-Pesa.

A search of the academic literature brought out a total of 11,419 for "Strategies for training teachers to integrate ICT in the classroom: A systematic review". Significant volumes of studies were rejected as they did not focus on ICT use in the classroom (only education) or because the focus of the studies was tertiary and vocational training as opposed to K-12 education. 64 studies were selected for critical appraisal and of those 8 studies were selected for synthesis as those were based on the unified theory of acceptance and use of technology (UTAUT) or related theories where teacher attributes are well-defined and comparable across the studies. The UTAUT included perceptions about the usefulness and the ease of use, respectively, of the technology concerned. The findings showed that perceived usefulness can be two times as effective as ease of use in predicting the technology use by teachers.

The SR titled "Does access to business relevant information through networked devices enhance the business growth of the urban MSMEs in low and middle income countries?" had the most number of studies to screen through (24,204). Through the course of the search process, the team realized that a number of studies originated from the field of information systems. These include studies examining the impact of implementing small-scale information systems by small enterprises with the aid of networked devices. Studies originating from information systems are often ignored by ICTD practitioners when examining literature. 192 studies were selected for a full text review. However, upon completion of critical appraisal, only seven studies met the required quality parameters. The quantitative meta-analysis showed that the impact on business growth and the internal efficiency was positive, but small. The review highlighted that the research field lacks adequate rigorous causal studies that link Information and Communication Technology (ICTs) and growth of Micro, Small and Medium Enterprises (MSMEs).

Capacity Building and CPRsouth: The researchers involved in the SRs received 2 rounds of training – first on how to conduct SRs and second on how to use quantitative methods to synthesize findings. Apart from these, the methodology of SRs was taught/effectively disseminated to young scholars through multiple forums. SRs (as a methodology, as well as early results of the three SRs themselves) were featured heavily at the CPRsouth conference and tutorials held in Johannesburg, South Africa in September 2014 for an audience consisting of a broad group of policy intellectuals and young scholars interested in policy influence. SRs were also the focal point at an event at CPRsouth 2016 in Zanzibar, Tanzania, where the findings of all three SRs, along with the difficulties of taking the research to policymakers were discussed.

In addition, participants at 4 separate courses on 'how to engage in broadband policy and regulatory processes' funded by the Ford Foundation were taught how to adopt an SR methodology to improve rigor of research in April 2013, March 2014, March 2015 and September 2015 in Bangalore India, Gurgaon India, Nagarkot Nepal and Marawila Sri Lanka respectively.

Dissemination of Results: In addition to the dissemination of research results at CPRsouth and other capacity building events, LIRNEasia organized a number of events to share the results with policymakers and practitioners. The results of the "Strategies for training teachers to integrate ICT in the classroom: A systematic review" were disseminated in Sri Lanka to stakeholders including

government officials and telecommunications service providers. The results of the SR titled “Does access to business relevant information through networked devices enhance the business growth of the urban MSMEs in low and middle income countries?” were disseminated to government officials and MSME experts in Delhi, India and Colombo, Sri Lanka. The findings of the SR titled “What are the impacts of mobile financial services on low and lower-middle income countries?” were shared in Quezon City, Philippines, at an event attended by representatives from local and non-governmental organizations. The results were also used at the launch of the World Bank’s 2016 World Development Report (focused on the Digital Divide), in Ottawa, Canada at an event organized by IDRC and the Aga Khan Foundation in March 2016. The research also provided the basis of evidence at LIRNEasia’s presentation at the 19th session of the UN CSTD (Commission on Science Technology and Development) in Geneva, Switzerland in May 2016 and at the Digital Citizen Summit in Bangalore, India in October 2016. Results were also used in several interventions made by LIRNEasia at panels/workshops at the UN IGF (Internet Governance Forum) in Guadalajara, Mexico in December 2016.

SR as tool for policy intervention: Most of the time, when a policy window opens, researchers need to have the results ready to take to policy makers. Even though SRs can provide rigorous evidence, the lead-time required to conduct a SR reduces the chances of it being used in a policy. Even if a SR is done and ready by the time a policy window opens, it’s likely to be a synthesis of older studies, while policy makers are likely prefer the newest results.

3. The research problem

The high level objective of the project was to build capacity among members the Communication Research Policy community in Asia and Africa to produce and disseminate systematic reviews and to consolidate knowledge on the role of digital technologies in various development policy questions. In carrying out the project, conducting research and engaging in capacity building often went hand in hand.

3.1 Systematic Reviews

The purpose of a SR is to synthesize and summarize the best available primary research on a specific research question. The SR method originated in the field of medicine where a need arose to systematically bring together the available evidence, particularly of clinical trials. Since then, other fields including social science have begun to adopt the methodology. The primary studies included in a SR are selected using pre-determined inclusion criteria appropriate for the research question. In order to be included in a SR, the studies have to clearly demonstrate the impact and causality pertaining to the specific intervention/s identified in the research question.

The research component of the project consisted of conducting three SRs. The context of the research questions are outlined below.

3.1.1 *The Impact of mobile financial services on low- and lower middle-income countries (LMICs)*

Available literature posits that access to financial services is important for development as it facilitates economic growth and helps reduce income inequality. For the poor, inclusive financial systems can lead to smoothening of consumption and insuring themselves against economic vulnerabilities. This can allow them to save and borrow, build their assets, and make investments that can improve their livelihoods.

However, half of the world is unbanked, and do not use formal financial services to save and borrow. Given the rapid access to and ubiquity of mobile phones in developing countries, there has been considerable excitement and subsequent investment in using mobile phones as a conduit for reaching the unbanked through the development mobile phone based financial services.

Among the foreseen benefits of using mobile financial services is the ability to transfer funds at a distance, particularly small amounts of money, at a lesser cost compared to other alternatives available to the poor. Moreover, it is also hypothesized that provision of mobile financial services to the unbanked may lead to better savings rates, increased income and resilience to financial shocks, among others.

Given the rapid expansion and high level of attention mobile financial services are garnering, this research examined the impact it has made on development. The primary objective of the review was to assess and integrate the empirical evidence on the socio-economic impact of mobile financial services on individuals, households and communities in low and lower middle-income countries.

For definitional purposes, mobile financial services cover a broad range of financial activities that people use or access through their mobile phones. These include mobile banking services (m-banking), and mobile money (m-money) using money transfers and payment.

The approved protocol is given in annex 1. It discusses how the different elements in the research question are connected and what the possible pathways to outcomes are.

3.1.2 Strategies for Training teachers to integrate ICT in the classroom: A systematic review

The review was previously titled “How have young or adult learners in Developing Asia benefitted from ICTs?” However, this was revised to “Strategies for training teachers to integrate ICT in the classroom: A systematic review”. The change in the review questions was made due to gaps identified during the protocol stage.

Promise of ICT for basic education is of much interest from a development perspective since basic education completion is widely accepted as a necessary condition for development (UNESCO). Successful integration of ICT into the teaching-learning process is largely viewed from student performance perspective. Cheung and Slavin’s (2013) work, for example, represents the kind of comprehensive SRs available from a student performance perspective.

However, parallel to the student performance approach, a teacher competency and performance perspective, where the teachers’ efficacy and beliefs are seen as critical, too has developed. To our knowledge no SR had been done on the teacher dimension in integrating ICT in education. Therefore the SR examined the impacts of, or lack thereof, training of teachers for ICT integration in education in both developed and developing countries with the view of informing the policy process in developing countries.

The review questions are as follows:

- What strategies are used to train and/or support teachers to integrate ICT in the classroom?
- What are the measures of integration?

The approved protocol is given in annex 2 and provides how the various elements of the research questions relate to each other as well as possible pathways from input to outcomes.

3.1.3 Does access to business relevant information through networked devices enhance the business growth of the urban MSMEs in LMICs?

MSMEs offer a broad range of employment opportunities and play an important role in reducing urban poverty. The studies of ICTs in this space are moving from capturing adoption to understanding impact.

The studies are conclusive about the level of adoption of ICTs by MSMEs with mobile phones being the most popular form of ICT. However, the studies on the impact of ICTs, especially in the growth of MSMEs seem to be unclear. With rise of networking capabilities, through Internet, of low cost technologies like mobile phones, questions are being asked whether these networked technologies are resulting in overall economic growth, at least for the MSMEs.

Some of the most commonly used indicators to assess MSMEs growth include: time saving, increase in sales, turnover, number of employees, branches, customers, suppliers, work locations, partnerships, products, services, business networks, and incoming referrals, diversification into new areas of business, products & services, and inventory management among others.

The review aimed to examine the following:

- What is the role played by ICTs in the relation between information access and business growth for MSMEs in the LMICs?
- How is the causal relationship between business relevant information and business growth mediated by ICTs, especially the networked devices?
- Are the differential impacts of ICTs in this causal relationship, if any, due to extraneous factors like policy environment, characteristics of MSMEs and owners, gender and national specific cultural factors.
- What are the outcomes emerging from a sub-groups comparison between personal vs non-personal networked devices, male vs. female owned MSMEs, micro vs. small and medium enterprises, and Asian vs. African countries etc.

The approved draft protocol is given in annex 3

3.2 CPRsouth

In addition to conducting the SRs, the capacity building activities (in formal capacity building tutorials and workshops, as well as through the practice of participating in the conducting of the 3 SRs) are part of a larger research problem LIRNEasia has been attempting to address – how to facilitate the creation, sustenance and continuous advancement of policy intellectuals capable of making interventions in ICT policy and regulation in the South.

The *CPRsouth* community consists of several hundred policy-oriented researchers. The community was developed through a series of eleven conferences and Young Scholar training programs funded by IDRC under grants 106333-001, 103017-001 and 104918-001 since 2006. A 25-member board comprising senior policy intellectuals governs it. LIRNEasia functioned as its administrative partner up to 2014, after which it was given over to Research ICT Africa (RIA) for two years. CPRsouth has since been handed over to LIRNEasia once again.

Its objective is to facilitate the creation, sustenance and continuous advancement of policy intellectuals capable of informed and effective intervention in ICT policy and regulation processes in

specific country and regional contexts in the south. In order to fulfill its objectives, CPRsouth targets aspiring junior and mid-level policy intellectuals in Asia-Pacific. Since its inception, the conferences have focused on giving the participants training in engaging in the policy process. The conference participants are mentored on doing good policy-relevant research and effectively communicating the research to the appropriate audiences.

The Young Scholar program focuses on training junior scholars or entry to mid-level personnel in regulatory agencies, other government departments and the private sector. The topics taught include quantitative and qualitative research, effective communication and legal analysis. The intention is to prepare scholars below 35 to engage in policy relevant research effectively and possibly also use CPRsouth as their community and support platform.

4. Progress towards milestones

Four milestones centered on research, capacity building and dissemination were set out at the project's inception. The progress made on each milestone is as follows:

4.1 Develop capacity among members of the CPRsouth community to conduct SRs

The members of the SR teams were chosen following a call for applications sent via the CPRsouth network. 31 researchers, all of whom were novice reviewers, participated in a workshop on SRs and reported knowledge increases following the course on multiple aspects of conducting a review. (See Annex 6, Figure 1) As the teams progressed with SR process, it was clear that the studies that were screened and selected for final review were all experimental or quasi-experimental studies. As such a subsequent training on quantitative synthesis was held. The teams used this knowledge to carry out SRs. When the SRs were nearing conclusion, a writing workshop was held to prepare for the publication of a special issue on SRs in the ITID journal.

CPRsouth was twice used as a platform to share knowledge on conducting SRs, their results and policy implications amongst the wider CPRsouth community. The infusion of SR knowledge into the CPRsouth community is expected to improve the rigor of the research generated by CPRsouth members, even if all may not be a part of a team carrying out a SR.

CPRsouth 2014 in Johannesburg, South Africa had a panel discussion on the SR process and its pros and cons as a useful tool in research and the funding of research, in addition to the tutorials and the presentations on the progress (results) of the SRs themselves. The discussion was polarized with a considerable portion of the audience questioning and criticizing what they thought saw as over-reliance on quantitative methods. The discussion progressed on to discuss on the rigor of various study methods, both quantitative and qualitative. The need for identifying appropriate questions for SRs was also discussed.

SRs were discussed once again at CPRsouth 2016 in Zanzibar, Tanzania, with the results of the three final reviews and their policy implications being presented. Challenges in taking research to policy were discussed, including the need for an opening of a policy window, the large amount of time needed to carry an SR and the lack of country specific data. A panel discussion on the took place on whether the SRs were providing useful results or if the real issue was how the policy questions were framed. Concerns on the use of only quantitative reports was discussed, with members of the audience asking about the possibility of incorporating qualitative reports into the reviews. Extensive debate ensued on the concept of 'SR-lite'.

4.2 Conduct four SRs on digital technologies topics relevant to development policy

Three SRs were conducted on the following topics:

1. What are the impacts of mobile financial services on low and lower-middle income countries?
2. What are the strategies for training teachers to integrate ICT in the classroom?
3. How does access to business relevant information through networked devices enhance the business growth of urban MSMEs in low and lower-middle income countries?

The fourth SR on telecommunications was not completed due to time commitments of the team which prevented them from completing the review. Funds were reallocated towards other activities.

4.3 Draw policy recommendations stemming from the reviews and communicate relevant evidence to policy makers and practitioners

Policy recommendations were drawn from the three reviews. LIRNEasia has organized 4 events across three countries to disseminate the results to policymakers and those immersed in the relevant fields. Results were also shared at CPRsouth and were the base of LIRNEasia's presentation at a launch of the World Bank's World Development Report and the 19th session of the UNCSTD. Results were also used in several interventions at the UN IGF in 2016 and the Digital Citizen Summit in 2016. Deputy Minister of Foreign Affairs in Sri Lanka, Harsha De Silva, PhD spoke of the MSME research at a Committee Stage Discussion in December 2016. (See Annex 21; p3786)

While the results were shared with policy makers and some uptake has been seen, some concerns have been noted regarding the ability of SRs to influence policy (See section 8: Problems and challenges)

4.4 Identify gaps in existing literature to inform future research

Gaps in the literature have been identified and been recorded in the reports were sent to the Evidence for Policy and Practice Information and Coordinating Centre (EPPI-Centre), which is part of the Social Science Research Unit at the Institute of Education, University of London, for peer review. The SRs on mobile financial services and MSMEs are undergoing the final stages of review following copyediting. The SR on ICTs in the classroom has been copyedited and sent for publishing. The EPPI-Center has stated that if no further design changes need to be made, this report will be published by end January 2017. The other two reports are expected to be published within the first quarter of 2017.

The three SR, along with another SR conducted by LIRNEasia and an overarching chapter are to be published in a special issue journal in ITID.

5. Synthesis of research results and development outcomes

5.1 Develop capacity among members of the CPRsouth community to conduct SRs

The call for applications to conduct the SR was sent through the LIRNEasia and CPR communities that span Asia and Africa. A total of 163 applications were received from 32 countries for both the statistician and researcher positions. 46% of the applicants were female. Given the level of high interest, LIRNEasia had a variety of applicants to pick from for the training programme. 31 applicants were selected for the training, 17 of these (55%) were female. (See annex 4)

The training course was organised from 18-20 October 2014 in Wadduwa, Sri Lanka. Hilary Thomson, PhD, conducted the training. Hilary is a Senior Investigator Scientist of the Social and Public Health Sciences Unit, Medical Research Council, Glasgow, United Kingdom. Given that the participants had limited exposure to systematic reviews, the training course focused on the following topics:

- ☐ Principles & rationale for systematic review
- ☐ Searching & Identifying literature
- ☐ Screening & screening literature
- ☐ Study designs & best available evidence
- ☐ Assessing study quality and critical appraisal
- ☐ Data extraction/coding and management
- ☐ Use of logic models
- ☐ Principles of synthesis
- ☐ Synthesizing qualitative data

The course evaluations showed that the about 75 percent of the participants were ready to start a SR but with some specialist support. A majority of the participants had little understanding of the SRs prior to the training, however this changed after the training. (See annexes 5 and 6 for the final program and course report)

The workshop on quantitative synthesis techniques, the second training programme, was held from 25-27 April 2014. Jorge Hombrados (previously of J-PAL) conducted this training. It focused on giving the teams extensive, hands on training. The topics covered were:

- Assessment of risk of bias
- Effect size calculation
- Synthesis of the quantitative studies

The training was limited to the team leaders, statisticians and senior researchers on each team. As the training was limited to 12 team members, the participants were able to engage with the lecturer and the material more effectively. Much of the course consisted of group work where the teams were required to critically assessed and synthesize various studies. The studies were circulated prior to the training course as required reading. The course evaluations were extremely positive. (See annex 7)

The training courses, along with the process of carrying out the SR led to significant capacity building of the team members, all of whom were novice reviewers. SRs by nature are methods intensive. As such, all 20 team members received a considerable amount of capacity building with regards to the research methods, particularly those that were involved in the critical appraisal stage. Apart from the two training courses, the review teams were also given the opportunity to interact with statistical expert Jorge Hombrados to through email and Skype for guidance during the synthesis stage. The three statisticians received extensive training on statistical methods and synthesis throughout the

review process. Two of the statisticians were competent to begin with while the third required more training during the review process.

Following the completion of the SR, a writing workshop was conducted on 19 and 20 March 2016 at Tamarind Hill, Galle, Sri Lanka. This was held for the editor, lead and co-authors to come together and work on the initial drafts of the papers to be published in a special issue on SRs in the ITID journal. The authors prepared slides on the contents of their papers and presented it to the other participants. Hour long discussions followed each presentation, allowing the contents of the papers to be refined. A session on difficulties of taking SRs to policymakers followed. (See annex 8)

Knowledge gained on SRs were also shared more broadly among the CPRsouth community. The ninth CPRsouth conference (CPRsouth2014) and tutorials were held from 10-12 and 7-9 September 2014 respectively, in Cradle of Humankind, South Africa with the theme “What works, why and how do we know?” In line with the theme, both the conference and the tutorials had a special focus on SRs.

The conference featured 21 papers that were selected in a competitive process. The focus of these papers was on communication policy research in relation to Asia and Africa. The SRs were presented at the conference in addition to the papers that were selected in a competitive selection process. The conference also featured a panel discussion that reviewed the SR process and its strengths and weaknesses. The discussion was polarized with a considerable portion of the audience questioning and criticizing what they thought saw as over-reliance on quantitative methods. The session brought about a heated debate about the quantitative and qualitative research methods. Questions were raised about the validity of Randomized Controlled Trials (RCTs) in social sciences as well as strength of reporting of qualitative research. The validity of SRs was also questioned and the need for identifying appropriate questions for SRs was also discussed.

In addition to the conference, tutorials were conducted for 28 young scholars representing Asia and Africa. The tutorials contained five sessions on SR including the principles and rationale for SRs, logic models and how to conduct an effective search.

The Young Scholar Tutorials also dedicated one day to introducing the SR methodology to aspiring policy intellectuals. The SR tutorials covered the following, among others; rationales for SRs, the use of log frames, searching for relevant literature and best available evidence and synthesis. Apart from the above, topics such as policy analysis through demand-side research and how big is big data were also covered. The young scholars also benefitted from the senior scholars and policy intellectuals speaking about their experiences in communicating research for policy influence. The complete tutorial agenda and the full list of tutorial and paper presenters are given in annexes 9 and 10 respectively. The young scholars were also given the opportunity to take part in the conference. (See annexes 9-11)

SRs were also discussed at CPRsouth two years later, on 10 September 2016 in Zanzibar, Tanzania. 58 participants (27 from Africa and 21 from Asia) from 24 countries were present at the half-day session on SRs. The speakers, those who had conducted the SRs, spoke of the methods used and results of each review. The methodologies used were discussed for the benefit of the participants. Problems in taking research to policy were discussed at length. This session too resulted in heated debate with a variety of questions being raised by the participants, particularly on the topic of conducting less resource intensive reviews, a ‘lite’ version of the SRs. The session was well received, and following the session, a participant stated ‘I finally understood what Systematic Reviews are about’. (See annex 12)

The use of SR methodologies was taught as the gold standard in methods of analyzing existing literature in capacity building courses. It was taught to participants at a session titled ‘Assessing and summarizing research’ at four separate courses on ‘how to engage in broadband policy and regulatory processes’ funded by the Ford Foundation. Details on the courses are given below:

Table 1: Details of "How to engage in broadband policy and regulatory processes"

Date	Venue	Number of participants
April 2013	Bangalore, India	25
March 2014	Gurgaon, India	30
March 2015	Nagarkot, Nepal	25
September 2015	Marawila, Sri Lanka	18
Total		98

Members of civil society groups who participated at a course on “Policy and regulation conducive to rapid ICT sector growth in Myanmar” in Taungoo, Myanmar in September/October 2013 were also taught SR procedures in a session titled ‘Finding Information on the web’.

Vigneshwara Ilavarasan also presented the findings of SR on ICTs and MSMEs at the United Nations University, Macau on 23 May 2016. Noteworthy is the fact that it was the university’s first encounter with SRs.

5.2 Conduct four SRs on digital technologies topics relevant to development policy

Three SRs pertaining mobile financial services, integration of technologies in classrooms by teachers and use of networked devices for business growth and efficiency was conducted.. The results of the three SRs can be summarized as follows:

5.2.1 What are the impacts of mobile financial services on low and lower-middle income countries?

A number of studies in Africa have demonstrated that significantly higher volumes of remittances are received by m-financial service users compared to non-users. Overall, m-money use also leads to greater savings, although the overall difference is not statistically significant ($Z=1.81$, $p=0.071$).

In cases where it was used for cash transfers in farm inputs, m-money has been found to be significantly responsible for a 54% increase in farm inputs consumption compared to non-users. In turn, this has also contributed to an increase in household income and farm yield sold.

See annex 13 for the full report

5.2.2 What are the strategies for training teachers to integrate ICT in the classroom?

The evaluation studies show that teacher training along with facilitating conditions, increase technology integration by effect sizes of +0.48 to +1.31 as compared to the control situations with no such facilitation. The two facilitating conditions are OLPC and on-site coaches.

Secondly, the exploration studies show that the perceptions of usefulness (PU) are twice as important as perceptions of the ease of use (PEoU) of a technology. Due to the lack of studies, we are not able to show how PU, for example, compares with the effects of peer influence or facilitating conditions.

See annex 14 for the full report

5.2.3 How does access to business relevant information through networked devices enhance the business growth of urban MSMEs in low and lower-middle income countries?

The overall impact of networked devices on business growth and internal efficiency combined is modest with effect size of 0.060 (SE = 0.028) with a confidence interval (-0.492, 0.612). In other words, impact of networked devices is limited. Impact on internal efficiency is relatively stronger than on business growth.

A meta-analysis focusing on the type of the networked devices used by the MSMEs to relay business relevant information (use of mobile phones, use of mobile phones plus other devices, and devices unclear) was conducted. Effect size was highest in the one study that did not specify the device (1.128).

See annex 15 for the full report

5.3 Draw policy recommendations stemming from the reviews and communicate relevant evidence to policy makers and practitioners

5.3.1 Policy recommendations

Policy recommendations from the findings of the three SRs were identified and communicated to policymakers and other practitioners at various forums including LIRNEasia organized events and conferences. The policy recommendations on each SR at the different forums can be summarized as below.

5.3.1.1 What are the impacts of mobile financial services on low and lower-middle income countries?

In terms of cash transfers in general, the emerging evidence is promising. In places such as Kenya where the m-money ecosystem is well developed, there is evidence that the frequency and volume of remittances is higher for m-money users. Evidence suggests that use of m-money leads to greater savings, although the difference varies across studies and is not statistically significant overall. The evidence on how these transfers are used is encouraging. Because the volume and frequency have increased, there is a smoothening of cash flows and more stable consumption patterns, especially in times of disasters (e.g., drought, earthquakes). Strengthening the m-money ecosystem will help stabilize access of people to needed financial resources. Articulating government outreach programs to these “natural” support systems is likely to yield better developmental outcomes.

5.3.1.2 What are the strategies for training teachers to integrate ICT in the classroom?

In situations where a school board or some authority is seeking to introduce ICT to improve learning outcomes, they are well advised to consider the teachers’ perceptions of usefulness of the technology. If the teachers feel the technology is useful, their perceptions of the ease of use of the technology is less important. This finding is particularly important for developing countries where introducing a new technology may involve a host of other facilitating conditions and training to use the technology. Contextualizing the SR findings to developing countries we may conclude that it is far better to find technologies that one or more teachers have found useful and facilitate the sharing of those experiences. Further, it would be far better to leave it to smaller administrative units to determine the facilitating conditions appropriate for their particular context.

5.3.1.3. How does access to business relevant information through networked devices enhance the business growth of urban MSMEs in low and lower-middle income countries?

It was found that the impact of networked devices, through which business information is processed, on the business growth of urban MSMEs is statistically small. Business growth of the MSMEs is also determined by other sets of factors in addition to the ICTs, as well demonstrated as a general principle in World Bank (2016). It appears that any ICT driven strategy to strengthen the MSMEs should be coupled with other policy actions.

It may be wise for development practitioners who are promoting ICT-only interventions to contemplate whether to proceed further. Those who are confident about the possible causal linkages should document the same and make the records public. Of course, this applies only to promotional programs, funded by public or private resources. The cautions do not apply to take up of ICTs by MSMEs on their own and with their own resources. Because the effects of ICTs are positive according to the research, government should desist from actions that would depress use such as excessive taxation of ICT services and devices.

5.3.2 LIRNEasia organized events

LIRNEasia organized a number of events including half-day workshops in the home country of the team leaders to disseminate the results to policymakers in their country.

5.3.2.1 What are the impacts of mobile financial services on low and lower-middle income countries?

A dissemination event was held on 17 June 2016 at Microtel Libis, Quezon City, Philippines. The event began with participants from international organizations such as USAID and OXFAM sharing their work with m-money, after which government officials including Noel Adrias, Head of Financial Management of Quezon City Government and Adelia Soriano, City Treasurer of Valenzuela City Local Government the spoke of their experiences and challenges faced. Erwin Alampay then presented the emerging international evidence in the form of the SR and an open forum followed. Different models (bank led vs. operator led) and the different forms of m-money currencies offered by various operators possibly leading to a lack of interoperability were among the concerns of the participants that were discussed

See Annex 16 for the event report

5.3.2.2 What are the strategies for training teachers to integrate ICT in the classroom?

The findings of the SR on strategies for training teachers to integrate ICT in the classroom were disseminated by Sujata Gamage at a half day workshop held on 26 November 2015 in Colombo, Sri Lanka. The event brought together multiple stakeholders to inform them on the research findings, and initiate a dialogue on ICTs in education and possible developments in the sector. Attendees included G.M. Niel Gunadasa, Director IT and Services, Ministry of Education of Sri Lanka and D. Anura Jayalal, Director National Institute of Education, Sri Lanka. It also drew considerable attendance from content service providers and figures that were pivotal in introducing educational platforms via ICTs. Anir Chowdhury from the Access to Information (a2i) unit of the Prime Minister's Office in Bangladesh and Longkai Wu of the National Institute of Education, Singapore, provided insights from their countries.

Sri Lankan efforts to introduce ICTs via education were described by those present. The research was well received and an invigorating discussion on the subject followed. Fundamental questions including the role of ICTs in delivery of education and whether online education was to act as a complement or substitute to traditional education were addressed. Discussion ensued on the question of using ICTs to address disparities in educational opportunities when they themselves were not evenly distributed across society. Suggestions were made by the participants on methods to increase the effectiveness of ICTs as an educational tool.

See Annex 17 for the event report

5.3.2.3 . How does access to business relevant information through networked devices enhance the business growth of urban MSMEs in low and lower-middle income countries?

The results of the SR titled "Does access to business relevant information through networked devices enhance the business growth of the urban MSMEs in low and middle income countries?" were disseminated by Vigneswara Ilavarasan on 26 April 2016 at Indian Institute of Technology (IIT) Delhi, India. Participants included Prateek Jain from the Chamber of Commerce, academia and, private and non-governmental organizations (NGOs) who worked or had experience in working with MSMEs. The findings of the SR were discussed in detail, with participants offering their viewpoints on some inconclusive results found in the SR. The participants then spoke of their work related to ICTs and MSMEs, providing an opportunity to learn about the others' contributions in the area.

See Annex 18 for the event report

Vigneswara Ilavarasan also shared in Colombo, Sri Lanka on 5 December 2016 at JAIC Hilton at an event organized by LIRNEasia and the World Bank. Idah Pswarayi-Riddihough, Country Director of the World Bank in Sri Lanka and the Maldives and Rajendra Singh, Senior Regulatory Specialist at the World Bank made presentations at the event as it also marked the local launch of the World Development Report. Wasantha Deshapriya, Secretary to the Ministry of Telecommunications and Digital Infrastructure and Arul Sivagananathan, Chairman of SLASSCOM were present and engaged in the discussion. It was reported that Deputy Minister Harsha De Silva spoke of the MSME research at a Committee Stage Discussion in December 2016. (See annex 19)

In addition, LIRNEasia organized events at CPRsouth in 2014 and 2016 to share the findings of all three SRs. The preliminary results were shared to practitioners at the earlier event while the challenges of taking research to policy were discussed in the latter (See section 5.1 for more details)

5.3.3 Presentations at conferences and panel discussions

The preliminary results of the three SRs were shared at the ICTD conference on 15 May 2015 in Singapore. The reviews were presented at a panel discussion. The panelists included, Rohan Samarajiva, Sujata Gamage, Erwin Alampay, Vigneswara Ilavarasan, Phet Sayo (IDRC, India) and Anirban Ganguly (DFID, India) and Alison Gillwald (Research ICT Africa). The well-attended session discussed the review findings as well as providing the donor perspective of funding for SRs.

Rohan Samarajiva also presented the results at an invited talk at the Lew Kwan Yew School of Public Policy of the National University of Singapore on 31 August 2015. The session attended by about 50 students and faculty of the public policy school raised questions about the use of evidence in the public policy space.

Helani Galpaya used the results of the SRs at a launch of the World Bank's 2016 World Development Report (focused on the Digital Provide), in Ottawa, Canada at an event organized by IDRC and the Aga Khan Foundation in March 2016.

The SR research provided the basis of evidence at LIRNEasia's presentation made by Helani Galpaya at the 19th session of the UN CSTD (Commission on Science Technology and Development) in Geneva, Switzerland in May 2016.

Findings from the SRs were used in several interventions Helani Galpaya made at the UN-IGF (Internet Governance Forum) in Guadalajara, Mexico in December 2016 as well as the Digital Citizen Summit held in Bangalore, India in November 2016 and organized by the Digital Empowerment Foundation and the Friederich Naumann Foundation.

5.4 Identify gaps in existing literature to inform future research

The gaps identified in the existing literature in the three areas of research varied. The need for further empirical research however, was echoed across the board.

5.4.1 What are the impacts of mobile financial services on low and lower-middle income countries?

All papers discussed in this SR were published after 2011. It appears that Duncombe's & Boateng's (2009) call for more empirical evidence on the impact of m-financial services has been heeded.

However, much remains to be done. Some of the results are positive, but remain inconclusive, justifying further research. There are lacunae in the locations where the studies have been conducted. Most are in Africa, in Kenya in particular. Research on Latin American and Asian m-money deployments are just beginning to come out.

Even from this short list of empirical evidence, some lessons may be learned for future impact assessments. Promising areas of research are development initiatives that incorporate the use of m-money in the design. Notable here are initiatives on conditional cash transfers and payments. Often the conditions may be related to education, health, and agriculture. In such cases, introducing experimental and quasi-experimental designs that also look at identifiable developmental objectives (e.g. health, education, livelihoods) are possible; and perhaps even replicable given the growing popularity of conditional cash transfers in the developing world. Even though the problem of conducting meta-analysis in the development field is challenging because multiple, diverse goals are pursued and are operationalized in different ways, the prospects for aggregating results in m-financial services, as shown in this systematic research are promising.

5.4.2 What are the strategies for training teachers to integrate ICT in the classroom?

The dearth in rigorous studies on use on specific tools was noted. In the future, any research on ICT use in a generic sense should be discouraged and more studies on specific ICT tools should be encouraged. For example, if the technology is specified as, say “one e-book per student provided to all students by the school board,” it is possible to make meaning out of the responses by the teacher to questions on their attitude, acceptance, intention and use in relation to the particular technology intervention.

ICT in education researchers may explore the effect of different variables on technology acceptance and use, but they need to be encouraged situate their findings in the unified theory of technology acceptance (UTTAU) or other well-established theories of change to make their studies more comparable. We were unable to use the bulk of exploratory observational studies because independent variables used were not consistent across the studies. In contrast, where TAM theory was used, the variables were always clustered within the four major variables of Perceived Ease of Use, Perceived usefulness, Social influence and Facilitating conditions. If additional variables are tested, it is the responsibility of the researcher to demonstrate the necessity explicitly.

5.4.3 How does access to business relevant information through networked devices enhance the business growth of urban MSMEs in low and lower-middle income countries?

There is a paucity of studies that follow rigorous methodology and reporting. Methodologies that attempt to unravel causal linkages should be emphasized. This suggests a move away from over-reliance on survey methods. Causal relationships are best captured by the experimental designs (Babbie, 2013). According to Banerjee & Duflo (2009), RCTs reduce the gap between researchers and policy implementers. Systematic reviews and evidence-based summaries are based on RCTs as well. The domain under examination, impact of ICTs on micro enterprises, is likely to gain more credibility if the studies follow more appropriate study designs to capture cause and effect relationships. Rigorous probability sampling techniques should be adopted. Not belittling the efforts made by the research analyzed in this review, it was difficult to scrutinize the methods to increase the generalizability or representativeness of samples. However, it is possible that studies that followed rigorous sampling techniques were excluded because of weak reporting or non-use of inferential statistics.

The studies were predominantly from India and the African continent. Many LMICs had no reported research, despite the wide net that was cast. Studies on understanding the impact of ICTs on MSMEs in these countries would be useful.

Among the ICTs studied, mobile phones were the most common. Some ICTs such as PCs predate mobile phones. Not all business functions can be performed using only mobile phones. Future research can look at the use of other ICTs in a disaggregated manner, and each technology's impact on the internal efficiency and business growth of the MSMEs. Medium-sized enterprises are likely to be using ICTs other than mobile phones.

The relationships between ICTs and economic growth or internal efficiency can be recursive in nature. In other words, increase in business growth could result in investment in ICTs and its use. Except Chew, Levy and Ilavarasan (2011) the examined studies did not test this. The studies have assumed that ICTs are leading to business growth or internal efficiency, which can be questioned. It is necessary to untangle these relationships.

As mentioned earlier, the results are to be shared with other researchers via the peer reviewed EPPI reports and the special issue on SRs in the peer reviewed, open access journal ITID.

6. Methodology

SRs are defined as a summation of best available evidence of a specific research question. SRs use transparent procedures to identify, evaluate and synthesize the results of relevant research.

Procedures are explicitly defined in advance, in order to ensure that the exercise is transparent and can be replicated. This practice is also designed to minimize bias. Studies included in a review are screened for quality, so that the findings of a large number of studies can be combined. Peer review is a key part of the process; qualified independent researchers control the systematic reviewers' methods and results. Currently, the Cochrane Collaboration, the Campbell Collaboration and EPPI-Centre, all based in the United Kingdom, serve as peer reviewers and process auditors.

As in any systematic inquiry, the foundation of a SR is a clear definition of the problem. This takes the form of a research question which is expanded into a set of components described as PICOCS [Population, Intervention, Context, Outcome, Comparison and Study Design] and a theory of change.

PICOCS are the attributes that must be defined at the outset of the study. The research question should clearly indicate the population or the unit of analysis, the intervention and the outcomes expected. The context of interest may or may not be mentioned within the research question itself. The last two items in PICOCS, comparison and study design, determine whether the included studies are amenable to a synthesis of results. Experimental or quasi-experimental study designs are amenable to statistical synthesis or meta-analysis of results. Observational study designs may permit statistical analysis if the intervention is included as dichotomous variable in the data collection.

The PICOCS for the three studies are shown in Table 2. The research question is evident from the PICOCS listed.

Table 2: PICOCs of the three SRs

	Alampay, et al.	Gamage, et al.	Ilavarasan, et al.
Population (or unit of analysis)	Individuals, households and communities	K-12 teachers	Urban MSMEs
Intervention	Use of m-finance services and m-money	Training and support for teachers	Use of networked devices
Context	Low and lower-middle income countries	All countries	Low and middle-income countries
Outcomes	Multiple indicators of financial empowerment	ICT use in the classroom	Internal efficiency and business growth
Comparison	Between intervention/phenomenon and its absence		
Study designs	Experimental or quasi-experimental studies assessing impact Observational studies assessing impact or cause		

Upon the approval of the protocol, the teams began working on their search strategies and electronic searches with the aid of an information scientist. The search strategies used by each review team is given in annex 20. The review teams are used the software “EPPI Reviewer” as a reference management system. In addition to the electronic searches obtained above, each of the teams also looked through the institutional websites and other search engines to search for grey literature to minimize any potential biases.

Each review team conducted a minimum of three screenings (title and abstract; detailed abstract; full text), based on the inclusion criteria adopted by each of the reviews. Papers were assessed for possible risks of bias and quality of research design. These are detailed in the research findings section. During the third round of the screening or immediately afterwards, all remaining papers were subject to a critical appraisal. The process of filtering papers from search to synthesis is shown in figures 1, 2 and 3.

Studies that made it through the critical appraisal stage were then included in the final synthesis of the report. For the quantitative synthesis, the group extracted effect size estimates, calculating standard errors and 95 per cent confidence intervals using data provided in the studies.

The latest versions of the reports can be found in annexes 13, 14 and 15.

The three SRs that were conducted have received its comments and have undergone revisions. The SRs have been sent for copyediting, then publishing.

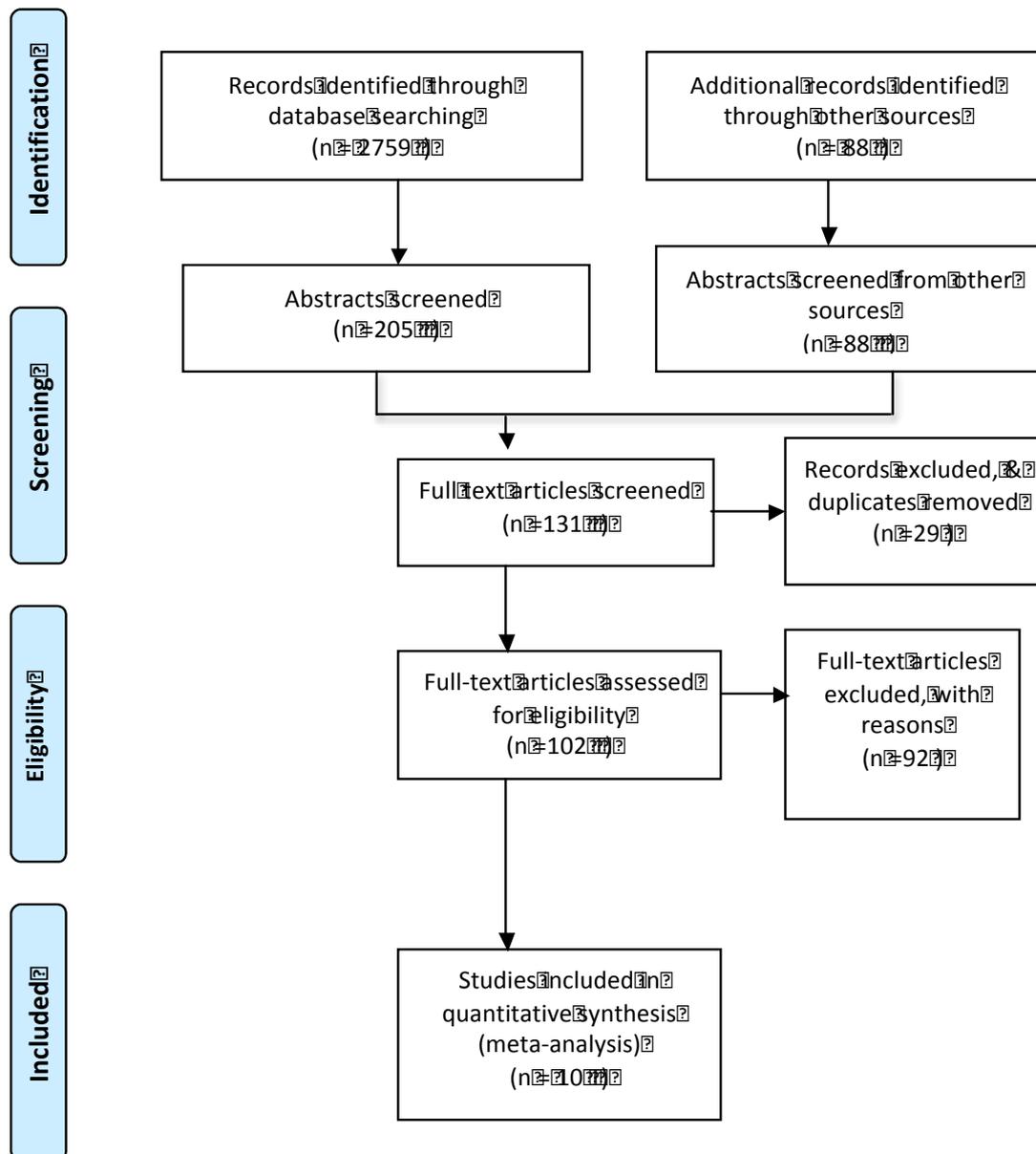


Figure 1: M-financial services: Filtering process from search to synthesis

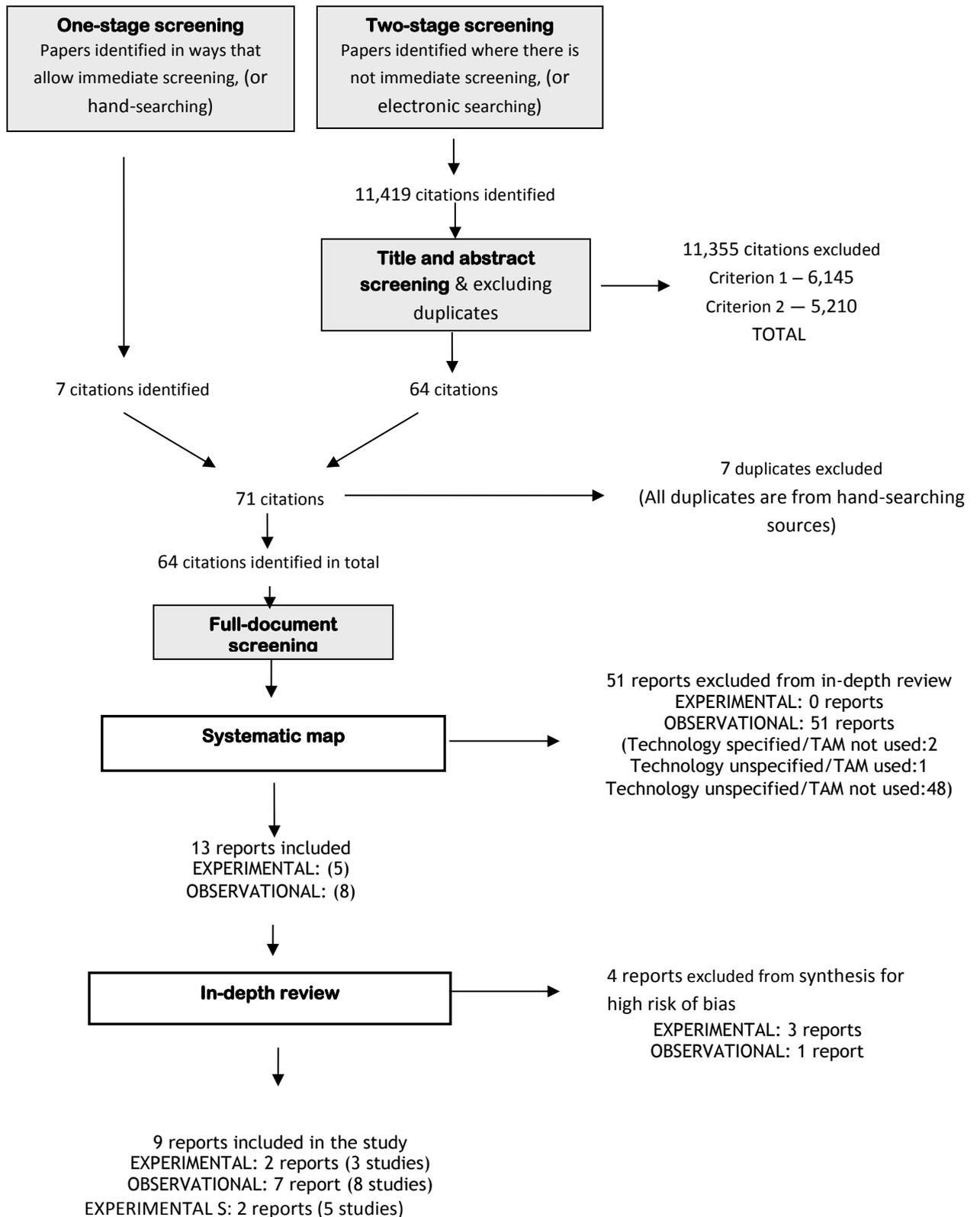


Figure 2: Education: Filtering process from search to synthesis

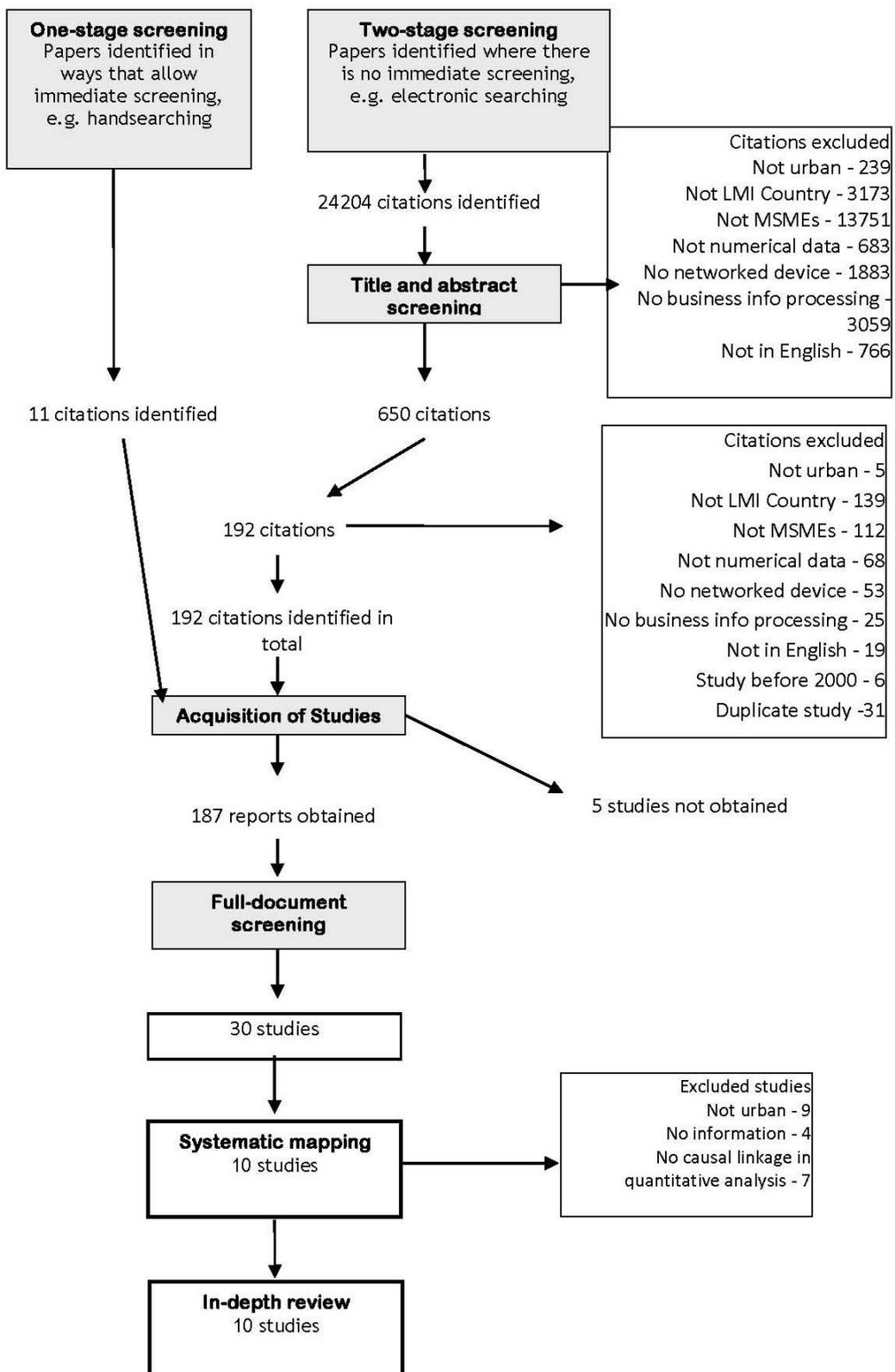


Figure 3: MSME: Filtering process from search to synthesis

7. Project Outputs

Table 3: Outputs

Output type	Description	Status
Research report	Report on strategies to train teachers to integrate ICTs in the classroom. (See annex 14)	SR complete and sent for publication. Due to be published in the first quarter of 2017.
Research report	Report on the impact of mobile financial services in LMICs. (See annex 13)	SR complete and in the final stages of peer review. Due to be published in the first quarter of 2017.
Research report	Report on access to business relevant information through networked devices in urban MSMEs in LMICs. (See annex 15)	SR complete and in the final stages of peer review. Due to be published in the first quarter of 2017.
Policy influence	LIRNEasia's research on networked devices in urban MSMEs in LMICs was cited in a Parliamentary debate in Sri Lanka. The policy brief was also tabled in Parliament. The hansard can be accessed here and on annex 21)	Research cited and policy brief tabled on 9 December 2016.
Publication	A Special Issue on SRs in ITID, a peer reviewed, open access journal has been negotiated. The 3 SRs, a previously conducted SR and an introductory chapter are to be published.	The papers have been sent to the reviewers for peer review. Expected to be published in 2017.
LIRNEasia organized dissemination event	A dissemination event to share results of the SR on strategies to train teachers to integrate ICTs in the classroom with Government, NGOs and industry in Colombo, Sri Lanka. (See annex 17)	Held on 26 November 2015
LIRNEasia organized dissemination event	A dissemination event to share results of the SR on networked devices in urban MSMEs in LMICs in Delhi, India. Attendees were from academia, NGOs and private sector (See 16)	Held on 26 April 2016
LIRNEasia organized dissemination event	A dissemination event to share results of the SR on the impact of mobile financial services in LMICs. with local government and NGOs in Manila, Philippines (See annex 18)	Held on 15 June 2016
LIRNEasia organized dissemination event	A dissemination event to share results of networked devices in urban MSMEs in LMICs. Attendees were from Government, NGOs, the private sector and media in Colombo, Sri Lanka (See annex 19)	Held on 7 December 2016

Capacity building program	Focus at young scholar tutorial program for 28 young scholars from developing Asia and Africa in Johannesburg, South Africa. (See annex 11)	Held in September 2014
Capacity building program	Results of SRs, difficulties in carrying them out and policy implications discussed at an event with 58 participants from 24 countries in Zanzibar, Tanzania. (See annex 12)	Held in September 2016
Media coverage	Results of SR on strategies to train teachers to integrate ICTs in the classroom. Can tabs do what PCs or bricks could not do for education?	Published on 16 November 2015 in the Sunday Times, Sri Lanka.
Media coverage	Results of SR on access to business relevant information through networked devices in urban MSMEs in LMICs. ICT has become critical factor in empowering MSMEs in the developing world: LIRNEasia	Published on 2 May 2016 in DQ India
Media coverage	Results of SR on access to business relevant information through networked devices in urban MSMEs in LMICs Tax On Internet Data Should Be Reduced – Deputy Minister Harsha De Silva	Published on 9 December 2016 in LankacNews
Blog post	LIRNEasia systematic review research showcased at ICTD 2015	Published on 15 May 2015
Blog post	Findings of Systematic Review on ICTs in classroom shared with decision makers	Published on 29 November 2015
Blog post	Findings of Systematic Review on MSMEs shared	Published on 5 February 2016
Blog post	Writing workshop for Special Issue on Systematic Reviews	Published on 19 March 2016
Blog post	What can we learn from Systematic Reviews for the advancement of MSMEs?	Published on 28 April 2016
Blog post	“I finally understood what Systematic Reviews are about”	Published on 19 September 2016
Blog post	Systematic Reviews: How do we communicate results when there is little demand from policy makers	Published on 19 September 2016

8. Problems and Challenges

Three diffused teams situated across Asia, Africa and North America conducted the SRs. The teams met twice during the training sessions and conducted the reviews remotely. The team leaders (Erwin Alampay, Sujata Gamage and Vigneswara Illavarasan) were responsible for the completion of the reviews. They received guidance from Nilusha Kapugama (Senior Research Manager, LIRNEasia) who had previously worked on a SR. All team members, including the team leaders, were novice systematic reviewers. This, coupled with the requirement to work remotely, added to the complexity of the project. Team leaders often found it difficult to get all of their team members together at the same time for meetings. This meant that the team leaders often had to conduct one-on-one meetings with team members. Having a platform such as EPPI Reviewer made it easy to coordinate and monitor the progress and the quality of the work as it was being completed.

Among the other difficulties that the team leaders faced was the lack of interest in the particular subject area by some of the team members, particularly the junior researchers. This was in spite of the care taken during the team formation stage to select only those with a declared interest in the subject area. It's possible the sometimes tedious nature of work involved in the early stages of the SR, specifically the stage of Abstract Review (where sometimes multiple thousand/tens of thousands of abstracts are being systematically read and included or excluded) contributes this lack of enthusiasm. The SR team members were assigned tasks throughout the review process. These tasks had to be fulfilled at particular intervals. However, all review members had a primary affiliation with another organization. This meant that some of the team members could not complete some of their assigned tasks due to their regular work commitments and other team members were required to pick up the slack when needed.

As mentioned above, all review team members were novice reviewers. SRs by nature are methods intensive. As such, all 20 team members received a considerable amount of capacity building with regards to the research methods, particularly those that were involved in the critical appraisal stage. The three statisticians received extensive training on statistical methods and synthesis throughout the review process. Two of the statisticians were competent to begin with while the third required more training during the review process.

Taking research to policy in an effective manner requires understanding and exploiting policy windows. Some windows are predictable (e.g., a new decision makers assuming office after an election) and others are not (e.g., a crisis). Given the time required to complete a SR, including peer reviews of the protocol and final results, it is clear that the work cannot begin during the period that the policy window is open. It has to have been commenced, if not concluded, before the opening of the window. Time is required to raise the necessary funds and assemble teams.

There are two additional problems. Research becomes stale, because of events as well as because of advances in theory and research methodology. A SR where the most recent primary study is several years old may cause a decision-maker to decline to pay attention on the grounds of obsolescence. A glance at the reference lists will illustrate the problem. A policy maker being presented with the SR in 2017 may think that much has happened in m-financial services since 2014, the publication year of the most recent papers included in Alampay & Moshi (2017). It is of course possible to explain the inherent lag caused by the need to conduct rigorous reviews and so on, but in the policy world one rarely gets to reopen a door that has once been shut.

The second problem is the possible lack of contextualization. When it comes to policy-relevant knowledge, context matters. If systematic reviews in the stockpile lack country context, it is easier to

use them in multiple countries where policy windows may open up. But in each case, it will be sub-optimal because the bridge between the conditions specific to the policy window is missing. In some instances, decision makers capable of influencing policy and practice are resistant to make time to listen to the findings of SRs that appear to be based on work done in far-away countries. All 10 studies that were included in Alampay & Moshi (2017) were African and six of them were from Kenya. None were from Asia. This proved a barrier to efforts to disseminate the findings in Bangladesh, a large Asian country where m-financial services have grown fast in a short time. Bridging studies, which give country specific context, may be needed. When the SR on MSMEs was disseminated in Sri Lanka, some country specific context was given.

9. Administrative Reflections and Recommendations

The LIRNEasia tea did not face any administration (in relation to IDRC) issues during this project. T